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## Chemical Weapons and their Unforeseen Impact on Health and the Environment

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### Cover Page Footnote

Alexandra Chen is a law student at Seattle University School of Law and was an active voice in the racial justice protests of 2020. As a named plaintiff in the Black Lives Matter v. City of Seattle case discussed in this article, many of the issues discussed herein are of special importance to her. She would like to thank the tireless editors and staff of SJTEIL who have been dedicated to publishing this article.

# Chemical Weapons and their Unforeseen Impact on Health and the Environment

Alexandra Chen\*

## I. INTRODUCTION

Following the murder of George Floyd, the United States became embroiled in growing awareness about systemic racism in its criminal justice system.<sup>1</sup> Citizens across the country took over streets to protest police brutality against people of color. They were met not with governmental understanding and condemnation of the policies that led to Mr. Floyd's murder, but with tear gas and pepper spray.<sup>2</sup> Unfortunately, this is far from the first time that U.S. law enforcement agencies have attacked masses of people with chemical agents.<sup>3</sup> In addition to many other racial justice-related protests, law enforcement used tear gas on Vietnam War protesters, the World Trade Organization protesters, and the Occupy protesters.<sup>4</sup> Law enforcement officers have commonly and freely used pepper spray since the 1990s, including as a crowd control agent.<sup>5</sup>

Unregulated use of chemical weapons resulted in both dependency and abuse by law enforcement, particularly when law enforcement has aimed those weapons at peaceful protesters. To prevent continuing harm from exposure to chemical weapons by people and the environment, the federal government should enact policies under the Spending Clause to regulate the domestic use of indiscriminate chemical weapons by law enforcement. Local law enforcement's failure to comply

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<sup>1</sup> Elliott McLaughlin, *How George Floyd's Death Ignited a Racial Reckoning That Shows No Signs of Slowing Down*, CNN (Aug. 9, 2020), <https://www.cnn.com/2020/08/09/us/george-floyd-protests-different-why/index.html> [https://perma.cc/LAL2-XSP6].

<sup>2</sup> Shaila Dewan & Mike Baker, *Facing Protests Over Use of Force, Police Respond With More Force*, NY TIMES (May 31, 2020), <https://www.nytimes.com/2020/05/31/us/police-tactics-floyd-protests.html> [https://perma.cc/L5JF-NJ27].

<sup>3</sup> Anna Feigenbaum, *100 Years of Tear Gas: A Chemical Weapon Drifts Off The Battlefield And Into The Streets*, THE ATLANTIC (Aug. 16, 2014), <https://www.theatlantic.com/international/archive/2014/08/100-years-of-tear-gas/378632/> [https://perma.cc/USV4-CUWV].

<sup>4</sup> *Id.*

<sup>5</sup> Brandon Keim, *Why Do Police Officers Use Pepper Spray?*, WIRED (Nov. 22, 2011, 7:23 PM), <https://www.wired.com/2011/11/pepper-spray-psychology/> [https://perma.cc/N5Z3-WHPZ].

with federal regulations on the use of chemical weapons should cause the state to lose a portion of federal funding typically allotted for local law enforcement agencies. In addition, the federal government should pass laws under the Commerce Clause to regulate the chemical weapons industry to prevent manufacturers from including harmful chemicals in their products.

The proposed action under the Spending Clause is analogous to Congress' conditional funding to states by enforcement of the National Minimum Drinking Age Act (the NMDA Act) of 1984. The federal government, in response to a surge of drunk driving incidents in the 1980s, set the national drinking age to twenty-one and conditioned the receipt of federal highway funding on states upholding that drinking age limit.<sup>6</sup> Any state allowing persons under the age of twenty-one to purchase alcohol will not receive its allotted federal highway funds.<sup>7</sup> Just as the government responded to an uptick in drunk driving accidents by passing the NMDA Act in 1984, so too should it respond to the ever-increasing use of tear gas by law enforcement against peaceful protesters.<sup>8</sup>

As U.S. residents continue to advocate for social change, the federal government must ensure the protection of their First Amendment right to protest. The Geneva Convention of 1925 banned the use of tear gas on the battlefield against enemy combatants; it follows that there is likewise no place for it against civilian protesters at home.<sup>9</sup> Federal intervention would incentivize states to protect protesters from tear gas without instituting a complete ban on the national level.

States should also mandate transparency and accountability in local law enforcement's deployment of targeted chemical weapons such as pepper spray. Because law enforcement deploys pepper spray in a focused manner (rather than being utilized in grenade form, they more commonly use it as a handheld aerosol spray), its environmental effect and indiscriminate impact on vulnerable groups is less severe.<sup>10</sup> Therefore, it is more appropriate to leave its regulation to the states rather than a fully instituted ban.

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<sup>6</sup> *The 1984 National Minimum Drinking Age Act*, ALCOHOL POLICY INFORMATION SYSTEM <https://alcoholpolicy.niaaa.nih.gov/the-1984-national-minimum-drinking-age-act> [https://perma.cc/RBY4-W8FV] (last accessed Nov. 23, 2020). *See also* Denali Tietjen, *Why 21? A Look At Our Nation's Drinking Age*, BOSTON (July 17, 2014), <https://www.boston.com/culture/health/2014/07/17/why-21-a-look-at-our-nations-drinking-age> [https://perma.cc/MH66-MDBW].

<sup>7</sup> *Id.*

<sup>8</sup> Tietjen, *supra* note 6. In Portland alone, tear gas was used 96 times between May 29, 2020, and July 4, 2020. Tess Riski, *Portland Police Used Tear Gas Nearly 100 Times Since May, According to Portland State University Analysis*, WILLAMETTE WEEK (Aug. 3, 2020), <https://www.wweek.com/news/city/2020/08/02/portland-police-used-tear-gas-nearly-100-times-since-may-according-to-portland-state-university-analysis/> [https://perma.cc/GV8W-2ERM]. *See also* Mark Sauer & Pat Finn, *Recent Police Use Of Tear Gas Widespread In US, Including San Diego*, KPBS (June 17, 2020), <https://www.kpbs.org/news/2020/jun/17/recent-police-use-tear-gas-widespread-us-including/> [https://perma.cc/5RHU-Q2KB] (reporting that police in at least 98 cities had used tear gas against people protesting police brutality and racism in the spring of 2020).

<sup>9</sup> Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, June 17, 1925, 26 U.S.T. 571 [hereinafter Geneva Protocol].

<sup>10</sup> Jaime Smith, *What Is Pepper Spray and Is It Dangerous?*, MEDICAL NEWS TODAY (Oct. 15, 2020), <https://www.medicalnewstoday.com/articles/238262> [https://perma.cc/3MXA-PLJH].

Regulating the manufacture of tear gas and other chemical weapons by private companies and the manner of their use by police in the U.S. is important for several reasons. First, regulating companies that produce chemical weapons containing toxic materials will protect U.S. residents from exposure to unforeseen health hazards. Federal regulation of private companies is not hindered by the constitutional concerns that follow attempts by the federal government to regulate the individual States. Second, providing police departments nationwide uniform guidance on chemical weapons usage will allow protesters to know which behaviors may subject them to police action and make informed decisions about their health risks when protesting. Third, regulation will prevent collateral damage to the environment caused by excessive use of chemical weapons without attending cleanup.

If the U.S. continues to allow law enforcement carte blanche in their use of chemical weapons, all its citizens will bear the health and environmental costs of its use. Even people who did not protest are at risk of having tear gas seep into their water supply and drift into their homes.<sup>11</sup> To prevent this from happening, the private manufacture of chemical weapons and their use by police departments must be regulated.

Very few studies have looked at the long-term effects of chemical weapons on human health and the environment. Despite the serious health and environmental effects of tear gas and pepper spray, the U.S. has not regulated the manufacture and use of these products, leaving the industry “to regulate itself.”<sup>12</sup> Within this regulatory vacuum, law enforcement agencies across the U.S. continue to use chemical weapons against the public at their discretion, without concerns for the health and welfare of civilians. Similarly, manufacturers will continue to include hazardous chemicals in their products. Federal regulations on their development and use are necessary to better protect the public and the environment from the unknown and accumulative dangers of exposure to chemical weapons.

This paper will examine how a lack of comprehensive regulation on the use of chemical weapons by law enforcement has placed human health and the environment at risk of the weapons’ negative side effects. The history of use and development of chemical weapons is assessed for context before shifting to an explanation of the commonly included chemical agents that harm human health and the environment. This section explores the Environmental Protection Agency (EPA)’s role in regulating the chemical components of these weapons. Then, the paper will examine the circumstances of the current use of chemical weapons, including discussions of several cases stemming from their misuse by police. The analysis will then compare unsuccessful propositions for federal legislation surrounding the use of chemical weapons to successful attempts at regulation in local jurisdictions. To conclude, the paper

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<sup>11</sup> See Yessenia Funes, *The Unknown Environmental Legacy of Tear Gas*, ATMOS (Sep. 25, 2020), <https://atmos.earth/tear-gas-protests-environmental-legacy-impacts/> [https://perma.cc/X5JT-4VGT].

<sup>12</sup> Andrew Selsky, *Lack of Study and Oversight Raises Concerns About Tear Gas*, THE ASSOCIATED PRESS (Aug. 5, 2020), <https://www.pbs.org/newshour/politics/lack-of-study-and-oversight-raises-concerns-about-tear-gas> [https://perma.cc/RG6K-853A].

provides an accounting of physical and theoretical innovations in policing and suggestions for future reform.

## II. BACKGROUND

### A. History of Chemical Weapons Development

Prior to its modern-day use as a domestic crowd control agent, nations developed various types of tear gas as wartime weapons.<sup>13</sup> Since its first deployment in World War I, militaries commonly used tear gas in conflicts due to its high efficacy at low concentrations compared to other more lethal gases.<sup>14</sup>

Despite restrictions on wartime use of chemical weapons put forth in the Geneva Protocol of 1925, the United States developed the manufacture of tear gas into an industry.<sup>15</sup> Beginning in the 1920s, former officers of the U.S. Army's Chemical Warfare Service (CWS), previously tasked with developing chemical agents for war, utilized their wartime knowledge and skills to establish tear gas manufacturing companies in the U.S.<sup>16</sup> Military veterans who went into the police force lobbied for the police to use tear gas to put down civilian protests, with one request specifically mentioning that tear gas would be "effective in subduing black people."<sup>17</sup> The CWS's marketing strategy to appeal to law enforcement was a great success, and tear gas was introduced to the public consciousness by its frequent use in the Labor Movement of the 1930s.<sup>18</sup> Tear gas has since been a mainstay of the police's response to civil unrest.<sup>19</sup> Today, the most common type of tear gas used against civilians in the U.S. is 2-chlorobenzalmalononitrile, although 2-chloroacetophenone is also sometimes used.<sup>20</sup> Gases containing either ingredient are referred to by the term "CS gas."

Another chemical agent commonly used by police against civilians is pepper spray. The pepper spray now used by law enforcement was initially developed and marketed in the mid-1960s as a self-defense tool for women under the name Chemical Mace.<sup>21</sup> The military described

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<sup>13</sup> Feigenbaum, *supra* note 3.

<sup>14</sup> Aaron Mak, *The Charged Vapor*, SLATE MAGAZINE (June 1, 2020), <https://slate.com/business/2020/06/tear-gas-police-wwi-george-floyd.html> [<https://perma.cc/AUZ4-SCMX>].

