SUMMARY OF COMMENTS

General Information

V. ADDENDUM TO TITLE V PERMIT STATEMENT: SUMMARY OF COMMENTS

Facility Name:	Holston Army Ammunition Plant	(HSAAP Area B)
City:	Kingsport	
County:	Hawkins	- · · ·

Date Application Received:	December 23, 2013
Date Application Deemed Comp	lete: October 24, 2014
Date of Public Notice:	May 18, 2016
Date of Public Hearing Notice:	July 8, 2016
Date of Public Hearing:	August 18, 2016

Emission Source Reference No.:	37-0028
Permit No.:	568188

For Public Hearing

Hearing Officer:	Mark Braswell, Johnson City External Affairs Director for Tennessee Department Environment and Conservation
Other Division of Air Pollution Control (DAPC) Representatives:	Johnson City Environmental Field Office (JCEFO): Amanda Davis, Manager, Ronnie Wilhoit, Environmental Specialist Nashville Central Office: Jimmy Johnston, Deputy Director, Will Collins, Manager, Moe Baghernejad, Environmental Protection Specialist (EPS)
Company (Holston Army Ammunition Plant) Representatives	Ray Brane, Holston Army Ammunition Plant, Bob Winstead, Environmental Manger, BAE Systems Ordnance Systems Inc., Billy Shelton, BAE Systems Ordnance Systems Inc., James E. Ogle, Environmental Affairs Specialist-Air, BAE Systems Ordnance Systems Inc.
Public attendance:	16 persons signed the hearing registration sheet

Overall Comment Summary

The following is the Tennessee Department of Environment and Conservation (TDEC) Tennessee Division of Air Pollution Control (TDAPC) response to comments made during the public hearing held on August 18, 2016, regarding the draft Title V Operating Permit (568188) for Holston Army Ammunition Plant (HSAAP), BAE Systems Ordnance Systems Inc. at 4509 West Stone Drive, Kingsport. The oral and written comments received regarding the draft permit are included in this document.

At the hearing there were three verbal comments recorded. There were also one written comments from an individual who did not give oral comments. The hearing officer allowed an additional 10 days to receive written comments. There were two hundred two (202) additional comments received.

In the "General Themes" section, below, the Division provides a summary of issues that were raised by multiple commenters and provides responses to these comments.

The response to each comment is also provided in the table below. The Division's response to an individual comment may refer back to a general theme section of this document. Specific questions are answered where appropriate.

Not all of the comments addressed the content of the draft Title V permit. However, all comments were addressed as a matter of Division policy. The Division is not obligated to respond to comments, only to consider comments in evaluating a permit issuance. However, the Division as a matter of policy makes available a comment/response summary. The summary, in turn, becomes a part of the permit record and is included with the proposed permit that goes to EPA for review.

General Themes

Title V Permit

Title V of the Clean Air Act requires major stationary sources of air pollutants, and certain other sources, to obtain and operate in compliance with a Title V major source operating permit. The Clean Air Act and Tennessee regulations require the responsible official of a Title V source to certify compliance with all applicable requirements of their Title V permit at least annually with a truth and accuracy statement.

Sources that have the potential to emit at or above the major source threshold for air pollutants are required to have a Title V permit. The major source threshold for any regulated air pollutant is 100 tons/year. Major source thresholds for hazardous air pollutants (HAP) are 10 tons per year for a single HAP or 25 tons per year for any combination of HAP. HSAAP is subject to the Title V permit program because their potential-to-emit emissions of PM (particulate matter), SO₂ (Sulfur Dioxide), VOC (volatile organic compounds), NO_x (nitrogen oxides), and CO (carbon monoxide) are each greater than 100 tons per year.

The basic components of a Title V permit are the approved permit application, the permit record and the permit itself which specifies all the pollution control requirements from federal or state air pollution control regulations that apply to a source.

Opposition to the Issuance of the Permit

The decision to issue or deny a permit application is not discretionary. If an applicant meets the standards set forth in Tennessee Air Pollution Regulations, the agency must issue a permit.

The Department cannot make permitting decisions based on community approval or disapproval of the company/facility or make permit decisions based on the number of individuals or groups that support or oppose a project. The Department's decision is based on the technical review of an applicant's application and the regulatory requirements in place at the time of the review. If it appears that the applicant can fulfill these requirements a permit is issued. Sometimes, emission testing is required in the permit as part of proving that the applicant can and does meet the emission standards.

The Department issues permits that require compliance with all current applicable standards and regulations set by the EPA (Environmental Protection Agency) and TDAPC (Tennessee Division of Air Pollution Control).

Health Impacts to Sensitive Individuals

In order to receive an air quality permit, the facility must demonstrate that they are in compliance with air quality standards set by the Environmental Protection Agency (EPA) and Tennessee Division of Air Pollution Control (TDAPC). The Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of ambient air quality standards: 1-primary standards to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly, and 2-secondary standards to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants: particulate matter, nitrogen dioxide, sulfur dioxide, ozone, carbon monoxide and lead. The NAAQS are reviewed at the federal level every 5 years and updated as necessary so that concerns regarding the health of sensitive individuals and protection of welfare are incorporated into air quality requirements.

Facility's Accountability to Kingsport Citizens

Most of the comments received oppose to open burning of explosive and explosive-contaminated and or potentially explosive contaminated as a safe alternative.

The open burning of non-radioactive, explosive, shock sensitive, chemically unstable, or highly reactive wastes, packaging, or contaminated or potentially contaminated combustible materials at Holston Army Ammunition Plant (HSAAP) is currently allowed at HSAAP facility pursuant to the open burning prohibition exception found at Tennessee Air Pollution Control Regulation 1200-03-04-.04(k).

(k) Fires consisting solely of non-radioactive, explosive, shock sensitive, chemically unstable, or highly reactive wastes, packaging, or contaminated or potentially contaminated combustible materials. Priming materials used to facilitate such burning shall be limited to #1 or #2 grade fuel oils, and wood waste. The provisions of Rule 1200-3-4-.03(4) as it pertains solely to "other rubber products" and "other plastics" are waived for this exception. Open burning conducted under this exception is only allowed where no other safe means of disposal exists.

