

Letter Health Consultation

Evaluating Lead Air Monitoring Data near the

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

EPA FACILITY ID: VA1210020730

DECEMBER 13, 2018

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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Prepared By:

U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations



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Atlanta GA 30333

December 13, 2018

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Virginia Dept. of Environmental Quality
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RE: Lead air monitoring near the Radford Army Ammunition Plant, Virginia

Dear Mr. Jennings and Mr. Scott:

Thank you for working with the Agency for Toxic Substances and Disease Registry (ATSDR) over the past several years as we evaluate community concerns related to potential exposures from the Radford Army Ammunition Plant (RFAAP) near Radford, Virginia. As you know, ATSDR evaluated potential exposures from the water pathway in a 2015 report. Community members had also asked ATSDR to evaluate their potential air exposures from open burning activities at RFAAP, but no air sampling data were available at that time.

Last year, the Virginia Department of Environmental Quality (VDEQ) began collecting off-site ambient air samples for lead analysis. ATSDR reviewed these data and concludes that the lead concentrations in ambient air are far below ambient air standards and would not be expected to cause any harmful health effects for community members. The remainder of this letter describes the events and on-site sampling that prompted the lead-specific sampling and details how ATSDR reached its conclusions.

ATSDR supports recent and planned efforts to minimize air releases from open burning. We remain available to give public health input on site questions or comment on additional data, upon request. We will be sharing a copy of this letter with our community distribution list so the public is aware of our conclusions.

Background

RFAAP is a U.S. Army facility near Radford, Virginia, that manufactures nitroglycerin and nitrocellulose used in munitions and other products. Most of the waste materials from processing activities are treated in two on-site incinerators, but some wastes cannot enter the incinerator due to reactivity issues. These wastes are disposed of at the open burning ground, located along the New River and consisting of 8 pads of 2 pans each where wastes are ignited and burned (see Figure 1 for the general location of the open burning ground). The resulting ash materials are removed for off-site disposal.

The facility conducts open burning of two types of waste. *Dry propellant* burns consist of MK-90 rocket motors. *Skid burns* contain a combination of energetic material, soil, gravel, and other debris. Skid burn waste is placed on wooden skids along with securing materials and diesel fuel to promote burning.

In 2012, community members asked ATSDR to evaluate all types of community exposures to contaminants released by RFAAP. ATSDR released a health consultation in 2015 focusing on water-related exposures.¹ This report found that contaminants released into water from RFAAP were not affecting public or private drinking water in the area. Throughout development of the 2015 report, the community also expressed ongoing concern about potential air exposures, particularly from open burning, but a lack of air sampling data precluded ATSDR from evaluating those exposures. Since 2015, ATSDR has continued to look for ways to address community concerns related to air exposures and has conveyed our intention to evaluate air sampling data, if they became available in the future.

The facility's open burning ground operates under a RCRA permit. Burn rates were specified based on (1) generic "bang box" emission factors describing the amount of contaminants released into the air from waste during open burning and (2) modeling of the distribution of these releases to the surrounding community. These are accepted methods for determining permit requirements for open burning to protect communities from harmful releases, and the facility was not required to conduct any air sampling or monitoring of its open burns. However, ATSDR suggested that air sampling to either characterize site-specific air releases from open burning or to verify predicted low contaminant concentrations in community locations could address ongoing community concerns about exposure.

In September-October 2016, the RFAAP facility, working with the U.S. Environmental Protection Agency's Office of Research and Development and the National Aeronautics and Space Administration, demonstrated a new drone sampling technology with a goal of developing site-specific emission factors for open burning. The site-specific emissions factors from the drone sampling (published in a 2017 final report²) were mostly similar to generic emission factors. However, the emission factor for lead released from dry propellant burns was higher than had been predicted, suggesting a potential for excess lead release from open burning of MK-90 motors.

¹ ATSDR. Health consultation for Radford Army Ammunition Plant; Radford, Virginia; Evaluation of potential for chemicals released to groundwater or surface water to affect drinking water in the nearby community. January 28, 2015.

² Aurell J, Gullett, B. Characterization of air emissions from open burning at the Radford Army Ammunition Plant. August 23, 2017.

