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Supplementary Information for Federal Agents Use ZnCl₂ Gas Against Black Lives Matter Protesters

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Other supplementary materials for this manuscript include the following:

Datasets S1 to S5

Supplementary Methods

Numbers of Police Brutality Incidents. I collected all incidents from the Police Brutality 2020 database (1) using their RESTful API (<https://api.846policebrutality.com/api/incidents>) via R v3.6.3 (2) with the httr v1.4.1 (3) and jsonlite v1.6.1 (4) packages. I collected all incidents during the May 25 to October 1 2020 interval, and specifically filtered Portland Oregon incidents. I also filtered the total and Portland incidents by chemical weapons tags using entries marked "gas", "marking-round", "pepper-ball", "pepper-spray", "spray", "tear-gas", or "tear-gas-canister", and then simply divided to determine ratios.

"Fed Out Time". I used timestamps from videos and augmented them with time-stamped or time-noting tweets as needed, to calculate the amount of time each night during July 2020 that the federal agents were outside of their buildings (5,6). Individual jaunts are in Data Set S3, collated daily-level data are in Data Set S1.

Crowd Size. I used the estimates provided by the news and social media aggregating site *The Recompiler*, which has a project (RE: Portland) that has collected documents of the Portland BLM protests since the end of June 2020, prior to the arrival of the DHS agents (6). On nights where a range was given, the midpoint was used. See Data Set S1.

Munition Identification. Protesters, concerned civilians, medics, legal observers, trash cleaners, scientists, and neighbors have been collecting munitions (e.g., Figs S1-25) since the beginning days of the protest. I leveraged this specifically to address the uncertainty around Hexachloroethane (HC) usage by connecting with the network of individuals already collecting and documenting munitions and notifying them of the particular can types of interest. In addition, I put out specific calls publicly for submissions of photos via Twitter and the Chemical Weapons Research Consortium website (<https://chemicalweaponsresearch.com>) via secure email and secure form, which have yielded dozens of submissions, but no additional HC cans beyond those included (Simonis, *personal observation*). The avenues remain open to submissions and I will update the data set used here with any further HC cans. I also watched hours of footage (5,6) and read through aggregated news and tweets (6) to investigate potential other deployments. Because HC cans are so distinctive when deploying and afterwards (Figs. 3, S1-S25, but note Fig. S9), it was possible to retroactively evaluate documentation and collections of munitions to enumerate the HC cans. If a can spewed sparks, off-gassed white/grey/black "smoke", and glowed and burned hot and long (~2 minutes), it was considered an HC can, due to the distinctive nature of its incendiary aspects (Fig. S27). Further, if any recovered can was so corroded to be illegible and was of the distinctive size of the HC cans (Figs. S1-24), it was considered as such. In the instance of the grenade in Fig. S9, it was identified as HC due to its clear labeling.



Fig. S1. Deployed hexachloroethane grenade 1: 16 July 2020, SW Madison closer to 3rd than 4th, not detonated, deployment not observed, recovered. (7).



Fig. S2. Deployed hexachloroethane grenade 2: 16 July 2020, SW 3rd between Madison and Jefferson, detonated, not observed deployed, recovered. (8,9).



Fig. S3. Deployed hexachloroethane grenade 3: 16 July 2020, Wyatt Federal Building, not detonated, observed deployed, not recovered. (10)



Fig. S4. Deployed hexachloroethane grenade 4: 16 July 2020, Wyatt Federal Building and down SW 3rd towards Main, detonated, observed deployed, not recovered. (11,12)



Fig. S5. Deployed hexachloroethane grenade 5: 17 July 2020, SW 3rd between Madison and Jefferson, not detonated, observed deployed, recovered. Photos by the author.



Fig. S6. Deployed hexachloroethane grenade 6: 17 July 2020, SW 3rd between Madison and Jefferson, detonated, observed deployed, recovered. Photos by the author.



Fig. S7. Deployed hexachloroethane grenade 7: 17 July 2020, SW 3rd between Madison and Jefferson, detonated, observed deployed, recovered. Photos by the author.