The Division of Air Pollution Control (DAPC) acknowledges that the U.S. Department of the Army is reviewing safe alternatives to minimize the open burning of these materials. On July 24, 2017, BAE Systems Ordnance Systems Inc., the operating contractor for Holston Army Ammunition Plant (HSAAP), certified that there are no proven safe alternatives to open burning of HSAAP explosives and explosives contaminated material along with supporting supplemental material. In addition, the proposed permit requires that "The facility shall review available information related to alternatives to open burning of explosives and explosive-contaminated and or potentially explosive contaminated combustibles annually, and submit a statement signed by the Responsible Official certifying whether or not there are safe alternatives to open burning these materials. In the event a safe alternative is discovered, the statement shall include a plan and schedule to implement the new method of disposal explosive contaminated materials and explosive waste".

Proposed Changes to the Draft Title V Permit for Open Burning Sources Based on Comments Received from the Public Hearing

Three additional conditions for open burning sources at HSAAP are as follows:

- The open burning of materials, handling and disposal of ash and other waste generated from this burning process must be conducted in accordance with all applicable Tennessee Division of Solid Waste Management regulations. TAPCR 1200-03-09-.03(8)
- 2. The permittee shall not open burn demolition debris, or any other materials, that contain PCBs (e.g., pumps, motors, painted piping, painted masonry or wood, caulking, waste oil, etc.) without the permission of the United States Environmental Protection Agency (EPA).

Letter from Jon D. Johnston, Chief, Materials and Waste Management Branch, Resource Conservation and Restoration Division, EPA Region 4, dated March 25, 2016, enclosed as attachment 24 to the proposed draft permit. TAPCR 1200-03-09-.03(8)

3. The facility shall review available information related to alternatives to open burning of explosives and explosive-contaminated and or potentially explosive contaminated combustibles annually, and submit a statement signed by the Responsible Official certifying whether or not there are safe alternatives to open burning these materials. In the event a safe alternative is discovered, the statement shall include a plan and schedule to implement the new method of disposal explosive contaminated materials and explosive waste. The statement shall be submitted by March 1st of each year beginning March 1, 2019. TAPCR 1200-03-04-.04(1)(k), TAPCR 1200-03-10-.02(1)(a)

Summary of Comments:

Commenter:	Renee Hoyus, Director of Tennessee Clean Water Network

The following comment was submitted by Renee Hoyus at the hearing (via oral presentation and submittal of a copy of the Tennessee Clean Water Network) and submitted via email on June 13, 2016:

Comment:

"1. HAAP will permanently cease the open burning of demolition debris or any other material suspected of containing PCBs.

TCWN requests both permits strictly prohibit the burning of any materials that may contain PCBs. EPA's letter specified demolition debris (including pumps, motors, painted piping, painted masonry or wood, caulking), but the permits should clearly state any materials suspected of containing PCBs are ineligible for open burning."

"2. HAAP will evaluate alternate decontamination methods for materials characterized by PCBs.

The permits should note HAAP must evaluate alternate decontamination methods for those material considered to contain PCBs prior to disposal in the landfill. Should HAAP not find an alternative method, EPA will be consulted."

"3. HAAP will eliminate PCB characterized material from existing burn pile.

HAAP agreed to deconstruct and sort through the existing burn pile for PCB suspected items. If this has not already been completed, it should be required in these permits. The permits should specify that analytical testing will determine the proper disposal technique of any materials found to contain PCBs."

"4. Potentially contaminated oil will be tested.

The permits should require any oils potentially contaminated with explosive residue to be tested for PCBs before burning. If found to contain PCBs these oils will be disposed via an alternative method."

Ms. Hoyus requested that TDEC hire an expert to evaluate the claim by HAAP that there is no safe alternative to open burning exist.

A copy of the letter submitted by Renee Hoyus is attached to this Summary of Comments document (see Attachment 1). The concerns described in the document are addressed as follows:

Response:

The general themes section includes a response to this concern. Part of Ms. Hoyus' recommendations/suggestions is included in the proposed draft permit.

Commenter:	Judge Mark Toohey

Comment(s):

Judge Toohey's detailed comments received by the Division on August 17, 2017, are as follows:

Comments on Title V Draft Renewal Permits 568191 & 568188 for Holston Army Ammunition Plant (HSAAP)

1. Duty to Fully Disclose Alternative Treatment Technologies

"In accordance with TAPCR 1200-3-4-.04(1)(h), an exception to open burning may be approved where "there is no other practical, safe, and/or lawful method of disposal. Documentation demonstrating why the general open burning regulations cannot be met must be submitted." TAPCR 1200-3-4-.04(1)(k) states that "Open burning conducted under this exception is only allowed where no other safe means of disposal exists." Furthermore, TAPCR 1200-3-4-.04(2) states "The Technical secretary reserves the right to require a person to cease or limit open burning if emissions from the fires are deemed by the Technical Secretary or his designee to jeopardize public health or welfare, create a public nuisance or safety hazard, create a potential safety hazard, or interfere with the attainment or maintenance of the air quality standards."

HSAAP's current Title V permit states:

"A6. Submittal of Requested Information The Permittee shall furnish to the Technical Secretary, within a reasonable time, any information that the Technical Secretary shall request in writing to determine whether cause exists for modifying, revoking and reissuing, or termination of the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Technical Secretary copies of records required to be kept by the permit. If permittee claims that such information is confidential, the Technical Secretary may review that claim and hold the information in protected status until such time that the Board can hear any contested proceedings regarding confidentiality disputes. If the information is desired by EPA, the permittee may mail the information directly to EPA. Any claims of confidentiality for federal purposes will be determined by EPA.

TAPCR 1200-3-9-.02(11)1(vi)(V)."

"On July 13,2012, R.E. Winstead, Environmental Manager of BAE/HSAAP authored a letter, with the approval of HSAAP staff which purported to fully respond to an inquiry made by Tennessee Department of Environment and Conservation (TDEC) concerning reasonable alternatives to open burning explosive waste at HSAAP. (See Exhibit 1) In the letter, Mr. Winstead stated, The explosives waste that has the fewest emissions appears to have other safe alternatives to open burning." Although the letter appeared to be referring to the hazardous waste open burned in the RCRA burn pan unit, the letter does not make specific reference to that unit. The letter also failed to identify the alternatives available for that type of explosive waste. Mr. Winstead also stated that overall a total of 5 commercially available technologies were evaluated, but he failed to identify the technologies he was referring to. instead, he referenced a March 2012 report, ERDC/EL TRL2-8 entitled "Alternative Treatment Options for Open Burning of Explosive Waste at Holston Army Ammunition Plant". Since then, despite repeated requests to make the report available to TDEC, EPA, and others, the army has failed to produce the document, claiming that it is proprietary information which is only authorized for distribution to U.S. Government agencies (See Exhibit 2). The army's classification of this document is: UNCLASSIFIED."