<sup>15</sup> Geneva Protocol, *supra* note 9.

<sup>16</sup> Mak, *supra* note 14.

<sup>17</sup> *Id.* See also Al Mauroni, *The U.S. Army Chemical Corps: Past, Present, and Future*, NAT'L MUSEUM U.S. ARMY, <https://armyhistory.org/the-u-s-army-chemical-corps-past-present-and-future/> [<https://perma.cc/6ZKN-NXDK>] (last visited Feb. 4, 2021).

<sup>18</sup> Jen Kirby, *The Disturbing History of How Tear Gas Became The Weapon of Choice Against Protesters*, VOX (Jun. 3, 2020 8:50 AM), <https://www.vox.com/2020/6/3/21277995/police-tear-gas-protests-history-effects-violence> [<https://perma.cc/G4RR-ZUZ6>].

<sup>19</sup> Mak, *supra* note 14.

<sup>20</sup> Angus Chen, *How Tear Gas Works: A Rundown of the Chemicals Used on Crowds*, SCIENTIFIC AMERICAN (Nov. 29, 2018), <https://www.scientificamerican.com/article/how-tear-gas-works-a-rundown-of-the-chemicals-used-on-crowds/> [<https://perma.cc/DD9V-PH7J>].

<sup>21</sup> Daniel Gross, *The Forgotten History of Mace, Designed by a 29-Year-Old and Reinvented as a Police Weapon*, SMITHSONIAN MAGAZINE (Nov. 4, 2014), <https://www.smithsonianmag.com/history/forgotten-history-mace-designed-29-year-old-and-reinvented-police-weapon-180953239/> [<https://perma.cc/VP4Q-7WJE>].

the chemicals present in the first iteration of Chemical Mace as a potent tear gas.<sup>22</sup> Its inventor, Alan Litman, successfully repurposed a military product as a civilian tool by packaging potent tear gas into a pocket-sized aerosol spray.<sup>23</sup> Law enforcement quickly adopted this defensive product as a new crowd control method.<sup>24</sup> Shortly thereafter, in the tumultuous Civil Rights era, the use of handheld mace sprays became both the target of harsh criticism and a ubiquitous tool used by police departments across the country.<sup>25</sup> Today, the active ingredient in most of the pepper sprays used by law enforcement is oleoresin capsicum (OC), a highly concentrated derivative of the chili pepper.<sup>26</sup>

### B. Physical Effects

The relatively innocuous-sounding moniker “tear gas” sometimes leads to the incorrect belief that the effects of exposure are like a person’s eyes watering as when cutting an onion; however, exposure to tear gas is much more threatening. The main symptoms of short-term tear gas exposure are intense stinging and burning of the eyes, impaired vision, coughing and breathing difficulties, nausea and vomiting, and burns or rashes on the skin.<sup>27</sup> Long-term exposure can cause blindness or glaucoma, and death as a result of respiratory failure or chemical burns to the lungs.<sup>28</sup> The Centers for Disease Control and Prevention (CDC) recommends that people exposed to tear gas leave the affected area immediately and either blow the particulates off of their clothes and skin or to rinse the affected areas with tepid water for at least fifteen minutes.<sup>29</sup>

Similarly, exposure to pepper spray is far more intense than eating a spicy pepper. On the Scoville scale used to measure spiciness, a jalapeño scores 2,500–8,000 SHU, while the pepper spray that most law enforcement officers use is 2–5.3 million SHU.<sup>30</sup> Pepper spray can cause severe irritation of the eyes, skin, and mucous membranes, resulting in temporary blindness, cough and shortness of breath, chest pain, and skin rashes, blisters, or burns.<sup>31</sup>

### C. Harm to Environment and Health

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<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Pepper Spray Frequently Asked Questions*, SABRE SECURITY EQUIPMENT CORP., <https://www.sabrered.com/pepper-spray-frequently-asked-questions-0> [<https://perma.cc/L3R3-LUCM>] (last accessed Nov. 23, 2020).

<sup>27</sup> *Facts About Riot Control Agents Interim Document*, CENTERS FOR DISEASE CONTROL AND PREVENTION (Apr. 4, 2018), <https://emergency.cdc.gov/agent/riotcontrol/factsheet.asp> [<https://perma.cc/97MR-RHUX>].

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> Matt Bray, *Jalapeño Peppers 101: Your Complete Guide*, PEPPERSCALE (Nov. 1, 2020), <https://www.pepperscale.com/jalapeno-peppers/> [<https://perma.cc/6AQG-88WP>]. Matt Bray, *Pepper Spray: Pepper As A Protector*, PEPPERSCALE (Oct. 11, 2020), <https://www.pepperscale.com/pepper-spray/#:~:text=Typical%20pepper%20spray%20will%20land,strength%20of%20a%20habanero%20pepper> [<https://perma.cc/4ETW-4AZW>].

<sup>31</sup> Smith, *supra* note 10.



One of the major concerns surrounding the use of chemical weapons for domestic law enforcement purposes is the lack of knowledge of its potentially harmful long-term effects. International law bans the chemical weapons used against American residents in warfare. Additionally, researchers have studied these weapons only on small groups of volunteers under controlled conditions; they have little information on the effects of tear gas exposure on women, children, the elderly, or those with preexisting conditions.<sup>32</sup> No one discloses the exact effects of chemical weapons to the public, and police departments are notoriously vague about which specific chemicals are being deployed against crowds.<sup>33</sup> In June 2020, the Trump administration famously denied that the federal government used tear gas to clear peaceful protestors for a photoshoot, claiming instead that they had used “smoke canisters.”<sup>34</sup> In fact, the government used OC gas canisters—a grenade version of pepper spray—rather than CS gas canisters.<sup>35</sup>

Elected officials, usually in a position to uncover information not available to the general public, also face challenges in acquiring full disclosure following the use of chemical weapons. On July 14, 2020, U.S. Senator Ron Wyden (D-OR) sent a letter to the Department of Homeland Security (DHS) inquiring about health concerns surrounding the use of undisclosed chemical weapons in Portland, Oregon.<sup>36</sup> Senator Wyden sent a follow-up letter on August 20, 2020.<sup>37</sup> These concerns followed the discovery of high levels of cyanide and heavy metals near places that experienced heavy deployment of chemical weapons during the 2020 racial justice protests.<sup>38</sup> Following a period of no response from the DHS, Senator Wyden sent another follow-up letter on June 9, 2021.<sup>39</sup> As of October 3, 2021, the DHS has not made a public response.

On March 15, 2021, following concerns about tear gas residue on school playgrounds, the Multnomah County Board of Commissioners sent

<sup>32</sup> Craig Rothenberg, et al., *Tear Gas: An Epidemiological and Mechanistic Reassessment*, ANNALS OF THE N.Y. ACAD. OF SCI., (Aug 2016), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5096012/> [<https://perma.cc/4HTA-JR2T>].

<sup>33</sup> See Philip Bump, *A Reverse Fact-Check From Trump And His Supporters About ‘Tear Gas’ Falls Apart*, THE WASHINGTON POST (June 5, 2020 1:46 PM), <https://www.washingtonpost.com/politics/2020/06/05/reverse-fact-check-trump-his-supporters-about-tear-gas-falls-apart/> [<https://perma.cc/ZG86-JY92>].

<sup>34</sup> Abigail Hauslohner, William Wan, & Nick Miroff, *White House Says Police Didn’t Use Tear Gas And Rubber Bullets In Incident That Cleared Protesters With Chemical Irritants And Projectile Munitions: The Truth About What Was Deployed On Lafayette Square Protesters To Make Way For The President’s Photo Op Boils Down To An Exercise In Semantics*, THE WASHINGTON POST, (June 3, 2020), [https://www.washingtonpost.com/lifestyle/media/trump-demands-journalists-correct-stories-on-the-use-of-tear-gas-according-to-the-cdc-it-was-tear-gas/2020/06/02/bf68726c-a544-11ea-bb20-ebf0921f3bbd\\_story.html](https://www.washingtonpost.com/lifestyle/media/trump-demands-journalists-correct-stories-on-the-use-of-tear-gas-according-to-the-cdc-it-was-tear-gas/2020/06/02/bf68726c-a544-11ea-bb20-ebf0921f3bbd_story.html) [<https://perma.cc/AV8C-U52A>].

<sup>35</sup> *Id.*

<sup>36</sup> Letter from Ron Wyden to William Barr & Chad Wolf, (July 14, 2020), <https://blumenauer.house.gov/sites/blumenauer.house.gov/files/071420%20Wyden%20Merkley%20Blumenauer%20Bonamici%20Letter%20to%20DOJ%20DHS%20Re%20Feds%20Response%20in%20Portland%20Protests.pdf>.

<sup>37</sup> Letter from Ron Wyden to William Barr & Chad Wolf, (August 5, 2020), <https://www.wyden.senate.gov/imo/media/doc/080620%20Wyden%20tear%20gas%20letter%20to%20Barr%20and%20Wolf.pdf>.

<sup>38</sup> *Id.*

<sup>39</sup> Letter from Ron Wyden to the Attorney General, <https://int.nyt.com/data/documenttools/wyden-letter-to-dhs/2ab24bca29ba3108/full.pdf>.



a letter to the Secretary of Homeland Security requesting that the use of tear gas near residential neighborhoods and schools be prohibited.<sup>40</sup> Again, as of October 3, 2021, no response to the Commissioner's request has been made public. These futile efforts to obtain information on chemical weapons further underscore the need for regulation.

No regulatory body oversees the use or manufacture of chemical weapons in the U.S.<sup>41</sup> Warnings on a manufacturer's website state that CS gas contains chemicals known to cause cancer and birth defects.<sup>42</sup> However, that information is not widely shared with the public. On the contrary, governmental agencies such as the CDC tell the public that the effects are only irritating and temporary.<sup>43</sup> The director of the National Tactical Officers Association claimed that even if a police department deployed its entire arsenal of tear gas at once, nobody would be killed or seriously injured.<sup>44</sup> However, no scientific research supports this claim. Protesters have come forward with first-hand accounts of continuing ill effects suffered following exposure to chemical weapons; their experiences stand in contrast to the National Tactical Offices Association director's claims.<sup>45</sup>

In addition to the deleterious effect on the human body, chemical weapons have unexplored effects on the environment. The chemicals used in tear gases are considered hazardous waste by regulatory agencies such as the EPA, which defines hazardous waste as having "properties that make it dangerous or capable of having a harmful effect on human health or the environment."<sup>46</sup> The wider effects of highly concentrated pepper sprays have not been studied.<sup>47</sup> The use of chemical weapons results in the uncontrolled introduction of hazardous waste into soil, waterways, public spaces, and private homes.<sup>48</sup>

The CDC's guidelines for detoxification recommend that those exposed to tear gas remove and double bag their clothes for disposal by the "health department or emergency personnel" and seek immediate medical attention.<sup>49</sup> Despite the meticulous recommendations in place for individuals, physical spaces exposed to chemical weapons are not afforded any attention from federal regulatory bodies such as the EPA.<sup>50</sup>

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<sup>40</sup> *Board Of Commissioners Ask Homeland Security To Stop Using Tear Gas Near Schools, Neighborhoods*, MULTNOMAH COUNTY, (March 16, 2021), <https://multco.us/multnomah-county/news/board-commissioners-ask-homeland-security-stop-using-tear-gas-near-schools> [https://perma.cc/5FXH-KYPU].