Two actions followed after this finding. First, VDEQ set up off-site ambient air monitors (one primary and one back-up) in between the open burning ground and a nearby elementary school to measure actual off-site lead concentrations in air. The monitors began operation in October 2017 and are still operating.³ They collect one 24-hour sample for lead analysis every six days, similar to other ambient monitors in Virginia. Second, RFAAP applied for a permit modification which allows them to treat the MK-90 motors in such a way that they can enter the on-site incinerator, avoiding open burning. This modification was approved by VDEQ in Spring 2018.⁴

Figure 1 shows the relationship between the open burning ground, ambient air monitors, and school. Also shown in Figure 1 are the two closest regional airports for which wind speed and direction data are available. The open burning ground is approximately midway between the New River Valley Airport in Dublin and the Blacksburg Virginia Tech Airport in Blacksburg. Because a greater number of topographic features exist between RFAAP and Blacksburg, ATSDR considered the New River Valley wind data more likely to represent wind data in the vicinity of RFAAP.

To allow time for a sufficient amount of data to be collected, ATSDR waited approximately six months before initiating our evaluation of the ambient data.

Discussion

ATSDR examined the following information and data:

- Results provided by VDEQ on lead in ambient air from October 4, 2017 through June 25, 2018.⁵ The data included laboratory data and quality control information.
- Information provided by RFAAP on dates and types of open burn events from October 1, 2017 through August 20, 2018.⁶
- Wind speed and direction data at the New River Valley Airport in Dublin, Virginia from October 1, 2017 through July 29, 2018.⁷

³ Data from the monitors are posted quarterly on VDEQ's website at <https://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant/RAAPAirEmissions.aspx>.

⁴ Personal communication, Ashby Scott of VDEQ to Jill Dyken of ATSDR, 7/25/2018.

⁵ Provided via emails from Namita Verma of VDEQ to Jill Dyken of ATSDR dated 7/24/2018, 12/17/2018, and 8/29/2018.

⁶ Provided via email from Len Diloia Jr. of RFAAP to Jill Dyken of ATSDR dated 8/17/2018.

⁷ ATSDR staff obtained hourly averaged standard wind speed and wind direction using surface meteorology in TD3505 format downloaded from <https://www1.ncdc.noaa.gov/pub/data/> for the New River Valley Airport; upper air data in FSL format downloaded from <https://ruc.noaa.gov/raobs/>; and national land use data downloaded from <https://www.mrlc.gov/viewer.js>. The data were processed using EPA's AERMET version 18081 to check the data quality and calculate time-averaged wind speed and wind direction.

Figure 1. Map showing location of RFAAP open burning ground in relation to VDEQ air monitors, nearest school, and two regional airports



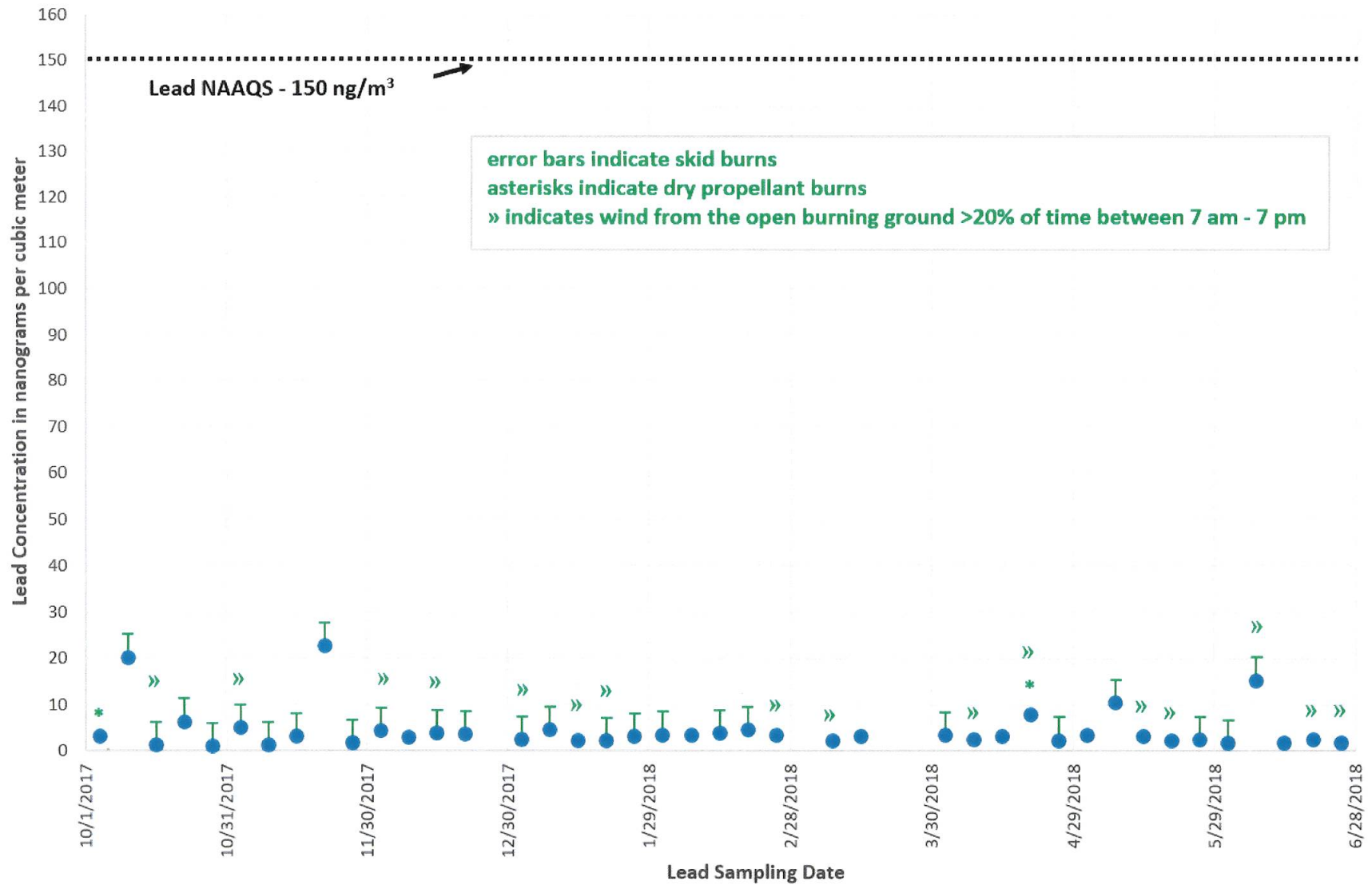
Figure 2 presents a visual summary of the data evaluation. Each lead result is shown with a marker indicating whether open burning was conducted on that date, and if so whether it was a skid burn or a dry propellant burn. Small arrows (>>) next to each result indicate if winds were generally from the direction of the open burning ground on the date of sample collection. (ATSDR considered winds to be generally from the open burning ground if wind direction was from the west-northwest, northwest, or north-northwest at least 20% of the time between the hours of 7:00 am and 7:00 pm, when open burning might take place.)