"Given the fact that HSAAP admits that there "appears to be other safe alternatives to

open burning" for at least one of the explosive waste streams located at HSAAP, it appears that both federal and state laws prohibit the use of open burning to treat that waste. To the extent that military personnel are ordered to engage in open burning of this waste, it places them in the position of either disobeying a direct order or potentially violating the law. It is therefore prudent and legal for the Tennessee Department of Environment and Conservation to refuse to permit the continued open burning of the explosive waste referred to in Mr. Winstead's letter, and to refuse to allow any open burning to take place unless and until HSAAP complies with its obligations under its current permit to submit the requested report and any additional information required by TDEC or EPA. We request that the Tennessee Board of Air Pollution Control and the EPA make a formal determination as to the validity of the army's claim that the report contains confidential proprietary information which renders it unavailable to the public."

2. Duty to Use Alternative Treatment Technologies

"In accordance with TAPCR 1200-3-4-.04(l)(h) (Tennessee law), an exception to open burning may be approved where "there is no other practical, safe, and/or lawful method of disposal. Documentation demonstrating why the general open burning regulations cannot be met must be submitted." TAPCR L2OO-3-4-.04(1)(k) also states that "Open burning conducted under this exception is only allowed where no other safe means of disposal exists."

"Likewise, under 40 CFR 5265.382, (Federal Law), "open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment..."

Holston Army Ammunition Plant at Kingsport, TN.

"The open burning area for waste explosives and explosives-contaminated material and potentially explosives-contaminated material at Holston Army Ammunition Plant is located approximately 0.85 miles from the closest facility boundary and approximately 1.5 miles from the closest resident, according to BAE Systems Ordnance Systems Inc. (OSI) - the operating contractor for Holston Army Ammunition Plant. The base is located at the confluence of the North and South Forks of the Holston River at Kingsport, Tennessee. Roughly 1,672 people live within one mile of the facility. (See Exhibit 15). Statistically, it can be inferred that approximately 100-134 of these residents suffer from asthma. Domtar Paper Company and Eastman Chemical Company are located roughly 3 and 5 miles, respectively from Holston Army Ammunition Plant. These industries emit a host of air pollutants which travel into the communities located near the open burning site, A portion of the area surrounding Eastman Chemical Company is out of compliance for Sulphur dioxide emissions. According to a 2009 USA Today report, which used EPA data submitted by industry, air modeling and ambient air testing, Kingsport City Schools are subjected to more toxic air pollution than 98-99% of 127,809 schools studied throughout the United States. For example, only 41 out of 127,809 schools across the U.S. had worse air pollution than Johnson Elementary School. Jackson Elementary School, which is roughly 3 miles from Holston Army Ammunition Plant was ranked in the top 1% of the worst schools in the nation for air pollution. According to the report, the 3 industries primarily responsible for the air pollution are Eastman Chemical Company, Weyerhauser (now Domtar)and Holston Army Ammunition Plant. (See Exhibit 3)"

"Concepts of environmental justice require TDEC and EPA to consider relevant public health and industry data concerning the potential for multiple exposures or cumulative

exposure to human health or environmental hazards in our affected population as well as historical exposure to environmental hazards. Cumulative impact is defined as " the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (See 40 CFR 1508.7). We submit that the air pollution from these three industries creates significant short-term and long-term cumulative impacts on the air quality of the neighborhoods surrounding HSAAP. Continuing to allow the addition of unmonitored hazardous air pollutants into the atmosphere through open air burning at HSAAP threatens our short and long term health and well-being, as well as continuing what is readily identifiable as a public nuisance."

"In December 2011, after a complaint from an area resident, officials with the Tennessee Division of Air Pollution Control reported observing ground level smoke from HSAAP lingering in the general area, impacting local air quality. On multiple occasions and as recently as June, 2016 community members have reported and photographed ground level smoke in neighboring residential areas that coincides with open burning at HSAAP. These observations indicate that residents are at risk for exposure to emissions from open air burning. It is also reasonable to expect that populations in closer proximity to the various source areas at HSAAP, such as onsite workers and other personnel, are at increased risk for exposure to the uncontrolled release of pollutants from open air burning and thermal treatment activities."

"There are three main types of wastes that are burned at Holston, according to OSI. The first is bulk raw explosives that have become contaminated through contact with the manufacturing floor or out-of-spec product unsuitable for use or reprocessing. This waste is burned normally each week in open burn pans pursuant to a Resource Conservation and Recovery Act (RCRA) hazardous waste permit."

"The second type of waste consists of explosives-contaminated small articles such as plastic bags, paper towels, filters, personal protective equipment, and dewatering filter socks. This material is placed in a steel cage and is generally burned once a week even though it is permitted daily. This waste is burned in non-RCRA units pursuant to a Title V Permit only. It is unclear whether these items are contaminated or only potentially contaminated with explosive waste. HSAAP/BAE officials have stated that they are contaminated, but Tennessee Department of Environment and Conservation (TDEC) hazardous waste management officials claim that tests performed by HSAAP indicate that the materials are not contaminated by explosives and may be legally landfilled. TDEC officials state that HSAAP open burns the materials because they are potentially contaminated and they can therefore be open burned in non-RCRA units because RCRA does not apply."

"The third type of waste is large articles that are potentially contaminated with explosives and includes various materials, piping from buildings, process vessels, building demolition material including concrete, and possibly soil surrounding these areas. These materials are placed in large piles at the burning ground. They are burned without a RCRA permit. Again, it is unclear whether or not these materials are contaminated with explosive residue."

"Since many of the materials that are required to be thermally decontaminated are not combustible, large amounts of "clean" wood is used along with small quantities of kerosene or diesel to facilitate the burning of pile material."

"Over the past several years OSI and HSAAP have been working on removing

inoperable and decommissioned equipment and structures from the site. This has been a multi-year project and is continuing."

"The Holston Army Ammunition Plant is the major supplier of explosive materials – primarily RDX- and HMX-based products - to the U.S. Department of Defense, according to OSI. The EMCW (Energetic Material Contaminated Waste)generated is primarily composed of paper, plastic bags, pallets, boxes, liners, piping, and other items potentially contaminated with EM. In the past, EMCW disposal accounted for 92 percent all material disposed. Flashing has been conducted outside the open burning grounds in decontamination ovens or in one of the EMCW piles."