Fig. S8. Deployed hexachloroethane grenade 8: 19 July 2020, SW 3rd between Salmon and Main, not detonated, not observed deployed, recovered. (13)



Fig. S9. Deployed hexachloroethane grenade 9: 19 July 2020, unknown location, detonated, not observed deployed, recovered. Note the coloration and dimensions of the can (e.g., the rim shape and size) are distinct from the standard HC Military Style Maximum smoke whether unexploded (Fig. S1) or exploded (Fig. S7), suggesting perhaps a different run of product or a partial detonation. (14)



Fig. S10. Deployed hexachloroethane grenade 9: 20 July 2020, SW Main and 3rd, detonated, not observed deployed, recovered. Photos by @JesykaNoellex3, used with permission.



Fig. S11. Deployed hexachloroethane grenade 10: 20 July 2020, Lownsdale Square, detonated, not observed deployed, recovered. (15)



Fig. S12. Deployed hexachloroethane grenade 10: 20 July 2020, Lownsdale Square, detonated, not observed deployed, recovered. (16).

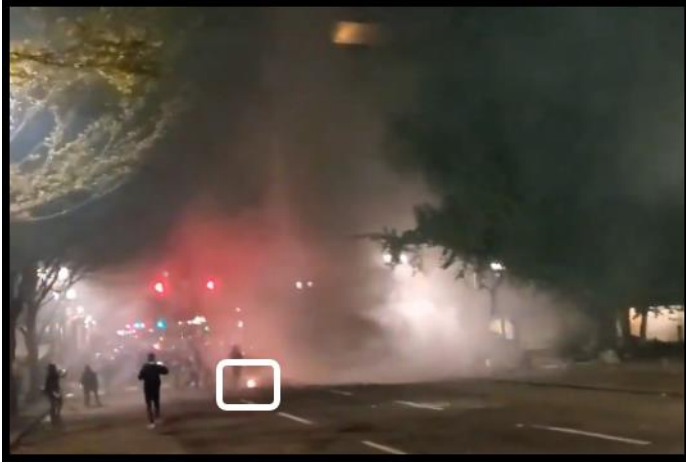


Fig. S13. Deployed hexachloroethane grenade 11: 23 July 2020, SW 4th near Salmon, detonated, observed deployed, not recovered. (17).



Fig. S14. Deployed hexachloroethane grenade 12: 25 July 2020, Hatfield Courthouse, not detonated, not observed deployed, recovered. Photos by anonymous recoverer. Used with permission.



Fig. S15. Deployed hexachloroethane grenade 12: 25 July 2020, Hatfield Courthouse, detonated, not observed deployed, recovered. (18).



Fig. S16. Deployed hexachloroethane grenade 14: 28 July 2020, SW 2nd and Salmon, detonated, not observed deployed, recovered. (19).



Fig. S17. Deployed hexachloroethane grenades 15 and 16: 28 July 2020, SW Salmon near 3rd, detonated, observed deployed, recovered. (20-22)



Fig. S18. Deployed hexachloroethane grenade 17: 28 July 2020, SW 3rd and Salmon, detonated, observed deployed, recovered. (23,24)



Fig. S19. Deployed hexachloroethane grenade 18: 28 July 2020, SW 3rd and Salmon, detonated, observed deployed, not recovered. (25)



Fig. S20. Deployed hexachloroethane grenade 19: 29 July 2020, SW 3rd near Salmon and Main, detonated, observed deployed, recovered. (26,27)



Fig. S21. Deployed hexachloroethane grenade 20: 29 July 2020, SW 4th and Main, detonated, not observed deployed, recovered. Photos by the author.



Fig. S22. Deployed hexachloroethane grenade 21: 29 July 2020, specific location unknown, detonated, not observed deployed, recovered. Photos by Nicholas Lee, used with permission.



Fig. S23. Deployed hexachloroethane grenade 22: 29 July 2020, specific location unknown, detonated, not observed deployed, recovered. Photo by anonymous collector. Used with permission.



Fig. S24. Deployed hexachloroethane grenade 23: 29 July 2020, SW Main near 4th, detonated, observed deployed, not recovered. (28).