<sup>41</sup> Selsky, *supra* note 12.

<sup>42</sup> See, e.g., *Prop 65 Warning, Triple-Chaser® Separating Canister, CS, DEFENSE TECHNOLOGY*, <https://www.defense-technology.com/product/triple-chaser-separating-canister-cs/> [https://perma.cc/QP9F-STEK] (last visited Nov. 24, 2020).

<sup>43</sup> *Facts About Riot Control Agents Interim Document*, *supra* note 27.

<sup>44</sup> Selsky, *supra* note 13.

<sup>45</sup> *Id.*

<sup>46</sup> *Learn the Basics of Hazardous Waste*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/hw/learn-basics-hazardous-waste> [https://perma.cc/MR57-FGXJ] (last accessed Dec. 3, 2021). See also Kirby, *supra* note 18.

<sup>47</sup> Selsky, *supra* note 12.

<sup>48</sup> Kirby, *supra* note 18.

<sup>49</sup> *Facts About Riot Control Agents Interim Document*, *supra* note 27.

<sup>50</sup> Selsky, *supra* note 12.

### III. EPA REGULATIONS

The EPA issues various regulations to monitor and control different environmental hazards, such as chemicals that cause air and water pollution.<sup>51</sup> While it does not have the power to create laws on its own, the EPA can create regulations to enforce existing laws.<sup>52</sup> In this way, Congress's laws define the scope of what the EPA can regulate. One of the pieces of legislation that gives the EPA the ability to regulate is the Toxic Substances Control Act (TSCA). The TSCA gives the EPA "authority to require reporting, record-keeping, and testing requirements, and restrictions relating to chemical substances and/or mixtures."<sup>53</sup> Tear gas, a combination of chemicals that does not occur in nature and is not the result of a chemical reaction, is considered a mixture as defined in section 710.2(q) of the TSCA.<sup>54</sup> The EPA may only require tear gas manufacturers to conduct testing to determine the health effects of the gas under the following conditions: 1) the mixture may present an unreasonable risk of injury to health or the environment, 2) the mixture will enter the environment in large quantities or result in significant human exposure, 3) insufficient data exists to predict the mixture's effects on health and the environment, and 4) testing is necessary to obtain the data.<sup>55</sup> Even if the testing requirements are met, the problem remains that the regulations would put the tear gas manufacturers in the position of testing the safety of their own product.

Another regulation that could impact the manufacture of tear gas, The Resource Conservation and Recovery Act (RCRA), regulates the disposal of solid and toxic waste.<sup>56</sup> However, tear gas is manufactured and sold as a commodity, and private manufacturers do not consider their product to be "waste"; in this way, companies may use a lack of intent to discard as a defense to the RCRA.<sup>57</sup>

The EPA does not regulate OC.<sup>58</sup> Manufacturers do not typically format pepper spray to include other hazardous chemicals, nor does the EPA expect OC to have a discernible negative impact on the

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<sup>51</sup> *Our Mission and What We Do*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/aboutepa/our-mission-and-what-we-do> [<https://perma.cc/TDN3-VEBY>] (last accessed Nov. 25, 2020).

<sup>52</sup> *Id.*

<sup>53</sup> *Summary of the Toxic Substances Control Act*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act> [<https://perma.cc/SZ9V-V45Y>] (last accessed Dec. 3, 2021).

<sup>54</sup> *Toxic Substances Control Act Inventory Representation For Products Containing Two Or More Substances: Formulated And Statutory Mixtures*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/sites/default/files/2015-05/documents/mixtures.pdf> [<https://perma.cc/489A-S748>] (last accessed Dec. 3, 2021).

<sup>55</sup> *Toxic Substances Control Act (TSCA) and Federal Facilities*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/enforcement/toxic-substances-control-act-tsca-and-federal-facilities> [<https://perma.cc/T27U-8NEL>] (last accessed Dec. 3, 2021).

<sup>56</sup> *Resource Conservation and Recovery Act (RCRA) Overview*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview> [<https://perma.cc/R6E6-6WVM>] (last accessed Dec. 3, 2021).

<sup>57</sup> Erin Guffey, *RCRA Liability: Not Strict in Application*, AMERICAN BAR ASSOCIATION Jan. 1, 2014 [https://www.americanbar.org/groups/environment\\_energy\\_resources/publications/natural\\_resources\\_environment/2013-14/winter-2014/rcra\\_liability\\_not\\_strict\\_application/](https://www.americanbar.org/groups/environment_energy_resources/publications/natural_resources_environment/2013-14/winter-2014/rcra_liability_not_strict_application/).

<sup>58</sup> *Chemicals and Toxics Topics*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/environmental-topics/chemicals-and-toxics-topics> [<https://perma.cc/JUQ6-ZDXV>] (last accessed April 14, 2021).

environment.<sup>59</sup> While medical researchers, federal regulatory agencies, and other scientific studies have been questioned about the safety of tear gas, manufacturers claim that it does not contain chemicals known to be harmful to the environment.<sup>60</sup> Although studies on the long-term health and environmental impact of OC would benefit future generations, the immediate threat to the environment by chemical weapons comes from the use of tear gas.

The EPA does not regulate either 2-chlorobenzalmalononitrile or 2-chloroacetophenone, which are not listed in the TSCA Inventory.<sup>61</sup> However, the EPA does regulate lead salts, methylene chloride, and hexavalent chromium, which some manufacturers have disclosed as ingredients in tear gas.<sup>62</sup> Tear gas manufacturers do not disclose all ingredients, nor does the EPA require manufacturers to disclose their formula.<sup>63</sup>

#### A. Hexavalent Chromium

Of the extraneous ingredients in tear gas, hexavalent chromium is one of the most harmful to human health.<sup>64</sup> The EPA data sheet for hexavalent chromium states that it is “clearly established that inhaled chromium is a human carcinogen” and has classified it as a Group A carcinogen—the highest on the EPA’s hierarchy of harmful substances.<sup>65</sup> The major exposure route of humans to hexavalent chromium is through the inhalation of small particles.<sup>66</sup>

The harmful effect of hexavalent chromium on the human body is undeniable. Chromium toxicity targets the respiratory tract, causing shortness of breath, wheezing, coughing, and an increased risk of developing cancer.<sup>67</sup> Chronic exposure can cause damage to the septum,

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<sup>59</sup> *Safety Data Sheet: OC Stream*, AMTEC LESS-LETHAL SYSTEMS, <https://www.lesslethal.com/safety-data-sheets?task=document.viewdoc&id=160> [https://perma.cc/2LGB-CAD4] (last accessed Nov. 25, 2020).

<sup>60</sup> *Id.* See also Selsky, *supra* note 12.

<sup>61</sup> *How to Access the TSCA Inventory*, U.S. ENV’T. PROT. AGENCY <https://www.epa.gov/tscainventory/how-access-tscainventory#download> [https://perma.cc/583H-TXKN] (last accessed Dec. 3, 2021).

<sup>62</sup> *Initial List of Hazardous Air Pollutants with Modifications*, U.S. ENV’T. PROT. AGENCY <https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications> [https://perma.cc/G8XM-NTLV] (last accessed Nov. 25, 2020) (listing hazardous air pollutants, including chromium compounds and methylene chloride). See also *Lead (Pb) Air Pollution*, U.S. ENV’T. PROT. AGENCY <https://www.epa.gov/lead-air-pollution> [https://perma.cc/9MNZ-4NRJ] (last accessed Nov. 25, 2020) (providing information on the EPA’s regulation of airborne lead). Prop 65 Warning, *supra* note 42.

<sup>63</sup> Will Stone & Carrie Feibel, *From ‘Flash Bangs’ To ‘Rubber’ Bullets: The Very Real Risks of ‘Riot Control Agents’*, NPR (June 6, 2020), <https://www.npr.org/sections/health-shots/2020/06/06/871423767/from-flash-bangs-to-rubber-bullets-the-very-real-risks-of-riot-control-agents> [https://perma.cc/9PWG-XXX6].

<sup>64</sup> Johan Coetzee, Neetu Bansal, & Evans Chirwa, *Chromium in Environment, Its Toxic Effect from Chromite-Mining and Ferrochrome Industries, and Its Possible Bioremediation*, UNIV. OF PRETORIA DEPT. OF CHEM. ENG’G (June 30, 2020).

<sup>65</sup> *Chromium Compounds*, U.S. ENV’T. PROT. AGENCY <https://www.epa.gov/sites/production/files/2016-09/documents/chromium-compounds.pdf> [https://perma.cc/X53U-GR62] (last accessed April 14, 2021).

<sup>66</sup> Coetzee, *supra* note 64.

<sup>67</sup> *Chromium Compounds*, *supra* note 65.

bronchitis, decreased pulmonary function, and pneumonia, among other detrimental respiratory effects.<sup>68</sup>

The Occupational Safety and Health Administration (OSHA) has recognized the danger that industrial workers face when working with this dangerous chemical. To address these dangers, the OSHA has set forth requirements for workplaces that contain hexavalent chromium to limit employees' potential exposure.<sup>69</sup> The OSHA requires personal protective equipment, including eye and respiratory protection, when a hazard is likely present.<sup>70</sup> Additionally, employers must make medical examinations available within thirty days to exposed employees.<sup>71</sup> By including this chemical in tear gas, manufacturers are forcibly exposing civilians to severe health risks without their consent.

While hexavalent chromium toxicity has a devastating effect on human health, its impact on the environment is more insidious. Small amounts of hexavalent chromium occur naturally in the environment due to erosion of chromium deposits, but human industry can introduce larger amounts into the environment.<sup>72</sup> Hexavalent chromium, unlike other forms of chromium, is extremely water soluble and can affect the growth of plants when present in soil.<sup>73</sup> Chromium toxicity in plants results in diverse symptoms, including "decrease of seed germination, reduction of growth, decrease of yield, inhibition of enzymatic activities, impairment of photosynthesis, nutrient and oxidative imbalances, and mutagenesis."<sup>74</sup> Clearly, the release of hexavalent chromium into the soil has serious negative consequences for plant life.

The high solubility of hexavalent chromium also poses a threat to aquatic life. Chromium bioaccumulates in the gills, kidneys, and livers of marine life.<sup>75</sup> Exposure to hexavalent chromium in fish, even at lower levels, produces adverse effects on both fish biology (reduced function of gills and anemia) and behavior (uneven swimming and suspended eating).<sup>76</sup> Due to its devastating impact on both human health and plant and animal life, products containing hexavalent chromium should never be released into the environment without regulation.

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<sup>68</sup> *Id.*

<sup>69</sup> *OSHA Fact Sheet: Health Effects of Hexavalent Chromium*, U.S. DEPT. OF LAB. [https://www.osha.gov/OshDoc/data/General\\_Facts/hexavalent\\_chromium.pdf](https://www.osha.gov/OshDoc/data/General_Facts/hexavalent_chromium.pdf) [https://perma.cc/2N2X-LF87] (last accessed Nov. 25, 2020).

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Chromium in Drinking Water*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/sdwa/chromium-drinking-water#background> [https://perma.cc/5FXQ-3T4U].

<sup>73</sup> Coetzee, *supra* note 64. Arun Shanker, et al., *Chromium Toxicity in Plants*, ENV'T. INT'L. (July, 2005), <https://www.sciencedirect.com/science/article/pii/S0160412005000231> [https://perma.cc/CH2V-5HLP].