"According to "A Soldiers Handbook" Vol. I Explosives, " Unlike stereotypes, common myths and Hollywood nonsense, most high explosives are very stable and will not detonate even when subjected to violent actions such as fire, pressure, mild impacts, abrasions, cutting, friction and so forth. However, some high explosives are not so stable, and are called "primary explosives". The term primary explosive has nothing to do with explosive's power, and it strictly refers to explosives that are easily detonated. Secondary explosives make up the bulk of high explosives and are the most powerful. Secondary explosives include, but are not limited to RDX, HMX, AND TATB. RDX is a secondary nitramine explosive. The stability of secondary explosives is demonstrated in the following scenarios: Explosives such as TNT and RDX and others can be set on fire, thrown against walls, stepped on, mangled, and seriously abused without fear of detonation."

Thermal Treatment of Munitions-Contaminated Wastes as a Source of Toxic Air Releases

"Thermally treating explosives with "clean" wood set ablaze by kerosene or diesel fuel causes the release of dangerous, unmonitored air pollutants which subject citizens to unreasonable and unacceptable health risks, A few examples of these pollutants are briefly described below:"

Fine Particulate Matter (PM₁₀)

"Fine particulate matter are tiny dust and soot particles, smaller than L0 microns in diameter, that are small enough to be inhaled and trapped in the lungs and get into the bloodstream. Inhaled particles are a concern because of their potential to cause cancer and other respiratory conditions."

Carbon Monoxide (CO)

"Carbon monoxide is a colorless, odorless gas and a chemical asphyxiant: It binds to hemoglobin in the blood and prevents hemoglobin from transporting needed oxygen throughout the body, including the heart and brain. People with several types of heart disease already have reduced capacity for pumping ability to respond to oxygen demands, and exposure limits the activities they can safely perform."

Nitrogen Oxides (NO & NO₂)

"Nitric Oxide is a precursor to NO₂. Both gases are formed by incomplete combustion of fuels and contribute to "acid rain". NO and NO₂ can interfere with the body's ability to transport oxygen. A major effect of breathing increased levels of Nitrogen Dioxide (NO₂) is the increased likelihood of respiratory problems. Current scientific evidence links short term NO₂ exposures ranging from 30 minutes to 24 hours with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between

breathing elevated short term NO₂ concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma."

Sulfur Dioxide (SO₂)

"Short term exposure to (SO₂) can harm the human respiratory system and make breathing difficult. Children, the elderly, and those who suffer from asthma are particularly at risk from the effects of SO₂. When SO₃, binds with particulates it can become corrosive and potentially carcinogenic."

Air Pollutants in Diesel Fuel Used as an Accelerant

"Diesel accelerants and many of the individual substances contained in it (including arsenic, benzene, formaldehyde and nickel) have the potential to contribute to mutations in cells that can lead to cancer. In fact, long-term exposure to combusted diesel fuel particles poses the highest cancer risk of any toxic air contaminant evaluated by the California OEHHA (Office of Environmental Health Hazard Assessment). Additionally, exposure to combusted diesel fuel particles can have immediate health effects such as eye, nose, throat and lung irritation. Numerous studies have linked fine particle pollution caused by this activity to asthma attacks and premature deaths among those suffering from respiratory problems."

Other Hazardous Chemicals

"There are over 100 Hazardous Chemicals released from open burning construction demolition debris using "clean" wood that can be toxic and carcinogenic. For example, Benzene and Formaldehyde are two carcinogens that can be released from the toxic mixture that is created when potentially explosive contaminated demolition debris is open burned."

Cyanide

"During open burns, RDX produces a lot of cyanide as well as NOX molecules. Cyanide is very toxic and has been implicated as a cause of autism in children. (See Exhibits 4,5)"

Dioxins

"Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system and can interfere with hormones. Short-term exposure of humans to high levels of dioxins may result in skin lesions, such as chloracne, patchy darkening of the skin, and altered liver function. Long term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions. The developing fetus is most sensitive to dioxin exposure. Newborn, with rapidly developing organ systems, may also be more vulnerable to certain effects. Some people or groups of people may be exposed to higher levels of dioxins because of their diet, or their occupation/location (near pulp and paper plants, incineration plants and hazardous waste sites). Chronic exposure of animals to dioxins has resulted in several types of cancer. Potential sources of dioxins emissions include combustion of wood, plastics, PCBs and other building components. In some instances, "several tons of wood" are burned to treat a very small amount of waste at HSAAP, according to officials with the Tennessee Division of Air Pollution Control."

Polychlorinated Biphenyls

"Human exposure to PCBs is a concern because of the wide range of adverse health effects including skin irritation, reproductive and developmental effects, immunologic effects, liver damage, and cancer. The developing fetus, infants, and children are the population groups most vulnerable to exposure. Exposure may impede the development of their brains, reproductive, immune, and endocrine systems. Emissions from open air burning may be expected to cause an increase in respiratory symptoms for individuals with asthma or other sensitive populations such as children or the elderly."

"EPA has affirmed that dioxins (i.e., chlorinated dioxins and chlorinated furans) could be a byproduct from combustion of the PCBs found in buildings and demolition debris. In addition, polychlorinated dibenzofurans could also be formed and may be the predominant form."

"Because PCBs and dioxins are actually mixtures of semi-volatile organic compounds with congeners that have a range of volatilities, PCBs and dioxins emitted to air will distribute between the vapor phase and the particulate phase (by adsorption onto particles). The vapor phase PCBs and dioxins are subject to direct uptake by the leafy parts of grass and crops; and the particulate matter can deposit onto crops and soil. Also, vapor phase and particulate PCBs and dioxins can diffuse into water bodies, deposit directly onto water bodies, and enter waterbodies via soil erosion and runoff. Both PCBs and dioxins are persistent in the environment and do not readily degrade. PCBs can travel long distances in the air (>1-0 miles) and deposit in areas far from where they were released."

"In addition to direct exposure through inhalation, indirect pathways are possible and associated risks from these pathways could be higher. Examples of indirect pathways include uptake of PCBs and dioxins into edible crops and pasture grass, human consumption of edible crops, consumption of pasture grass by beef and dairy cattle and other livestock followed by human consumption of the livestock and milk, incidental soil ingestion and dermal contact with PCBs and dioxins in soil, uptake and bioaccumulation of PCBs by fish in waterbodies, and human consumption of fish."