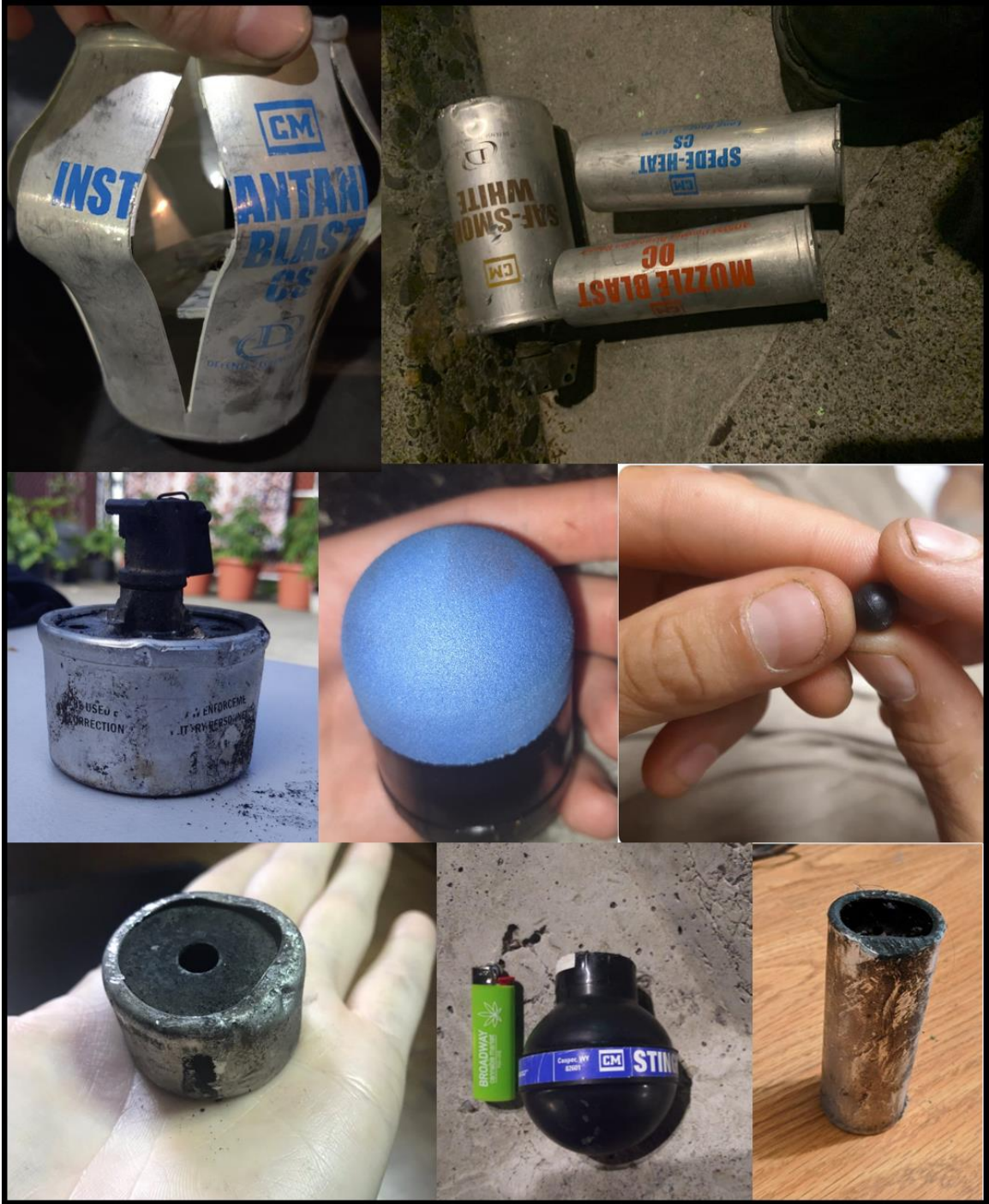


Fig. S25. Photos from a tweet thread collection of munitions prior to HC usage (29).



MAXIMUM COVERAGE HC SMOKE GRENADE

MILITARY STYLE – CONTINUOUS DISCHARGE



PRODUCT SPECIFICATIONS	
Diameter	2.36 in / 6.0 cm
Length	5.50 in / 14.0 cm
Fuse	M201A1 Type
Active Agent	N/A
Discharge Time	1.5 - 2 minutes
Launchable	Yes
Part No.	1083
Warranty	5 years from date of manufacture

ALL SPECIFICATIONS ARE AVERAGES AND SUBJECT TO CHANGE

The Military Style Maximum Smoke Grenade is a slow burning, high volume, continuous discharge grenade that emits a grey-white smoke.

Hexachloroethane (HC) smoke is discharged through four (4) gas ports located on top of the canister. Due to the high metal content, HC smoke is dark in comparison to Sal-Smoke™ that is utilized in all other Defense Technology® smoke devices (except the Large-Style Maximum Smoke Grenade). It is similar to the military-style grenade and incorporates a steel canister.