From Figure 2, ATSDR observes that

- All of the 24-hour lead results were far below the National Ambient Air Quality Standard (NAAQS) for lead of 150 nanograms per cubic meter (ng/m^3) for a three-month average. The NAAQS for lead was developed to protect small children from decreases in intelligence quotient scores caused by high blood lead levels (considered the most sensitive effect). Although there is no known safe level of lead in blood, the levels of lead in ambient air measured near RFAAP are unlikely to increase blood lead levels in nearby children to a measureable extent. Therefore, community health effects are unlikely.
- Several samples were collected on days when burns were conducted and winds were generally from the direction of the open burning ground, and two samples were conducted during dry propellant burns. No correlation is evident between type of burn or wind direction with the low measured lead concentrations in air. It is unlikely that the intermittent sampling strategy, over this period of time, would have failed to capture at least some days of high lead releases, if they occurred regularly.

In addition, the open burn data provided by RFAAP confirmed that since May 2018, no dry propellant (MK-90) burns have been conducted. Even if this type of burn had resulted in high lead releases that were not captured, that potential is now removed.

Figure 2. Ambient air monitoring near Radford Army Ammunition Plant, lead results October 2017-June 2018



In summary, ATSDR concludes that community air exposures to lead from RFAAP are not likely to result in harmful effects on public health in the community at this time. It is our understanding that RFAAP is exploring even more ways to reduce the amount of waste that must undergo open burning. We support these efforts as a way to assuage community concern with the open burning method as well as reduce uncontrolled releases to the environment.

We plan to provide a copy of this letter to our RFAAP e-mail distribution list so the community is aware of our findings.

Your organizations' cooperation in providing data and additional information was instrumental in our evaluation. Thank you. ATSDR remains available to give public health input on site questions or comment on additional data, upon request. If we can be of further assistance, please contact Jill Dyken (770-488-0768 or JDyken@cdc.gov) in Atlanta or Lora Werner (215-814-3141 or lkw9@cdc.gov) in our Philadelphia office.

Sincerely,

A handwritten signature in blue ink that reads "Jill J. Dyken". The signature is fluid and cursive, with the first and last names being more prominent.

Jill J. Dyken, PhD, PE
Environmental Health Scientist
Eastern Branch
Division of Community Health Investigations

cc:

Dwight Flammia, Virginia Department of Health
Ann Regn, Virginia Department of Environmental Quality
Erich Weissbart, U.S. Environmental Protection Agency
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For email distribution to community list