Asbestos

"As noted above, concrete and building demolition materials are specifically identified as thermally treated wastes at Holston by the operating contractor. Asbestos was historically added to a variety of building materials and is found in concrete and concrete-like products. In addition to asbestos in the concrete itself, asbestos can be present in materials used to coat the asbestos such as paints and asphalt type coatings. Some caulks, used to seal seams or joints, contain asbestos."

"There can also be asbestos concrete pipes or transite siding (a fireproof composite material made of asbestos and cement), and cement ducts embedded in the concrete. Cement-like products used to patch or fill concrete and brick may contain asbestos. Literally hundreds of cement-based products used for insulation, masonry, stucco, finishing, roads, and other applications contain asbestos. In other words, even if the concrete does not contain asbestos that does not mean that there are not other asbestos containing products that may need to be addressed."

"Hubbellite is the brand name for a poured seamless floor that entered the market in the 1940s and is an example of applied flooring that may contain asbestos. Hubbellite is composed of a mixture of cement, limestone, copper and magnesium compounds, and proprietary additives. According to the manufacturer, Hubbellite flooring is fire resistant, chemical resistant (including solvents), non-sparking, and static-disseminating."

"In 1998, the EPA issued a memo alerting industry and labor organizations of the

potential for asbestos in "soft" concrete in the roofs of buildings. An inspection of a roof repair project on a government building revealed that the concrete material used for forming the roof surface in L934 contained a high concentration of asbestos. Analysis of the concrete revealed it had an asbestos content of between two and 10% by weight."

"Military Formulation of Super Powerhouse insulation cement (produced from 1957 to 1971) contained 5% chrysotile asbestos and was developed to conform to government specification. This product was manufactured and sold exclusively for U.S. government military installations. (The commercial formulation without asbestos continued in production.) Both products were dry, mixtures containing spun mineral-wool, hydraulic setting binders, clays and other ingredients. Its use in or on concrete is not known."

"Citizens of Kingsport, Tennessee are among those unfortunate enough to be located near toxic waste incinerators, a pulp and paper plant and several hazardous waste sites, including HSAAP. In the last year, HSAAP was investigated for open burning PCBs. The TDEC and EPA reports indicated that HSAAP had failed to test liquid and nonliquid potential sources of PCBs prior to open burning the materials. EPA also found that HSAAP had burned an unknown amount of PCBs and in a telephone conversation on November 17, 2015 advised HSAAP take certain actions to ensure that open burning of PCBs does not occur in the future. Despite this, during an inspection on December 10, 2015 TDEC determined that HSAAP was still failing to test used oil for PCBs as required by law. No enforcement action was taken. On July 3, 2012 HSAAP violated its air and hazardous waste permits by open burning 3346 pounds of triaminotrinitro-benzene (TATB) in a single day when the permit limit was 36 pounds per month. Hazardous reaction products of TATB include carbon dioxide, carbon monoxide and toxic oxides of nitrogen. Effects of human exposure to TATB through inhalation, ingestion or through skin and eyes include anemia, moderate cyanosis, fatigue, headache, dizziness, loss of weight and insomnia. Long term exposure can result in damage to the liver and kidneys. This permit violation, and the failure of HSAAP to promptly report it to TDEC resulted in the imposition of a substantial fine against HSAAP. These types of mishaps, along with the permitted open burning by HSAAP pose a significant short and long term health risk for all residents of neighborhoods within miles of the plant, (See Exhibit 15). These toxic exposures likely would not have occurred if TDEC had been more diligent in requiring HSAAP to identify and implement existing alternative technologies for the treatment and disposal of these explosive and potentially explosive-contaminated wastes."

"HSAAP has claimed on more than one occasion that no proven reasonable alternatives to open burning exist to treat the explosive waste located at the plant. We submit that HSAAP and the military in general are resistant to testing, or implementing alternatives to open burning explosive waste, and will only do so under pressure from Congress, EPA, TDEC and citizen's groups."

"Beginning in 2000, the Army began pressing for approval to open air burn more than 1,000 excess buildings at Wisconsin's Badger Army Ammunition Plant (Badger) - a proposal that even the military acknowledged was not environmentally friendly. Studies by the U.S. Army Industrial Operations Command at Sunflower Army Ammunition Plant in Kansas confirmed that open burning of explosive-contaminated structures produces toxic emissions including "nitrous oxide, carbon monoxide, asbestos, lead vapors, lead particulates, zinc, polyaromatic hydrocarbons, and dioxins". During the three years that EPA considered the Army's proposed open burning of PCB-contaminated buildings, Citizens for Safe Water Around Badger CSWAB organized a strong national campaign opposing open burning that garnered support from more than 160 organizations. They traveled to Washington to meet with federal legislators and EPA headquarters, to Chicago to meet EPA officials there, and

submitted dozens of Freedom of Information Act requests. Their members sent in more than L,400 postcards to the EPA, thousands of emails were sent to legislators, EPA officials, and the Wisconsin Department of Natural Resources (WDNR).

National and local media attention - radio, television, and print - raised the visibility of the issue and their campaign. In addition to considerable citizen activism, there was significant local Congressional involvement. Prominent among them were U.S. Senator Russ Feingold, U.S. Senator Herbert Kohl and then-Congresswoman Tammy Baldwin. Collectively, these actions prompted officials at Badger to explore non-thermal solutions and the Army successfully gained approval from the U.S. Department of Defense Explosives Safety Board for wet demolition of buildings that had been previously identified by the military as highly sensitive. Altogether, more than 1,300 explosives-contaminated buildings that were originally slated for open air burning were successfully decontaminated and demolished at Badger using this non-thermal alternative. (See Exhibit 6)"

"Similarly, in 2015, citizens of Minden, Louisiana banded together to stop the EPA from allowing the army to proceed with open burning of approximately 15 million pounds of M-6 propellant. In a letter dated January 22, 2015, Frances Kelley of Louisiana Progress Action, supported by approximately 6,000 citizens of Louisiana questioned the army's claim that open burning was the only safe, proven method of disposal of M-6 propellant and objected to EPA's exclusion of citizens from the decision-making process. (See Exhibit 7)"