<sup>74</sup> Helena Oliveira, *Chromium as an Environmental Pollutant: Insights on Induced Plant Toxicity*, J. OF BOTANY (May 20, 2012) <https://www.hindawi.com/journals/jb/2012/375843/> [https://perma.cc/Z77Y-7QFN].

<sup>75</sup> Sonia Aslam & Ali Muhammad Yousafzai, *Chromium Toxicity in Fish: A Review Article*, J. OF ENTOMOLOGY AND ZOOLOGY STUD. (Apr. 23, 2017), <https://www.entomoljournal.com/archives/2017/vol5issue3/PartU/5-3-168-230.pdf> [https://perma.cc/EV3R-UGAK].

<sup>76</sup> *Id.*

### B. Lead Salts

Lead salts are another EPA-regulated ingredient that manufacturers utilize in tear gas canisters.<sup>77</sup> The term “lead salts” broadly refers to lead-based chemical compounds.<sup>78</sup> Chemical weapon manufacturers do not disclose the exact type or quantity of lead salts in their products. Accordingly, a great deal of uncertainty exists regarding the risks associated with human exposure to the lead salts that are present in chemical weapons.

The EPA regulates air, water, soil, and waste disposal for lead.<sup>79</sup> As with hexavalent chromium, OSHA has also put forth guidelines protecting workers from lead exposure.<sup>80</sup> The effects of lead on the human body are numerous. At low levels, lead toxicity can cause abdominal pain, fatigue, headache, loss of appetite and memory, and general malaise.<sup>81</sup> At higher levels, lead toxicity causes anemia, weakness, kidney and brain damage, and possibly death.<sup>82</sup> The CDC considers lead a likely human carcinogen.<sup>83</sup> While any exposure to lead may cause illness, the body absorbs higher levels of lead when inhaled.<sup>84</sup> Chemical weapons designed for use on humans work primarily through entry into the eyes, skin, and respiratory system; adding lead to these products could prove especially dangerous to human health.<sup>85</sup>

In addition to the devastating impacts on human health, lead persists in the environment through bioaccumulation.<sup>86</sup> Although low levels of naturally occurring lead in soil and water are not unusual, higher levels of lead in the environment are typically a byproduct caused by human industry and can cause significant harm.<sup>87</sup> Fish are highly susceptible to lead poisoning, particularly large fish at the top of the aquatic food chain.<sup>88</sup> The bioaccumulation of lead can result in liver and

<sup>77</sup> Prop 65 Warning, *supra* note 42.

<sup>78</sup> *Lead Salts*, ENCYCLOPEDIA BRITANNICA <https://www.britannica.com/science/lead-salt> [<https://perma.cc/389M-NZCL>].

<sup>79</sup> *Lead Laws and Regulations*, U.S. ENV'T. PROT. AGENCY <https://www.epa.gov/lead/lead-laws-and-regulations> [<https://perma.cc/W3G3-BLG2>] (last accessed Dec. 3, 2021).

<sup>80</sup> *Lead: Overview*, OCCUPATIONAL SAFETY AND HEALTH ADMIN. <https://www.osha.gov/lead> [<https://perma.cc/Z6LS-82NL>] (last accessed Dec. 3, 2021).

<sup>81</sup> *Lead: Health Problems Caused by Lead*, CTRS. FOR DISEASE CONTROL AND PREVENTION <https://www.cdc.gov/niosh/topics/lead/health.html> [<https://perma.cc/PVF3-BH5H>] (last accessed Nov. 11, 2021).

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> *Lead: Information for Workers*, CTRS. FOR DISEASE CONTROL AND PREVENTION, <https://www.cdc.gov/niosh/topics/lead/health.html> [<https://perma.cc/SV3M-P4YZ>] (last accessed Dec. 3, 2021).

<sup>85</sup> *Facts About Riot Control Agents Interim Document*, *supra* note 28.

<sup>86</sup> Ju-Wook Lee, et al., *Toxic Effects Of Lead Exposure On Bioaccumulation, Oxidative Stress, Neurotoxicity, And Immune Responses In Fish: A Review*, 68, ENV'T TOXICOLOGY AND PHARMACOLOGY, 101-108 (2019), [https://www.sciencedirect.com/science/article/pii/S1382668918304654#:~:text=Lead%20\(Pb\)%20is%20a%20highly,aquatic%20animals%2C%20especially%20in%20fish.&text=The%20Pb%20exposure%20induces%20a%20significant%20bioaccumulation%20in%20specific%20tissues%20in%20fish.h.&text=Oxidative%20stress%2C%20neurotoxicity%2C%20and%20immune%20alterations%20are,caused%20by%20the%20Pb%20exposure](https://www.sciencedirect.com/science/article/pii/S1382668918304654#:~:text=Lead%20(Pb)%20is%20a%20highly,aquatic%20animals%2C%20especially%20in%20fish.&text=The%20Pb%20exposure%20induces%20a%20significant%20bioaccumulation%20in%20specific%20tissues%20in%20fish.h.&text=Oxidative%20stress%2C%20neurotoxicity%2C%20and%20immune%20alterations%20are,caused%20by%20the%20Pb%20exposure) [<https://perma.cc/3XQU-9SLN>].

<sup>87</sup> *Lead Information Sheet*, N.C. DEP'T OF HEALTH & HUMAN SERVICES <https://epi.dph.ncdhhs.gov/oee/docs/LeadInfo.pdf> [<https://perma.cc/WR8B-Z9FC>].

<sup>88</sup> Ju-Wook Lee, *supra* note 86.

kidney damage and neurodegenerative disorders in fish.<sup>89</sup> Lead must be subject to strict regulation, as its solubility and tendency to bioaccumulate persists once introduced to the environment. Additionally, people who consume large quantities of lead-contaminated fish may be at risk for lead-related health complications.<sup>90</sup>

### C. Methylene Chloride

Some manufacturers have disclosed the use of methylene chloride in their chemical weapons.<sup>91</sup> Another substance regulated by OSHA and the EPA, methylene chloride, is typically used as a solvent and a propellant.<sup>92</sup> The EPA considers methylene chloride a probable human carcinogen.<sup>93</sup> Dozens of deaths have been associated with methylene chloride.<sup>94</sup> Exposure to methylene chloride can cause drowsiness, dizziness, numbness, nausea, loss of consciousness, and death.<sup>95</sup> While the release of methylene chloride into the environment does not have as severe an impact as hexavalent chromium and lead, the significant negative impact on the human body warrants regulation.<sup>96</sup>

Manufacturers know that the chemicals in their products are harmful. Although the safety sheets that some manufacturers publish state that the ingredients in their CS gas grenades are toxic to marine life, further details regarding the scope of danger to the environment are not provided.<sup>97</sup> In the safety sheets that describe the potential for bioaccumulation and the chemicals' mobility in soil, Less Lethal describes the effect of CS gas as "not available."<sup>98</sup> The most likely reason for Less Lethal to not provide the information is because of insufficient scientific evidence to support a clear conclusion. Other manufacturers provide even

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<sup>89</sup> *Id.*

<sup>90</sup> Abolfazl Askary Sary & Maryam Mohammadi, *Lead Bioaccumulation and Toxicity in Tissues of Economically Fish Species from River and Marine Water*, 89 BULLETIN OF ENV'T CONTAMINATION AND TOXICOLOGY 82, (2012).

[https://www.researchgate.net/publication/224835542\\_Lead\\_Bioaccumulation\\_and\\_Toxicity\\_in\\_Tissues\\_of\\_Economically\\_Fish\\_Species\\_from\\_River\\_and\\_Marine\\_Water](https://www.researchgate.net/publication/224835542_Lead_Bioaccumulation_and_Toxicity_in_Tissues_of_Economically_Fish_Species_from_River_and_Marine_Water) [<https://perma.cc/QY2C-56XR>].

<sup>91</sup> Prop 65 Warning, *supra* note 44.

<sup>92</sup> *Methylene Chloride (Dichloromethane) Info Sheet*, U.S. ENV'T. PROT. AGENCY, <https://www.epa.gov/sites/production/files/2016-09/documents/methylene-chloride.pdf> [<https://perma.cc/TB4B-WPY9>].

<sup>93</sup> *Id.*

<sup>94</sup> Eric Lipton, *The E.P.A.'s Top 10 Toxic Threats, and Industry's Pushback*, THE NEW YORK TIMES (Oct. 21, 2017), <https://www.nytimes.com/2017/10/21/us/epa-toxic-chemicals.html> [<https://perma.cc/U9MA-4CV3>].

<sup>95</sup> *Methylene Chloride*, CTRS. FOR DISEASE CONTROL AND PREVENTION, <https://www.cdc.gov/niosh/topics/methylenechloride/default.html> [last accessed Nov. 11, 2021]. [<https://perma.cc/8C92-NTT5>]

<sup>96</sup> See *Public Health Statement for Methylene Chloride*, AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, <https://www.cdc.gov/TSP/PHS/PHS.aspx?phsid=232&toxid=42> [<https://perma.cc/HY5N-KTXM>] (explaining that methylene chloride, once released into the environment, dissipates into the air and is broken down in the atmosphere to CO<sub>2</sub>).

<sup>97</sup> *Safety Data Sheet: Grenade, CS Smoke*, AMTEC LESS-LETHAL SYSTEMS, <https://www.lesslethal.com/safety-data-sheets?task=document.viewdoc&id=144> [<https://perma.cc/7WGX-Z5VZ>] (last accessed Nov. 25, 2020).

<sup>98</sup> *Id.*



less information, only disclosing enough to comply with California's Proposition 65 warning requirements.<sup>99</sup>

#### IV. MODERN STUDIES ON CHEMICAL WEAPONS

Very little modern research exists on the long- and short-term physical effects of exposure to the active ingredients in chemical weapons, particularly tear gas.<sup>100</sup> Recent studies, which rely heavily on military research upwards of fifty years old, focus only on the amount of tear gas not to be exceeded before resulting in irreversible damage or death.<sup>101</sup> In military studies, researchers found that “recruits who were exposed to tear gas during training exercises [had a] higher risk for contracting influenza, pneumonia, bronchitis, and other respiratory illnesses.”<sup>102</sup> This was not a slightly elevated risk—recruits were nearly 2.5 times more likely to develop respiratory complications after exposure to tear gas.<sup>103</sup> The Army responded by lowering the concentrations of tear gas used for training exercises and shortening the duration of exposure.<sup>104</sup>

Studying the effects of tear gas in the field has proven to be difficult. Weather and terrain provide barriers to accurate analysis; additionally, it is often not possible to determine the exact duration and concentration of an individual's exposure.<sup>105</sup> While some small-scale studies have been published in recent years, experts say that not enough research exists on the effects of tear gas on the broader population, particularly those with pre-existing health conditions like asthma.<sup>106</sup>

One missing element in the studies is the impact of chemical weapons on mental health. Most studies on chemical weapons focus on the physical repercussions of exposure to tear gas, and remarkably little information exists on the mental health consequences of exposure to chemical weapons. Exposure to tear gas can cause fear, anxiety, and panic—in some cases, people who have been tear-gassed or witnessed tear gassings can develop PTSD.<sup>107</sup>

Some new studies aim to gather more information about the effects of tear gas on reproductive organs, particularly the female reproductive system.<sup>108</sup> Medical professionals in Minnesota heard so many

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<sup>99</sup> Prop 65 Warning, *supra* note 42.