Designed specifically for outdoor use in crowd management situations, the Maximum Smoke Grenade is a high volume, slow burning device that deploys large quantities of grey-white colored smoke for approximately 1.5 to 2 minutes. Due to its extremely long burn time, it is subject to throw-back by individuals wearing burn protection such as a welder's mitt. The canisters may be protected from advancing individuals with the use of less lethal impact munitions. The device should be deployed utilizing wind advantage.

It can be utilized as a carrying agent (multiplier) for smaller OC, CN or CS munitions, or for concealing the movement of agency personnel. It may also be used as a distraction to focus attention away from other activities.

It should NOT be deployed onto rooftops, in crawl spaces, or indoors due to its fire-producing capability. Hand throw or launch. Launching of grenades will provide deploying officers additional stand-off distances. Affords MAXIMUM COVERAGE AND BURN TIME and is excellent for large outdoor areas.

Due to the nature of Hexachloroethane (HC), agencies should refer to the MSDS sheet listed on the Defense Technology® Web site or call customer care.



WARNING

This product can expose you to chemicals including Lead Salts and Hexavalent Chromium, which are known to the State of California to cause cancer, and Lead Salts, which are known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

WARNING: THIS PRODUCT IS TO BE USED ONLY BY AUTHORIZED AND TRAINED LAW ENFORCEMENT, CORRECTIONS, OR MILITARY PERSONNEL. THIS PRODUCT MAY CAUSE SERIOUS INJURY OR DEATH TO YOU OR OTHERS. THIS PRODUCT MAY CAUSE SERIOUS DAMAGE TO PROPERTY. HANDLE, STORE AND USE WITH EXTREME CARE AND CAUTION. USE






Fig. S26. Product photo and specification sheet for Defense Technology Military-Style Maximum Smoke HC Grenade (30).