"With the assistance of Chemistry Professor Brian Salvatore, toxicologist Robert Flournoy, local citizens and private companies that were experts in the destruction of energetics, they were able to stop the open burning plan. A contained burn system with advanced air pollution controls is being used instead, but only after private citizens and EPA regulators who disagreed with the open burn plan from the beginning brought a great deal of pressure to bear upon those bent on doing things the wrong way. (See Exhibit 8)"

"Other technologies, thermal and non-thermal, are available to treat all of the explosive waste and potentially explosive- contaminated materials currently being treated by open burning at HSAAP, and they should already be in use. Supercritical Water Oxidation, Gas Phase Chemical Reduction, Munirem, transportable or stationary flashing furnaces, contained burn systems like the one currently in use in Minden, Louisiana, contaminated waste processors and wet demolition are just a few of the alternatives which are currently in use or have been previously used at other military and non-military locations in the United States and around the world to treat explosive waste and potentially explosive contaminated waste. (See Exhibits 8-13)"

"We strongly advocate for the protection of human health and the environment by calling for the immediate implementation of safer alternatives to open air burning, detonation and non-closed loop incineration/combustion of military munitions. These alternatives must incentivize waste prevention and recycling; prevent, to the greatest possible extent, the release of toxic emissions and pollutants; and advance the principles of environmental justice by assuring all people enjoy the same degree of protection and access to the decision-making process."

"We therefore recommend the inclusion of the following language into the proposed Title V permits:"

"Open burning of explosive waste or potentially explosive contaminated materials of any nature is expressly prohibited if permittee knows, or after reasonable inquiry should have known that reasonable alternatives to open burning exist. Violation of this permit condition shall result in the imposition of civil and/or criminal penalties, as warranted, retroactively, for each calendar day of violation from the effective date of this permit. In determining what penalty shall be imposed, TDEC shall consult with REGION 4 EPA and shall take into consideration whether or not permittee has made a full disclosure of alternative treatment technologies,"

"Permittee shall immediately file a verified statement more particularly describing the explosive waste that has the fewest emissions referred to in the letter, the safe alternatives for disposing of this waste, and the date on which BAE/HAAP become aware of the alternatives. Failure to provide the statement shall result in an immediate suspension or termination of permittee's legal rights under this permit to engage in open burning of any type."

3. Open burning of materials suspected of containing Polychlorinated Biphenyls (PCBs)

"On March 25 2016, Jon D. Johnston, Chief, Materials and Waste Management Branch, Resource Conservation and Restoration Division, EPA Region 4, Atlanta Ga., sent a letter to R.E. Winstead, Environmental Manager of BAE/HSAAP which outlined a verbal agreement reached between EPA and BAE/HSAAP on November 17 2015 concerning open burning of potentially explosives contaminated demolition debris that may also contain regulated levels of PCBs (Exhibit14). To date, it is unknown to us whether or not BAE or HSAAP have signed a written, enforceable agreement. In part, the letter states "Because an unknown amount of PCBs has been burned at the burn pile area, as part of final closure the EPA expects that HSAAP will formally consult with TDEC and the EPA regarding the appropriate characterization of soil and groundwater for the products of incomplete combustion of PCBs."

We note that while HSAAP has advised EPA that it landfills any materials suspected of containing asbestos, we note that the Draft permit does not contain specific language about asbestos."

We therefore recommend the inclusion of the following language into the proposed Title V permits:

- A. "Permittee is prohibited from open burning any materials that may contain PCBs or asbestos."
- B. "Suspect items that cannot be safely transported for landfill disposal, due to the presence of significant explosive residue, will be characterized and if PCBs or asbestos are found, alternate decontamination methods will be employed, followed by landfill disposal. In the event that alternate methods to burning are not feasible or successful, Permittee will consult with EPA on the proper disposal of the debris."
- C. "If and when a Phase 4 demolition program is implemented, Permittee shall confer with EPA prior to implementation to ensure compliance with the PCB, asbestos and RCRA regulations."
- D. "Any waste oil or any other type of oil potentially contaminated with explosive residue will be tested for PCBs prior to disposal."
- E. "As part of final closure Permittee shall formally consult with TDEC and EPA regarding the appropriate characterization of soil and ground water for the products of incomplete combustion of PCBs.

A "copy of the document submitted by Judge Toohey is attached to this Summary of Comments document (see Attachment 2)."

Response:

The general themes section addresses this concern and part of Judge Toohey's recommendations are included in the proposed draft permit.

Commenter: Robert Q. Parker

Mr. Parker's detailed comments received by the Division on August 29, 2017, are as follows:

Comment(s):

"I attended the public hearing here in Kingsport, Tennessee on August 18, 2016 and offered a very short statement and indicated that I would submit written statement prior to the deadline on August 29, 2016. A stated in my remarks at that time, I am a private citizen residing here in Kingsport."

"As you may recall I did ask whether the permit application being applied for takes into consideration the new amounts of toxics predicted to be destroyed over the next permit period. I will await the response to that inquiry when that information becomes available."

Response:

There are no limits of open burning of explosives and explosive-contaminated and or potentially explosive contaminated materials. However, the facility is required to only operate (actively start fires) during the hours between 8:30 AM and 7:30 PM daily and open burning shall not be conducted in excess of 400 hours per year.

Comment(s):

"In the interest of time I am submitting several exhibits that cover this topic quite thoroughly and thorough."

"A letter to Mr. Ken Feely, Regional PCB Coordination/Cleanups, from R. E. Winstead, Environmental Manager for BAE Systems. In this correspondence Mr. Winstead states that there is no other way to deal with this toxic material."

"However in Exhibit 13 we see that Dr. Thomas M. Connelly, Jr. Executive Director and CEO of the American Chemical Society states that there are indeed other more safe ways to deal with this matter."

"Exhibit 10 is from Blue Grass Chemical Stockpile Outreach Office. In this information you will find that they do have the ability to destroy toxic material in a safe and efficient manner. I suggest strongly that you contact them to determine why this method could not be implemented at the Holston Army Ammunition Plant in Kingsport, Tennessee."

"Please also read Exhibit 12 from El Dorado Engineering Inc. concerning their Transportable Flashing Furnace."

"From my vantage point it appears that there are safe ways to dispose of the toxic waste other than by burning. I await your response.'

A copy of the document submitted by Mr. Parker is attached to this Summary of Comments document (see Attachment3).

Response:

The general themes section addresses this concern.