<sup>100</sup> Selsky, *supra* note 12.

<sup>101</sup> *Id.*

<sup>102</sup> Lisa Song, *Tear Gas Is Way More Dangerous Than Police Let On—Especially During the Coronavirus Pandemic*, PROPUBLICA (June 4, 2020), <https://www.propublica.org/article/tear-gas-is-way-more-dangerous-than-police-let-on-especially-during-the-coronavirus-pandemic> [<https://perma.cc/JBB8-4Y2K>].

<sup>103</sup> Selsky, *supra* note 12.

<sup>104</sup> *Id.*

<sup>105</sup> Rothenberg, *supra* note 33.

<sup>106</sup> Stone, *supra* note 63.

<sup>107</sup> *Study Highlights Lasting Effects of Tear Gas Use to Break Up Unruly Crowds*, FOX 12, [https://www.kptv.com/news/study-highlights-lasting-affects-of-tear-gas-use-to-break-up-unruly-crowds/article\\_9d9aaf92-b822-11ea-8482-6b7d4d4c42fb.html#:~:text=It%20also%20found%20being%20exposed,gassed%20can%20lead%20to%20PTSD](https://www.kptv.com/news/study-highlights-lasting-affects-of-tear-gas-use-to-break-up-unruly-crowds/article_9d9aaf92-b822-11ea-8482-6b7d4d4c42fb.html#:~:text=It%20also%20found%20being%20exposed,gassed%20can%20lead%20to%20PTSD) [<https://perma.cc/8RJ9-MA2D>].

<sup>108</sup> *Tear Gas and Reproductive Health Study*, PLANNED PARENTHOOD, <https://www.plannedparenthood.org/planned-parenthood-north-central-states/about-pnpcs/research/tear-gas-and-reproductive-health-study> [<https://perma.cc/U34T-R9RH>].



reports of protesters experiencing surprising changes to their menstruation cycles (for instance, missed or early periods) following large scale tear gassings that they commenced a study to learn more about the effects of tear gas on protestors with uteruses.<sup>109</sup>

While the currently available information on the effects of tear gas on the human body is limited, the information on the impact on the environment is even more sparse. In the absence of more complete data about the effects of residual CS on the environment, legislators in Oregon have requested for the EPA to investigate the effects of sustained tear gas use on humans, air, land, and water.<sup>110</sup> Portland's Bureau of Environmental Services found hexavalent chromium, cyanide, zinc, and barium in stormwater catch basins near the protest sites; it found these chemicals present in higher amounts than in other parts of the city.<sup>111</sup> Legislators sent the letter to the EPA on August 13, 2020, and requested a response by August 31, 2020.<sup>112</sup> As of October 3, 2021, EPA has not yet published a response.

Despite the lack of information available on CS compounds, abundant research shows other elements added to tear gas, such as hexavalent chromium, lead salts, and methylene chloride, are harmful not only to the human body but also the environment. The potential for bioaccumulation alone makes the regulation of chemical weapons a necessity. It does not matter how infrequently the police unleash tear gas so long as the chemicals accumulate in the water, soil, and animal life over time. The chemical weapons manufacturing industry suffers from a lack of regulation impacting both the health of U.S. residents and the health of the environment.

## V. LEGAL STATUS

Commentators raise the issue of how the use of tear gas and other chemical weapons as a crowd control agent—particularly at peaceful protests—serves as repression of protected free speech.<sup>113</sup> Indeed, a long history of litigation surrounds the constitutionality of chemical weapons

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<sup>109</sup> *Id.*

<sup>110</sup> Monica Samayoa, *Portland Vacuums Tear Gas Residue From Storm Drains Downtown*, OBP (Aug. 6, 2020), <https://www.opb.org/article/2020/08/06/portland-oregon-tear-gas-storm-drains-sewer-cleaning-protests/> [https://perma.cc/94Y4-MJKK].

<sup>111</sup> Selsky, *Environmental Groups Sue Over Portland Tear Gas Use*, THE ASSOCIATED PRESS (Oct. 20, 2020), <https://apnews.com/article/lawsuits-oregon-environment-environmental-policy-portland-bf9025735e2687b0f5fa71d8587a45bc> [https://perma.cc/3L4Q-43XF].

<sup>112</sup> KATU Staff, *Oregon leaders ask EPA to investigate impacts of tear gas on the environment*, KATU 2 (Aug. 14, 2020), <https://katu.com/news/local/oregon-leaders-ask-epa-to-investigate-impacts-of-tear-gas-on-the-environment> [https://perma.cc/6MAL-P6JM].

<sup>113</sup> Abdullah Hasan, *The Law Enforcement Violence Trump Won't Talk About*, ACLU (Sep. 1, 2020), <https://www.aclu.org/news/criminal-law-reform/the-law-enforcement-violence-trump-wont-talk-about/> [https://perma.cc/V3QR-7H8J] (providing a list of incidents where police brutality, often involving tear gas or pepper spray, was affected against protesters exercising their First Amendment rights in Portland). See also *Black Lives Matter Sues Trump and Barr Over Use of Force in a D.C. Protest*, FIRST AMENDMENT WATCH (June 5, 2020), <https://firstamendmentwatch.org/black-lives-matter-sues-trump-and-barr-over-use-of-force-in-a-d-c-protest/> [https://perma.cc/RH5S-7YQR] (highlighting a civil rights lawsuit revolving around the use of chemical weapons on peaceful protesters in Washington, D.C.).

use against peaceful protesters.<sup>114</sup> For this paper, an in-depth examination of the environmental and health consequences of chemical weapons will replace a full constitutional analysis. However, when considering the legal background of the use of chemical weapons, it is worth keeping in mind that a host of other issues surround their use outside the scope of this paper.

The Geneva Protocol of 1925 prohibits the use of “asphyxiating, poisonous or other gases, and of all analogous liquids, materials, or devices.”<sup>115</sup> These protections were strengthened by the 1993 Chemical Weapons Convention, which prohibits the development, production, stockpiling, and use of chemical weapons.<sup>116</sup> Despite the bans on chemical weapons in international warfare, an exception in the Chemical Weapons Convention allows domestic law enforcement agencies of the signing countries to use chemical weapons on their citizens.<sup>117</sup> The U.S. is not alone in using tear gas and other chemicals on its population; in recent years, protesters in Hong Kong, France, the Middle East, and many other regions experiencing domestic upheaval have been subjected to chemical weapons as a form of crowd control by their governments, although the exact amount of tear gas is often difficult to ascertain as governments do not track its use.<sup>118</sup>

In addition to not tracking the amount or types of chemicals used, no federal guidelines prescribe the deployment of chemical weapons. Regulation is left to local governments who routinely leave them vague. For example, the Seattle Police Department (SPD) instructs its officers to use OC spray when “objectively reasonable, necessary, and proportional.”<sup>119</sup> These standards are challenging to define in practice, as what is objectively reasonable to one officer in a certain situation may not

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<sup>114</sup> Heidi Boghosian, *The Assault on Free Speech, Public Assembly, and Dissent*, NATIONAL LAWYERS GUILD, 67-69 (2004), <https://www.nlg.org/wp-content/uploads/2020/03/assault-on-free-speech-public-assembly-and-dissent.pdf>.

[<https://perma.cc/TG2Q-SH3Z>]. See also Karen Aichinger, *Cox v. Louisiana* (1965), THE FIRST AMEND. ENCYCLOPEDIA (2009), <https://www.mtsu.edu/first-amendment/article/183/cox-v-louisiana> [<https://perma.cc/AB6S-NNCF>] (detailing a Civil Rights era case where a protest was approved by the police but was then broken up with tear gas and its organizer arrested for “disturbing the peace,” among other charges).

<sup>115</sup> Geneva Protocol, *supra* note 9.

<sup>116</sup> Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Apr. 29, 1997, 2056 U.N.T.S. 45, 36 I.L.M. 800 (hereinafter Chemical Weapons Convention), <https://www.opcw.org/chemical-weapons-convention> [<https://perma.cc/QN3T-AXG2>].

<sup>117</sup> *Id.* at art. II.

<sup>118</sup> Hillary Leung, *Tear Gas Is Now a Fact of Life in Hong Kong. Residents Are Wondering What It's Doing to Their Health*, TIME MAGAZINE (Dec. 4, 2019), <https://time.com/5743663/tear-gas-hong-kong/> [<https://perma.cc/UR35-RTBD>] (reporting that around 10,000 rounds of tear gas have been fired on Hong Kong protesters during a six month period). Dominique Vidalon, *Paris Police Use Tear Gas, Water Cannon On 'Yellow Vest' Protests Anniversary*, REUTERS (Nov. 16, 2019), <https://www.reuters.com/article/us-france-protests-anniversary/paris-police-use-tear-gas-water-cannon-on-yellow-vest-protests-anniversary-idUSKBN1XQ0BN> [<https://perma.cc/ZA3T-CE5J>]. Jason Slotkin, *Police Fire Tear Gas As Thousands Express Outrage Over Beirut Explosion*, NPR (Aug. 8, 2020), <https://www.npr.org/2020/08/08/900500373/police-fire-tear-gas-as-thousands-express-outrage-over-beirut-explosion> [<https://perma.cc/F2UZ-LRZ2>]. Jen Kinney, *The Global Tear Gas Business Is Booming. It's Complicated*, THE WORLD (Nov. 29, 2018), <https://www.pri.org/stories/2018-11-29/global-tear-gas-business-booming-its-complicated> [<https://perma.cc/4KE6-Z8FK>].

<sup>119</sup> SPD manual 8.300 (Aug. 1, 2021), <https://www.seattle.gov/police-manual/title-8---use-of-force/8300---use-of-force-weapons-and-tools> [<https://perma.cc/3739-ZG9H>].

be reasonable to another officer in the same situation. No universal set of guidelines governs the appropriate level of force (including the use of less-lethal chemical weapons) by law enforcement.<sup>120</sup> Lack of federal regulation leads to open ended local regulations that allow local police departments to choose the standards they will adhere to when utilizing chemical weapons against the public.

### A. Case Law

U.S. courts have occasionally heard cases relating to police use of tear gas, although they rarely, if ever, succeed. Some of these cases arise from products liability claims, such as the 1986 Illinois case *Frazier v. Smith & Wesson*. Here, the police launched three Smith & Wesson-manufactured tear gas canisters into Mr. Frazier's home after he locked himself in the basement, two of which police later recovered from the basement.<sup>121</sup> Police found Mr. Frazier beneath a smoldering mattress with which he tried to smother a tear gas canister.<sup>122</sup> He died six days later.<sup>123</sup> His widow sued Smith & Wesson on theories of strict liability in tort and negligence, first claiming that Mr. Frazier died as a result of a fire caused by the gas canisters.<sup>124</sup> She later amended her complaint to state that Mr. Frazier died as result of inhaling large quantities of gas.<sup>125</sup> Smith & Wesson filed a motion for summary judgement in an attempt to get the case dismissed, claiming that the statute of repose had expired and that in any case, the canisters could not have caused fire damage.<sup>126</sup> However, the court concluded that because Smith & Wesson did not address her claim that the gas was a cause of Mr. Frazier's death, a genuine issue of material fact existed regarding whether Mr. Frazier could have died from exposure to the gas.<sup>127</sup> In the end, Mr. Frazier's widow lost the case.<sup>128</sup>

Other legal cases argue the manufacturer's failure to warn as a theory of recovery. In *Hernandez v. City of Beaumont*, police permanently blinded Ms. Monique Hernandez by shooting her point-blank in the face using a high-tech OC spray.<sup>129</sup> Ms. Hernandez brought suit against the City of Beaumont and settled her claim for \$18.5 million.<sup>130</sup> The City of Beaumont then sought to recover from the designer and manufacturer (Piexon), the distributor (IBS Sigma, Inc.), and the sales manager (Bart Bacolini) of the OC spray.<sup>131</sup> The City's claim failed, and the court issued

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<sup>120</sup> *Overview of Police Use of Force*, NATIONAL INSTITUTE OF JUSTICE (Mar. 5, 2020), <https://nij.ojp.gov/topics/articles/overview-police-use-force> [https://perma.cc/5AAS-4BY9].