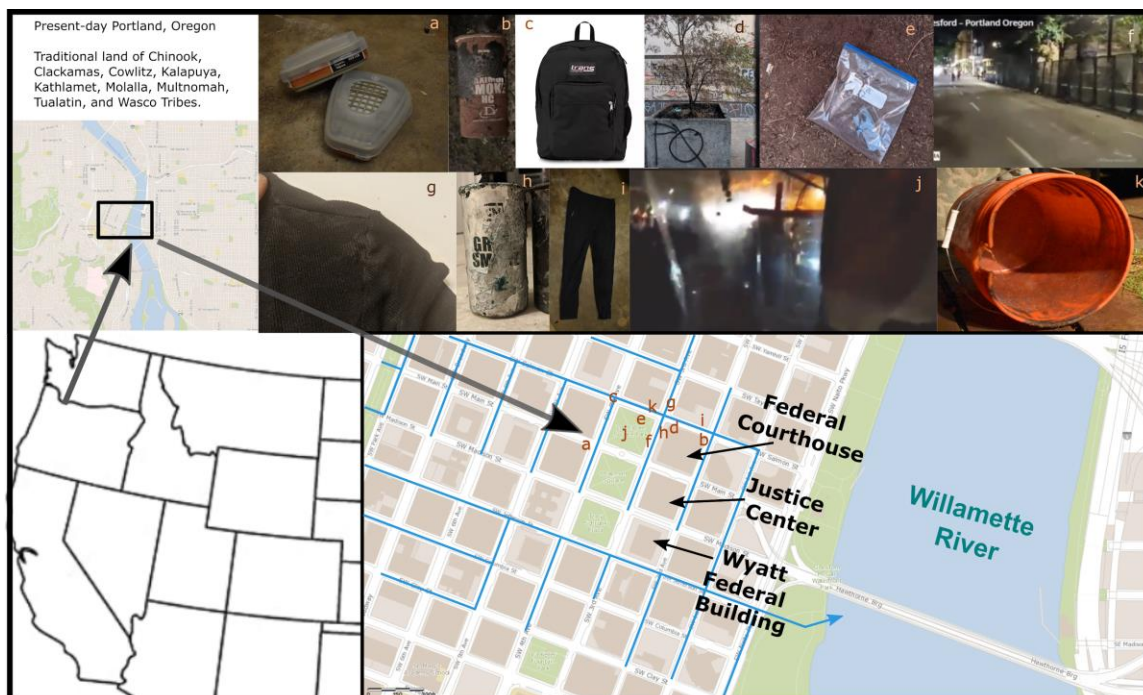


Fig. S27. Sample locations and pictures for the 11 environmental chemistry samples taken around the downtown area of present-day Portland, OR. (a) medic filter: filter medium from a NIOSH Organic Vapors DMA 6001 filter set worn by a medic only on 2020-07-27, 2020-07-28, 2020-07-29 in the area of SW 4th and Main. Medic only brought out mask when chemical weapons were used and always positioned themselves outside of the visible plume to treat individuals as they came out. (b) HC Can: dust/particle residue from inside Defense Technology Hexachloroethane (HC) Smoke can deployed and recovered post “completion” on 2020-07-28 night into 2020-07-29 (#14 in Appendix 1 Dossier). (c) A’s backpack: Cut out from a black Jansport backpack that was worn by a protester the night of 2020-07-23 and prepped for sampling thereafter. (d) 3rd and Salmon Plants: shrub within the fence at the Federal Courthouse and Tree at the corner of Lownsdale, samples taken 2020-07-27 night after a bleach smell was noticed and 2020-07-28 during the following daytime. (e) Lownsdale Surface Soil SW 3rd and Salmon: Scoop of topsoil from the NE corner of the park taken 2020-07-28 midday. (f) SW 3rd Street: samples of paper and other refuse on the street in front of the Federal courthouse on 3rd near Salmon from immediately after a bleach smell was noticed 2020-07-27 into 2020-07-28. (g) E’s Shirt: water taken from a soak of a shirt worn by a protester on 2020-07-26 into 2020-07-27, with noticeable bleach-like smell and visible loss of coloration. (h) Green Smoke: dust/particle residue from inside Defense Technology Green Smoke canister deployed and recovered post “completion” on 2020-07-28 into 2020-07-29. (i) S’s Leggings: water taken from a soak of leggings worn by protester recovering spent canisters 7-28 into 7-29. (j) Witches’ Tent: passive sample taken from existing cotton rounds, paper towels, etc that were present in the Witches’ medical tent in Lownsdale the night of when the tent reeked of bleach 2020-07-26. <https://twitter.com/Cascadianphotog/status/1287714834893565952>. (k) Spicy Bucket Scrape: residue scraped from inside of a Home Depot 5 gallon bucket used to cover smoke and gas canisters during 2020-07-27 and 2020-07-28 nights.

Table S1. Date, classifications, and locations for all 23 HC grenades recorded (Figs. S1-24).

id	date	observed	recovered	detonated	location
1	2020-07-16	0	1	0	madison closer to 3rd than 4th
2	2020-07-16	0	1	1	3rd btwn madison and jefferson
3	2020-07-16	1	0	0	wyatt
4	2020-07-16	1	0	1	wyatt and down 3rd towards main
5	2020-07-17	1	1	0	3rd btwn madison and jefferson
6	2020-07-17	1	1	1	3rd btwn madison and jefferson
7	2020-07-17	1	1	1	3rd btwn madison and jefferson
8	2020-07-19	0	1	0	near side of the parks
9	2020-07-19	0	1	1	Unknown
10	2020-07-20	0	1	1	main and 3rd
11	2020-07-20	0	1	1	lownsdale
12	2020-07-21	0	1	1	salmon and 3rd
13	2020-07-23	1	0	1	4th near salmon
14	2020-07-25	0	1	0	around courthouse (fence was torn down)
15	2020-07-25	0	1	1	around courthouse (fence was torn down)
16	2020-07-28	1	1	1	2nd and salmon
17	2020-07-28	1	1	1	salmon between 3rd and 4th
18	2020-07-28	1	1	1	salmon between 3rd and 4th
19	2020-07-28	1	1	1	salmon and 3rd
20	2020-07-28	1	0	1	salmon and 3rd
21	2020-07-29	1	1	1	3rd between salmon and main
22	2020-07-29	0	1	1	4th and main
23	2020-07-29	0	1	1	unknown
24	2020-07-29	0	1	1	unknown
25	2020-07-29	1	0	1	main between 4th and 5th

Dataset S1 (summary_data.csv). Daily data used in the analyses.

Dataset S2 (analytical_chemistry.pdf). Full analytical chemistry report.

Dataset S3 (fed_presence.xlsx). Jaunt-by-jaunt time stamps and total time out for each instance where the federal agents left their buildings during July 2020.

Dataset S4 (functions.R). R (2) functions used in analyses.

Dataset S5 (analyses.R). R (2) code used to conduct analyses.

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