Commenter:	Jenna Toohey
Comment(s):	From my understanding, there are alternative to open burning, however BAE does not do its best to use these alternatives. Renewing permits is easier for them. This is unacceptable.
	A copy of the letter submitted by Ms. Jenna Toohey is attached to this Summary of Comments document (see Attachment 4).
Response:	The general themes section addresses this concern.
Commenter:	Laura Olah National Coordinator, CEASE FIRE Campaign Executive Director, Citizens for Safe Water Around Badger (CSWAB)

Comment(s):

By this letter, the Cease Fire Campaign objects to the continued open air burning and detonation of explosives and related munitions wastes at the Holston Army Ammunition Plant based on the availability of safer advanced alternatives, the excessive risk to human health and the environment, and noncompliance with federal law requiring the implementation of available safer advanced treatment methods.

By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Military personnel are often the most exposed to these toxic pollutants, along with nearby communities. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants.

In the past 25 years, alternatives to the incineration of hazardous waste have emerged due to the work of communities, EPA, and the Department of Defense (DOD). These technologies are being used by the DOD to destroy energetics and chemical warfare agents and could be readily applied to conventional munitions and other types of hazardous waste.

Examples of these technologies include Gas Phase Chemical Reduction which uses hydrogen and heat to break down toxic chemicals into their basic components. Because hydrogen is used for the reduction reaction and no oxygen is present, no harmful chlorinated byproducts can be formed. This technology was used to destroy PCBs and obsolete pesticides in Australia. It was specifically developed for the Assembled Chemicals Weapons Destruction program.

Supercritical Water Oxidation uses the unique forces of supercritical fluids to breakdown the chemical bonds which form munitions, propellants, and energetics. Supercritical Water Oxidation uses super pressurized, heated water to tear apart the chemical bonds in toxic organic compounds, breaking them down into basic components such as water, carbon dioxide, and nitrogen gas. The lower temperature (compared to combustion) and the high pressure of the water keep harmful byproducts from being formed.

There are several types of detonation chambers that can be used to safely destroy waste munitions. These detonation chambers are much safer than open burning or incineration because they hold and test the gases to ensure all the toxic components have been destroyed before releasing them. One kind of detonation chamber, the DAVINCH

chamber, detonates explosives in a vacuum. Without the presence of oxygen, harmful products of incomplete combustion cannot be formed.

Moreover, over the past 15 years the Department of Defense Explosives Safety Board has certified a number of technologies as safe for the destruction of hazardous wastes which are explosive. Those technologies are now in use by the Department of Defense and the private sector for the destruction of explosive hazardous waste.

Not only do safer advanced technologies exist, their implementation is required by federal law. The operating language on open burning/open detonation of hazardous wastes which are waste explosives is contained in Title 40, Section 266.382. "Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment." (Emphasis added.)

The CEASE FIRE Campaign is a national coalition of more than 50 environmental, labor, veterans service and social justice organizations. Our campaign seeks to protect human health and the environment by calling for the immediate implementation of safer alternatives to open air burning, detonation and non-closed loop incineration/combustion of military munitions. These alternatives must incentivize waste prevention and recycling; prevent, to the greatest possible extent, the release of toxic emissions and pollutants; and advance the principles of environmental justice by assuring that all people enjoy the same degree of protection and access to the decision-making process.

A copy of the letter submitted by Ms. Laura Olah is attached to this Summary of Comments document (see Attachment 5).

Response:

The general themes section addresses this concern.

Commenters:	John A. Evans, Robbie C. Lewis, Carol Stout, Matthew Spivey, Zach Boggan, Allison Toohey, Jill Cookenour, Jenna Toohey, John S. McLellan, III, Jason Blevins, Teresa Booker, Cassidy Shaver, Karla Hammands, Melinda Lashley, Andrea Harrell, Emily Hutchins, B. Church, C. Rainehy
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The following comment submitted by above mentioned commenters is similar and addressed in the combined response below.

Comment(s):

Please be advised that I am opposed to the renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. Open burning and detonation result in the uncontrolled release of toxic pollutants to our environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Our community has felt the adverse effects of these toxic pollutants for years. Please protect our health by requiring the Army to use other available alternatives to open burning in our community of Kingsport, TN. Thank you for your time and consideration.

A copy of each letter submitted by the individuals via email is attached to this Summary of Comments document (see Attachment 6).

Response:

The general themes section addresses this concern.

Commenters:

Joshua R. Winkler, Renee, Jenna Toohey, Jason Belvins, James C. Campbell, Liz Hoyle, SM Banbury, Dany, Rorlowske, Cindy Whitt, Wauhatchie, Cailin Craig, Mark Toohey, Connie Suzanne, Chris, Random, Mh Whetsell, Jms Wagerty, Gla, Bobb, Choochiepie, Kay Kay, Mike and MDonwder, Sparrowhawks, Lesley Ockoa, Bkornich, Zcastillo, Dreambbw, Pickjames, Sanford Smith, Annies address, Js Outher, Janice, Oliviela, Eanes, Sandy, Kirk, Thomas, M Brant, Jd Sams, Clare Collins, J Pierce, Lindsay Meghan Kopp, Southern Bell, Calol Ott, Bob Boland, Paul Morris, Bonnie Camp, Lenorerr, Paul B. Van Geel, Einz, Sharoon Cookies, Linde Brocato, John Selser, Jamercer, J Henderson, Darktower, Debi Darnell, Paromovn, Papa Smurff, Mark Armetz, Kathleen, Jacki Masar, J. H. Hamilton, Cf Wedding, Michael and Marie, Black Rose, Tina M. Tine, Bier, Dish Man, Jim Steitz, Ameli Harris Cm Dare, MT Flower, Dustin Jackson, Cris Bartolomoe, Kerm East, Rob Bearls, Angela Padgett, Jt Stewart, Cathy Nelson Davis, A Miller, J. Mattes, Jim Green, Jenny Midyett, E. M. Howard, Lindsay Hanley Susie Bobbe, Jr Thoman, Kimberly Potts, Jim and Sam, David B., M. Hagee, Robert Dale Sweeney, Liz Hoyle.

The following comment submitted by the above mentioned commenters via email is similar and addressed in the combined response below.

Comment(s):

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

A copy of each letter submitted by the individuals via email is attached to this Summary of Comments document (see Attachment 7).

Response:

The general themes section addresses this concern.