<sup>121</sup> *Frazier v. Smith & Wesson*, 140 Ill. App. 3d 963, 965, 489 N.E.2d 495 (1986).

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

<sup>125</sup> *Id.* at 965.

<sup>126</sup> *Id.* at 967.

<sup>127</sup> *Id.* at 967-68.

<sup>128</sup> *Id.* at 968.

<sup>129</sup> *Hernandez by & through Hernandez v. City of Beaumont*, No. EDCV 13-00967 DDP (DTBX), 1, 2016 WL 8732460 (C.D. Cal. Sept. 30, 2016) (aff'd sub nom. *Hernandez v. City of Beaumont*, 742 F. App'x 257 (9th Cir. 2018)).

<sup>130</sup> *Id.*

<sup>131</sup> *Id.*

summary judgment in favor of Peixon.<sup>132</sup> Peixon escaped liability, and although Bacolini was determined to be an agent of IBS, there is no further mention of either IBS or Bacolini in the court record.<sup>133</sup> No further records are available, but it is possible that the parties settled.

### B. Attempts at Regulation

Despite various lawsuits over the years concerning the use of chemical weapons, the United States does not have any federal laws regulating the manufacture of tear gas or its use by police.<sup>134</sup> Following the widespread and publicized use of chemical weapons during the racial justice protests of 2020, Congress introduced two bills to rein in law enforcement's use of chemical weapons.<sup>135</sup> Unfortunately, both of the bills died in Congress.<sup>136</sup> Even so, examining the failed legislation helps in understanding how federal legislation can drastically affect how federal and local law enforcement are allowed to react to civil unrest.

The No Tear Gas or Projectiles Act (NTGPA), introduced by Senator Edward Markey (D-MA) on June 30, 2020, would have "[prohibited] federal law enforcement officers from using [chemical and kinetic crowd control weapons] for any purpose while on duty."<sup>137</sup> Additionally, a state or local government must have [had] in effect a similar prohibition and civil penalties to be eligible for funds under the Edward Byrne Memorial Justice Assistance Grant [JAG] program and the Community Oriented Policing Services [COPS] program.<sup>138</sup> The JAG program has granted a total amount of \$72,243,297 in over 906 awards.<sup>139</sup> Since 1994, COPS granted over \$14 billion to local law enforcement agencies nationwide to fund anti-drug task forces, community policing development, and school violence prevention programs.<sup>140</sup>

The NTGPA does not leave loopholes for federal law enforcement officers, assuring greater compliance with the law. There can be no confusion about when chemical weapons are allowed because the NTGPA does not allow for their use.<sup>141</sup> The success of proposed laws, like the NTGPA, is closely tied to how dependent a state is on federal capital to

<sup>132</sup> *Id.* at 10.

<sup>133</sup> *Id.* at 1.

<sup>134</sup> Selsky, *supra* note 12.

<sup>135</sup> No Tear Gas or Projectiles Act of 2020, S.4114, 116th Cong. (2020), <https://www.congress.gov/bill/116th-congress/senate-bill/4114/text?r=3&s=1> [https://perma.cc/PZ7N-JY2S]. See also Prohibiting Law Enforcement Use of Chemical Weapons Act of 2020, H.R.7221, 116th Cong. (2020), <https://www.congress.gov/bill/116th-congress/house-bill/7221?s=1&r=11> [https://perma.cc/X32M-PC5G].

<sup>136</sup> S. 4114 (116th): No Tear Gas or Projectiles Act, GOVTRACK, <https://www.govtrack.us/congress/bills/116/s4114> (last visited Nov. 10, 2021) [https://perma.cc/H2JJ-GKT3]. See also H.R. 7221 (116th): Prohibiting Law Enforcement Use of Chemical Weapons Act, GOVTRACK, <https://www.govtrack.us/congress/bills/116/hr7221> [https://perma.cc/LLE3-W8N4] (last visited Nov. 10, 2021).

<sup>137</sup> No Tear Gas or Projectiles Act of 2020, *supra* note 136.

<sup>138</sup> *Id.*

<sup>139</sup> FY 2020 Edward Byrne Memorial Justice Assistance Grant (JAG) Program Local Formula Solicitation, BUREAU OF JUSTICE ASSISTANCE (July 9, 2020), <https://bja.ojp.gov/funding/opportunities/bja-2020-17276> [https://perma.cc/XZG6-VLRN].

<sup>140</sup> Grants, COMMUNITY ORIENTED POLICING SERVICES, <https://cops.usdoj.gov/grants> [https://perma.cc/D6LA-D4UV] (last accessed Nov. 24, 2020).

<sup>141</sup> No Tear Gas or Projectiles Act of 2020, *supra* note 136.

fund its law enforcement agencies. Although the precise percentage varies from city to city, the federal government—primarily by way of programs like COPS and JAG—pays for about 20% of police spending.<sup>142</sup> This degree of budget loss would devastate city police, particularly for police budgets in several major cities that have already taken a hit as a result of the “Defund the Police” movement and coronavirus-related cuts.<sup>143</sup> Considering the sheer amount of police funding these federal programs disburse, the loss of even a fraction of that funding would incentivize states to comply with laws like the NTGPA.

Individual states may be reluctant to accept such a law. Heavily Republican states, already disinclined to limit local law enforcement’s power and use of chemical weapons, might refuse to comply with the NTGPA in favor of taking a fiscal penalty.<sup>144</sup> This possibility risks producing a checkerboard application of the law. Since the NTGPA only mandates the loss of chemical weapons for federal officers, local law enforcement may still be able to use chemical weapons if their state is willing to forego federal funding.

Fifteen days prior to Congress introducing the NTGPA, House Representative Alexandria Ocasio-Cortez (D-NY) introduced the Prohibiting Law Enforcement Use of Chemical Weapons Act (PLEUCWA).<sup>145</sup> The PLEUCWA was far more expansive than the NTGPA and would have “[prohibited] federal, state, and local law enforcement officers from using chemical weapons in the course of policing activities.”<sup>146</sup> It also require[d] law enforcement agencies to dispose of chemical weapons that were acquired for such use.”<sup>147</sup> The PLEUCWA had the advantage of applying the same law to all states, regardless of any attempts by local governments to evade the law. Consistent application of the law would create a uniform regulation of chemical weapons across the nation and avoid the inconsistency issues that might have arisen with the NTGPA.

The PLEUCWA explicitly included limits not just for federal authorities, but for state and local authorities as well. While this would be a big step towards a uniform national solution, it comes with significant challenges. One major hurdle is the anti-commandeering doctrine established in *New York v. U.S.*, where the U.S. Supreme Court held that

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<sup>142</sup> Nathaniel Lee, *Here’s How Two Federal Programs Helped Expand Police Funding By Over 200% Since 1980*, CNBC (June 25, 2020, 11:16 AM), <https://www.cnbc.com/2020/06/25/two-federal-programs-helped-expand-police-funding-by-over-200percent.html> [<https://perma.cc/FF4A-VWYA>].

<sup>143</sup> Carl Sullivan & Carla Baranauckas, *Here’s How Much Money Goes To Police Departments In Largest Cities Across The U.S.*, USA TODAY (June 26, 2020, 7:00 AM), <https://www.usatoday.com/story/money/2020/06/26/how-much-money-goes-to-police-departments-in-americas-largest-cities/112004904/> [<https://perma.cc/WW6L-RKMW>]. See also Jemima McEvoy, *At Least 13 Cities Are Defunding Their Police Departments*, FORBES (Aug. 12, 2020, 10:24 AM), <https://www.forbes.com/sites/jemimamcevoy/2020/08/13/at-least-13-cities-are-defunding-their-police-departments/?sh=14011f3429e3> [<https://perma.cc/P2VG-BXE3>].

<sup>144</sup> Cf. Manu Raju, *Top Republican Senators Defend Trump’s Church Photo-Op After Peaceful Protesters Cleared out*, CNN (June 2, 2020, 6:09 PM), <https://www.cnn.com/2020/06/02/politics/congress-republican-reaction-trump-church/index.html> [<https://perma.cc/F295-EWKJ>].

<sup>145</sup> Prohibiting Law Enforcement Use of Chemical Weapons Act of 2020, H.R.7221, 116th Cong. (2020).

<sup>146</sup> *Id.*

<sup>147</sup> *Id.*

“Congress may not commandeer the States’ legislative processes by directly compelling them to enact and enforce a federal regulatory program.”<sup>148</sup> The Court held that the federal government can urge a state to comply with its interests by leveraging its powers under the Spending Clause (such as it did to enact the minimum drinking age), or by directly regulating private activity under the Commerce Clause.<sup>149</sup> The PLEUCWA, in attempting to regulate state law enforcement agencies, would likely run afoul of the anti-commandeering doctrine.

A highly partisan Congress is unlikely to pass a law regulating the manufacture and use of chemical weapons by law enforcement. Currently, political divisions starkly divide the political parties who have vastly different views of policing. About three quarters of Republicans believe that law enforcement does a good job of treating different ethnic groups equally and using an appropriate amount of force; only about a quarter of Democrats agree.<sup>150</sup> Similarly, political groups have differing opinions on how law enforcement agencies should use chemical weapons. For example, a Texas survey found that 22% of surveyed Republicans strongly supported the use of tear gas against peaceful protesters, compared to 6% of surveyed Democrats and 5% of Independents.<sup>151</sup> The same study found that only 17% of surveyed Republicans strongly opposed the use of chemical weapons on peaceful protesters compared to 46% of surveyed Independents and 54% of surveyed Democrats, who had the highest rate of strong opposition in the survey.<sup>152</sup> This ideological gap will likely prove a significant hurdle in future efforts to regulate the manufacture and use of chemical weapons.

Proposed legislation at the state level to restrict the use of chemical weapons has been more successful than federal attempts at regulation, but it has still been met with a significant amount of resistance.<sup>153</sup> For example, a Massachusetts bill attempted to ban tear gas but the effort failed to garner enough votes.<sup>154</sup> Democratic legislators in Michigan and California have introduced bills to curb the use of chemical weapons on protesters, but the unlikelihood of a bipartisan agreement, particularly considering opposition from Republicans and local police associations, seems to have blocked the future of those bills.<sup>155</sup>

Some successful bills are not restrictive enough to completely halt the harmful use of tear gas. For example, Oregon’s recently passed

<sup>148</sup> *New York v. United States*, 505 U.S. 144, 145, 112 S. Ct. 2408, 120 L. Ed. 2d 120 (1992)

<sup>149</sup> *Id.* at 173.

<sup>150</sup> Anna Brown, *Republicans More Likely Than Democrats To Have Confidence In Police*, PEW RESEARCH CENTER (Jan. 13, 2017), <https://www.pewresearch.org/fact-tank/2017/01/13/republicans-more-likely-than-democrats-to-have-confidence-in-police/> [<https://perma.cc/DL5H-6FVR>].

<sup>151</sup> Todd J. Gillman, *Rubber Bullets? Tear Gas? In Texas, Most Republicans OK Putting Down Protests By Force; Most Dems Don’t Support The Tactics*, THE DALLAS MORNING NEWS (Sept. 7, 2020, 5:00 AM), <https://www.dallasnews.com/news/politics/2020/09/07/rubber-bullets-tear-gas-in-texas-most-republicans-ok-putting-down-protests-by-force-most-dems-dont/> [<https://perma.cc/EUU9-JYRJ>].

<sup>152</sup> *Id.*

<sup>153</sup> Lindsey Van Ness, *Tear Gas Bans: A Policing Change Not Gaining Traction*, THE PEW CHARITABLE TRUSTS (Aug. 4, 2020), <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2020/08/04/tear-gas-bans-a-policing-change-not-gaining-traction> [<https://perma.cc/F47Z-5BMG>].

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*



legislation banning tear gas provides an exception for police when declaring a riot and after giving orders to disperse.<sup>156</sup> Seattle's proposed chemical weapons ban would prohibit almost all use of chemical weapons, but would allow officers to use them under certain circumstances such as where the use is "reasonably necessary to prevent threat of imminent loss of life or serious bodily injury, and the risk of serious bodily injury from violent actions outweighs the risk of harm to bystanders."<sup>157</sup>

In contrast, the Philadelphia City Council passed a bill that bans the use of tear gas, rubber bullets, and pepper spray by police during all First Amendment-protected activities.<sup>158</sup> When the Mayor signed the bill into law, it became the first legislation in the U.S. to provide a sweeping ban on chemical weapons.<sup>159</sup> In the absence of a federal restriction, this type of local ordinance protects both peaceful protesters and the environment from chemical weapons.

### C. Washington State's Chemical Weapons Ban

In Washington State, the courts and the legislature have engaged in complex maneuvering regarding a potential chemical weapons ban. During the racial justice protests of 2020, Seattle was a high-profile backdrop for dramatic clashes between law enforcement officers and protesters. Powerful visuals emerged from the city, such as massive clouds of tear gas rolling down residential streets and children being sprayed with OC spray by police officers.<sup>160</sup> On June 9, 2020, Black Lives Matter of Seattle-King County and several protesters filed a lawsuit against the City of Seattle seeking a temporary restraining order (TRO) to prohibit the Seattle Police Department (SPD) from using chemical weapons indiscriminately on a crowd of protesters.<sup>161</sup> On June 12, 2020, U.S. District Judge Richard Jones granted the motion for a TRO.<sup>162</sup>

A few days later, on June 15, the Seattle City Council voted unanimously to prohibit the SPD from utilizing tear gas.<sup>163</sup> The ban would

<sup>156</sup> *Id.*

<sup>157</sup> *Council Passes New Version of Less Lethal Weapons Ban*, COUNCIL CONNECTION, <https://council.seattle.gov/2021/08/16/council-passes-new-version-of-less-lethal-weapons-ban/> [https://perma.cc/MCK4-JWJS] (last visited Nov. 10, 2021).

<sup>158</sup> Darryl Murphy, *Philly City Council Passes Ban On Use Of Tear Gas, Rubber Bullets On Protesters*, WHYY PBS (Oct. 29, 2020), <https://whyy.org/articles/philly-city-council-passes-ban-on-use-of-tear-gas-rubber-bullets-at-protests/> [https://perma.cc/XR7K-CH8K].

<sup>159</sup> The Philadelphia Code Chapter 10-2500 (2020), [https://codelibrary.amlegal.com/codes/philadelphia/latest/philadelphia\\_pa/0-0-0-219464](https://codelibrary.amlegal.com/codes/philadelphia/latest/philadelphia_pa/0-0-0-219464) [https://perma.cc/63BJ-3YBZ].

<sup>160</sup> See Stefan Milne, *Seattle's Summer of Protest for Black Lives: A Timeline*, SEATTLE MET (Sept. 4, 2020, 8:00 AM), <https://www.seattlemet.com/news-and-city-life/2020/09/seattle-summer-of-protest-for-black-lives-a-timeline> [https://perma.cc/6UCO-UTL3].

<sup>161</sup> Motion for Temporary Restraining Order, *Black Lives Matter Seattle-King County v City of Seattle* (June 9, 2020), <https://www.aclu-wa.org/docs/motion-temporary-restraining-order-1> [https://perma.cc/9ZU3-4E9Z].

<sup>162</sup> Order Granting Temporary Restraining Order, *Black Lives Matter Seattle-King County v City of Seattle* (June 12, 2020), <https://www.aclu-wa.org/docs/order-granting-temporary-restraining-order> [https://perma.cc/AQ7H-ABJL].

<sup>163</sup> Graham Johnson, *Seattle City Council Passes Police Tear Gas Ban*, KIRO 7 NEWS (June 15, 2020), <https://www.kiro7.com/news/local/seattle-city-council-considering-permanent-ban-crowd-control-weapons/HD6LHD54NBDBNKTSFAAY7EY5FU/> [https://perma.cc/M8JW-XZY8].



permit the use of pepper spray—although not for use at protests.<sup>164</sup> However, at the time of the vote, Seattle was under a federal consent decree overseen by the Department of Justice (DOJ).<sup>165</sup> The federal consent decree required the SPD to address issues of alleged departmental and personnel racism and abuse of force under the DOJ's supervision.<sup>166</sup> This also meant that any changes in the SPD's operating policy, including departmental rules on use of chemical weapons, required review and approval by the DOJ.<sup>167</sup> With this in mind, U.S. District Judge James Robart placed the City Council's chemical weapons ban on hold until the DOJ could review the matter.<sup>168</sup> The TRO granted on June 12th remains in effect, although it falls short of a complete ban.<sup>169</sup> The case that originated the TRO is stayed until the federal court issues an order.<sup>170</sup>

The future of Seattle's long-term ban on less-lethal chemical weapons is uncertain. Most recently, Judge Robart issued a TRO to halt the proposed ban and scolded Seattle City Council members for attempting to "contravene" the consent decree.<sup>171</sup> The City Council responded by sending Judge Robart a draft of a proposed law that would allow some use of chemical weapons—rather than a complete ban—as a compromise.<sup>172</sup>

As of October 3, 2021, the TRO issued in the *Black Lives Matter v. City of Seattle* case prevents the SPD from using chemical weapons unless they can show that the deployment was "necessary, reasonable, proportional, and targeted," and made in response to specific acts of violence or destruction.<sup>173</sup> In addition, chemical weapons may not be "deployed indiscriminately into a crowd," be used to re-route a protest, or be used without warning against journalists, legal observers, or medics.<sup>174</sup>

## VI. COUNTER ARGUMENTS

Despite the presence of undeniably toxic substances in chemical weapons, their proponents argue that the use of tear gas and pepper spray

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<sup>164</sup> *Id.*

<sup>165</sup> *DOJ Settlement Agreement*, SEATTLE POLICE DEP'T, <https://www.seattle.gov/police/about-us/professional-standards-bureau/settlement-agreement-history> [https://perma.cc/44JM-WADT] (last accessed Nov. 24, 2020).

<sup>166</sup> *Id.*

<sup>167</sup> Mike Carter, *Durkan, Best Say Seattle City Council's Ban On Police 'Crowd-Control Weapons' Conflicts With Consent Decree*, THE SEATTLE TIMES (July 18, 2020), <https://www.seattletimes.com/durkan-chief-says-city-councils-ban-on-police-crowd-control-weapons-conflicts-with-consent-decree/> [https://perma.cc/ZOS3-JB99]. See also Tony Black, *What The Federal Consent Decree Means For Seattle Police Department*, KING 5 NEWS (June 4, 2020, 9:29 PM), <https://www.king5.com/article/news/what-the-federal-consent-decree-means-for-seattle-police-department/281-1c410cb9-206c-4ff3-b6b9-e085ffb88648> [https://perma.cc/88NP-C8BW].

<sup>168</sup> David Kroman, *Judge Blocks Seattle's Ban On Tear Gas, Other Crowd Control Weapons*, CROSSCUT (July 24, 2020), <https://crosscut.com/2020/07/judge-blocks-seattles-ban-tear-gas-other-crowd-control-weapons> [https://perma.cc/23UF-4DUX].

<sup>169</sup> *Id.*

<sup>170</sup> Order Clarifying Preliminary Injunction, *Black Lives Matter Seattle-King County v City of Seattle* (Aug. 10, 2020), <https://www.aclu-wa.org/docs/order-clarifying-preliminary-injunction> [https://perma.cc/R7HA-C74Y].

<sup>171</sup> Matt Markovich, *Seattle City Council Asks For Judicial Review Before Approving Crowd Control Rules*, KOMO NEWS (Feb. 9, 2021), <https://komonews.com/news/local/seattle-city-council-asks-for-judicial-review-before-approving-use-of-force-rule> [https://perma.cc/UY54-AAUH].

<sup>172</sup> *Id.*

<sup>173</sup> *Id.*

<sup>174</sup> *Id.*

is justified due to the purported enhanced safety of both officers and civilians. Supporters of chemical weapons, the most vocal of whom are law enforcement officers, claim that chemical weapons allow them to subdue people before resorting to batons or other means of force, thereby avoiding permanent injury.<sup>175</sup>

Another argument in favor of chemical weapons usage by law enforcement officers suggests that no feasible alternatives exist in times of unrest. Police have touted chemical weapons as a “last resort” before using physical or lethal weapons.<sup>176</sup> Jeff Estes, Deputy Police Chief of the Charlotte-Mecklenburg Police Department, said to the Associated Press: “I know the effects [of tear gas]. I would rather have that than what we’ve seen in other places where people who are violently assaulting other people have to get hit with sticks and shields.”<sup>177</sup> These kinds of comments by law enforcement officers suggest that they regard tear gassings as a preferable alternative to assault.

Claims by law enforcement that chemical weapons are necessary are based largely on the notion that the police are responding to crowds of violent protesters. However, recent data shows that over 93% of summer 2020 demonstrations nationwide were peaceful, while over 100 cities were tear gassed by their police forces.<sup>178</sup> Studies show that the police response to peaceful protests against police brutality were particularly excessive—law enforcement used force “more often than not,” and the police used disproportionate force against protesters when compared to protests not focused on police brutality.<sup>179</sup> A striking example of this dichotomy was the underwhelming police reaction to the violent armed assault on the U.S. Capitol on January 6, 2021. There, in startling contrast to police tactics mere months earlier that saw rubber bullets and clouds of tear gas unleashed on largely peaceful crowds, the police “acted helpless” and watched the invasion of the seat of American democracy, with one officer taking a selfie with members of the mob.<sup>180</sup> The crowd, once inside the Capitol building, occupied the premises for several hours.<sup>181</sup> Many commenters and politicians, including President Joe Biden, have stated that police would have treated the violent protesters storming the Capitol with much more force had they been Black.<sup>182</sup> Law enforcement’s targeted use of tear gas in only certain types of protests suggests that human bias likely contributes to the decision to use chemical weapons. One solution

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<sup>175</sup> Van Ness, *supra* note 153.

<sup>176</sup> Selsky, *supra* note 12.

<sup>177</sup> *Id.*

<sup>178</sup> Sanya Mansoor, *93% of Black Lives Matter Protests Have Been Peaceful, New Report Finds*, TIME MAGAZINE (Sept. 5, 2020),

<https://time.com/5886348/report-peaceful-protests/> [https://perma.cc/96D2-BMUS]. K.K. Rebecca Lai, Bill Marsh, & Anjali Singhvi, *Here Are the 100 US Cities Where Protesters Were Tear-Gassed*, NY TIMES (June 18, 2020), <https://www.nytimes.com/interactive/2020/06/16/us/george-floyd-protests-police-tear-gas.html> [https://perma.cc/BY9M-ADC4].

<sup>179</sup> *Id.*

<sup>180</sup> Aaron Morrison, *Race Double Standard Clear In Rioters’ Capitol Insurrection*, THE ASSOCIATED PRESS (Jan. 7, 2021),

<https://apnews.com/article/congress-storming-black-lives-matter-22983dc91d16bf949efbb60cdda4495d> [https://perma.cc/M4YH-B8M6].

<sup>181</sup> *Id.*

<sup>182</sup> *Id.*

to minimize or control this bias, in addition to other measures such as increased training, education, and the levying of penalties, is to federally regulate chemical weapons use by police departments.

Not all protesters are violent and law enforcement should not have full discretion to utilize chemical weapons. A cloud of tear gas will affect everything in its path, both protesters and passersby alike. Unfortunately, law enforcement has preemptively used chemical weapons against protestors.<sup>183</sup> Using gas on a peaceful crowd or spraying pepper spray into an angry crowd only “creates violence where none exists.”<sup>184</sup>

## VII. RECOMMENDATIONS FOR REFORM

Restricting law enforcement’s use of chemical weapons will not be easy. Even if governments put into place legislation that removes chemical weapons from the hands of law enforcement agencies, true reform will require both a rethinking of how policing works in the U.S. as well as new innovations in technology and development.

From a technological perspective, recent technologies exist which can improve the police-protester dynamic, such as non-chemical alternatives to current crowd control methods. Some military inventions such as the Active Denial System (ADS) and Long-Range Acoustic Device (LRAD), while more environmentally friendly than tear gas, are still fairly indiscriminate and not developed with the protection of civil rights in mind.<sup>185</sup> Therefore, they are not a good fit for law enforcement.

Options for non-lethal crowd control exist that do not have a lasting impact on the environment. One such device is still in development—a targeted non-chemical ranged crowd control weapon called the Small Arms Pulsed Electronic Tetanization at Extended Range (SPECTER), which is essentially a taser dart.<sup>186</sup> While police may find this useful for targeting a single person in a relatively controlled environment, this type of weapon has potential for extreme mismanagement in a shifting crowd. Successful use of a SPECTER device could partner the recent technology with advanced officer training.

Companies are actively developing purely physical types of restraining weapons for law enforcement use. One such weapon, developed by Wrap Technologies, is called the BolaWrap, a thin Kevlar

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<sup>183</sup> Van Ness, *supra* note 153.

<sup>184</sup> *Id.*

<sup>185</sup> The Active Denial System (ADS) uses electromagnetic energy in a focused beam that can be turned on a crowd. Exposure to that beam causes targets to feel unbearably hot and can cause blisters. See Active Denial System FAQs, <https://jnlwp.defense.gov/About/Frequently-Asked-Questions/Active-Denial-System-FAQs/> [<https://perma.cc/D5EO-U9KR>]. The Long-Range Acoustic Device (LRAD) is a speaker system that directionally focuses sound at extreme volumes. Exposure causes sound injury including tinnitus, loss of hearing, headaches, and vertigo. See Daphne Carr, *Understanding the LRAD, the “Sound Cannon” Police Are Using at Protests, and How to Protect Yourself From It*, PITCHFORK (June 9, 2020), <https://pitchfork.com/thepitch/understanding-the-lrad-the-sound-cannon-police-are-using-at-protests-and-how-to-protect-yourself-from-it/> [<https://perma.cc/MVG6-JA7Y>].

<sup>186</sup> David Hambling, *Pentagon’s Non-Lethal SPECTER Could Be A Game Changer For Crowd Control*, FORBES (July 14, 2020), <https://www.forbes.com/sites/davidhambling/2020/07/14/pentagons-new-non-lethal-specter-is-a-game-changer-for-crowd-control/?sh=139977555316> [<https://perma.cc/T8XK-78BU>].

rope with small hooks at the ends that wrap around a person's legs.<sup>187</sup> Intended as a way to limit a person's movement without relying on pain, the BolaWrap could positively change the way that police interact with people who are under the influence of drugs or alcohol or in a mental health crisis—all without relying on pepper spray or firearms.<sup>188</sup> As an added benefit, the BolaWrap would not leave lingering chemicals after deployment. However, the BolaWrap may not completely escape chemical weapons. One successful use of the BolaWrap involved a subject flushed from a house with tear gas before being hit with the BolaWrap.<sup>189</sup>

The best innovations in policing are not physical. Several viable alternative policing strategies have emerged in recent years. One such strategy, Problem-Oriented Policing (POP), calls for officers to identify an issue in a community and then develop a strategy alongside community members to solve it.<sup>190</sup> POP has the benefit of improving relations between law enforcement and the community while also addressing areas that have comparatively high rates of crime.<sup>191</sup> Community Policing (CP) is another policing strategy that focuses on community orientation. CP emphasizes recruiting officers who are members of minority groups to reflect the communities they serve, identify problems on a local level, and work with residents and members of the community to respond to issues.<sup>192</sup>

Perhaps the most promising policing model is the Madison Method, named for the city in which it originated in the 1970s. The Madison Method is a style of crowd control that encourages police to respond softly, maintain communication with protesters, and avoid reliance on equipment and tools. The idea is that a crowd of protesters, seeing the police respond to their presence by donning flak jackets and riot shields, could be inflamed by the officer's show of force.<sup>193</sup> The Madison method places de-escalation above retaliation, and requires that officers re-imagine protesters as customers.<sup>194</sup>

The Madison Method represents a good starting point for an advance in policing not driven by the development of new tools to force compliance. During the 2020 racial justice protests, some police departments engaged in such peaceful strategies. Chief Kenneth Miller of the Petersburg Police Department in Virginia, along with a handful of his officers, joined a police brutality protest to show solidarity with the

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<sup>187</sup> Katie Mettler, *This Spider-Man-Like Lasso Is Marketed As A Policing Game-Changer. Some Aren't Buying It*, THE WASHINGTON POST (July 29, 2020), [https://www.washingtonpost.com/local/public-safety/bolawrap-police-enforcement-spiderman-lasso/2020/07/29/01160816-d018-11ea-9038-af089b63ac21\\_story.html](https://www.washingtonpost.com/local/public-safety/bolawrap-police-enforcement-spiderman-lasso/2020/07/29/01160816-d018-11ea-9038-af089b63ac21_story.html) [<https://perma.cc/T7VE-KWDN>].

<sup>188</sup> *Id.*

<sup>189</sup> *Id.*

<sup>190</sup> *Problem Oriented Policing in Depth*, RAND CORPORATION, <https://www.rand.org/pubs/tools/TL261/better-policing-toolkit/all-strategies/problem-oriented-policing/in-depth.html> [<https://perma.cc/M3FF-PC9J>] (last visited Mar. 4, 2021).

<sup>191</sup> *Id.*

<sup>192</sup> *Community Policing*, THE NAT'L POLICE FOUND., <https://www.policefoundation.org/projects-old/community-policing/> [<https://perma.cc/2VEG-SQ55>] (last visited Mar. 4, 2021).

<sup>193</sup> Mike Masterson, *Crowd Management: Adopting a New Paradigm*, LEB (Aug 1, 2012), <https://leb.fbi.gov/articles/featured-articles/crowd-management-adopting-a-new-paradigm#:~:text=Modern%20research%20supports%20a%20philosophy.gather%20and%20speak%20out%20legally> [<https://perma.cc/4K29-9NLT>].

<sup>194</sup> *Id.*

protesters and to foster a more positive community bond.<sup>195</sup> On another occasion, police officers in Oklahoma City took a knee to show their support for the protesters.<sup>196</sup> The previously tense crowd cheered for the officers.<sup>197</sup> Unfortunately, the media does not widely portray these successes. Rather than going largely unreported, the media should hold up these types of interactions as an example of how police departments can begin to bridge the gap between law enforcement officers and the community. As a basic policy matter, law enforcement's use of chemical weapons should replace chemical weapons with policing strategies such as POP, CP, and the Madison Method with the goal of building community bonds and protecting both people and the environment.

In this current age of deep divisions and festering grievances, a new style of policing that protects protester's civil rights, and treats protesters as people rather than "hostiles," could have a significant impact on local communities that have long struggled with distrust in law enforcement.

Protests are at the heart of a democratic society. The Constitution gives people the right to stand up in the street to air their grievances without fear of being gassed, pepper sprayed, or shot at with lasers, electric darts, or bolas. New technology aimed at quelling protests is only interested in having people go home; it does not have any interest in addressing the needs of the people or listening to the reason why they are on the streets in the first place. Crowd-control equipment will not reduce violence if police do not rethink how they interact with the larger community.

## VIII. CONCLUSION

The lack of regulation of chemical weapons in the U.S. has given weapons manufacturers carte blanche to put harmful chemicals in their products. Law enforcement has similarly had free rein to use these hazardous or undisclosed toxic chemicals on protesters. For decades, law enforcement agencies have abused their access to chemical weapons by unleashing tear gas indiscriminately on peaceful protesters. These abuses have led to lawsuits, but without federal regulation there is no path to true change. Local laws may help reduce the damage, but they do not protect fully and result in an inconsistent patchwork of policies across the U.S. Even the pleas of local legislators, who are generally better positioned than the public to institute change, will continue to go unheeded without support from the federal government. Without regulation, manufacturers will continue to add toxic chemicals, such as hexavalent chromium, lead salts, and methylene chloride to their products, which can cause serious and lasting damage to the human body and the environment.

To protect both protesters and the environment, the federal government must regulate the manufacture and use of chemical weapons. Ideally, the federal government will utilize the Spending Clause and make

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<sup>195</sup> Dewan, *supra* note 2.

<sup>196</sup> *Id.*

<sup>197</sup> *Id.*

the receipt of federal funding for law enforcement agencies dependent on states' prohibition of chemical weapons for crowd control purposes. In addition, the federal government should pass laws under the Commerce Clause that regulate the manufacturers by barring them from adding dangerous chemicals to their products. If the federal government enacts both solutions, states will have an incentive to not use chemical weapons on protesters and even if chemical weapons are used, they will not contain harmful chemical components.

Additionally, this regulation will benefit our society through a change in law enforcement strategies to move away from seeing protesters as enemies and towards seeing them as customers. Such a move would encourage law enforcement to establish good relationships with the community and peaceful dialogue with the citizens they are sworn to protect. In the long term, the regulation of chemical weapons will benefit both civilians and law enforcement agencies independently, as well as their relationship with each other, while also protecting the environment for future generations to come.