Attachment 1

Tel: (865) 522-7007 Fax: (865) 525-4988 TENNESSEE CLEAN WATER NETWORK

PO Box 1521 Knoxville, TN 37901

625 Market St, 8th Floor Knoxville, TN 37902

www.tcwn.org

June 13, 2016

Ms. Michelle Walker Owenby, Director Division of Air Pollution Control Tennessee Department of Environment & Conservation William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, Tennessee 37243

Subject: Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby,

The Tennessee Clean Water Network (TCWN) is submitting the following comments in response to the public notice regarding the proposed operating permit renewals for the Holston Army Ammunition Plant (568191 & 568188).

As you know polychlorinated biphenyls (PCBs) are extremely toxic, persistent, and bioaccumulative industrial pollutants. Proper regulation of PCBs is essential to protecting air and water quality as well as human health. Since open burning is solely regulated by the state¹ we strongly encourage TDEC to protect human health and the environment by calling for the immediate implementation of safer alternatives to open air burning, detonation and non-closed loop incineration/combustion of military munitions. These alternatives must incentivize waste prevention and recycling; prevent, to the greatest possible extent, the release of toxic emissions and pollutants; and advance the principles of environmental justice by assuring all people enjoy the same degree of protection and access to the decision-making process.

Should the state instead finalize these permits we request they include the agreements referenced in the US EPA's letter to HAAP dated March 25, 2016. According to this correspondence, these stipulations have already been agreed upon and therefore will not be contentious additional components in the two permits.

¹ T.C.A. §§68-25-105 and 4-5-202

HAAP will permanently cease the open burning of demolition debris or any other material suspected of containing PCBs.

TCWN requests both permits strictly prohibit the burning of any materials that may contain PCBs. EPA's letter specified demolition debris (including pumps, motors, painted piping, painted masonry or wood, caulking), but the permits should clearly state any materials suspected of containing PCBs are ineligible for open burning.

2. HAAP will evaluate alternate decontamination methods for materials characterized by PCBs.

The permits should note HAAP must evaluate alternate decontamination methods for those material considered to contain PCBs prior to disposal in the landfill. Should HAAP not find an alternative method, EPA will be consulted.

3. HAAP will eliminate PCB characterized material from existing burn pile.

HAAP agreed to deconstruct and sort through the existing burn pile for PCB suspected items. If this has not already been completed, it should be required in these permits. The permits should specify that analytical testing will determine the proper disposal technique of any materials found to contain PCBs.

4. Potentially contaminated oil will be tested.

The permits should require any oils potentially contaminated with explosive residue to be tested for PCBs before burning. If found to contain PCBs these oils will be disposed via an alternative method.

5. A public hearing is warranted.

TCWN would like to request a public hearing for these permits. It is our understanding the public has been very concerned about open burning, and TCWN believes a public hearing is warranted for the presentation of information to the public as well as granting the public the opportunity to voice their concerns.

We appreciate the opportunity to comment on this draft permit and the Division's consideration of these concerns. Please send a copy of the final permit to me at dana@tcwn.org.

Sincerely,

Dana Wright

Water Policy Director

Dana S. Wright

1. HAAP will permanently cease the open burning of demolition debris or any other material suspected of containing PCBs.

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The permits should note HAAP must evaluate alternate decontamination methods for those material considered to contain PCBs prior to disposal in the landfill. Should HAAP not find an alternative method, EPA will be consulted.

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We appreciate the opportunity to comment on this draft permit and the Division's consideration of these concerns. Please send a copy of the final permit to me at dana@tcwn.org.

Sincerely,

Dana Wright

Water Policy Director

Dana L. Wright

Attachment 2

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

August 17, 2016

AUG 22 2016 PM12:03

82-0018 37-0018

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby:

Enclosed herewith please find our comments regarding the above referenced Draft Permits, including 15 Exhibits for inclusion into the public record in this matter. We will hand deliver this hardcopy at the public hearing scheduled for August 18, 2016 and we will email copies to you and others as well. Thank you for your time and attention to this matter.

Coman Joshy

Sincerely,

Mark and Connie Toohey 2529 Rivermont Circle

Kingsport, Tn. 37660

Telephone: (423)-765-3947

Comments on Title V Draft Renewal Permits 568191 & 568188 for Holston Army Ammunition Plant (HSAAP)

1. Duty to Fully Disclose Alternative Treatment Technologies

In accordance with TAPCR 1200-3-4-.04(1)(h), an exception to open burning may be approved where "there is no other practical, safe, and/or lawful method of disposal. Documentation demonstrating why the general open burning regulations cannot be met must be submitted." TAPCR 1200-3-4-.04(1)(k) states that "Open burning conducted under this exception is only allowed where no other safe means of disposal exists." Furthermore, TAPCR 1200-3-4-.04 (2) states "The Technical Secretary reserves the right to require a person to cease or limit open burning if emissions from the fires are deemed by the Technical Secretary or his designee to jeopardize public health or welfare, create a public nuisance or safety hazard, create a potential safety hazard, or interfere with the attainment or maintenance of the air quality standards."

HSAAP's current Title V permit states:

"A6. Submittal of Requested Information The Permittee shall furnish to the Technical Secretary, within a reasonable time, any information that the Technical Secretary shall request in writing to determine whether cause exists for modifying, revoking and reissuing, or termination of the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Technical Secretary copies of records required to be kept by the permit. If permittee claims that such information is confidential, the Technical Secretary may review that claim and hold the information in protected status until such time that the Board can hear any contested proceedings regarding confidentiality disputes. If the information is desired by EPA, the permittee may mail the information directly to EPA. Any claims of confidentiality for federal purposes will be determined by EPA.

TAPCR 1200-3-9-.02(11)(e)1(vi)(V)."

On July 13,2012, R.E. Winstead, Environmental Manager of BAE/HSAAP authored a letter, with the approval of HSAAP staff which purported to fully respond to an inquiry made by Tennessee Department of Environment and Conservation (TDEC) concerning reasonable alternatives to open burning explosive waste at HSAAP. (See Exhibit 1) In the letter, Mr. Winstead stated "The explosives waste that has the fewest emissions appears to have other safe alternatives to open burning." Although the letter appeared to be referring to the hazardous waste open burned in the RCRA burn pan unit, the letter does not make specific reference to that unit. The letter also failed to identify the alternatives available for that type of explosive waste. Mr. Winstead also stated that overall a total of 5 commercially available technologies were evaluated, but he failed to identify the technologies he was referring to. Instead, he referenced a March 2012 report, ERDC/EL TR-

12-8 entitled "Alternative Treatment Options for Open Burning of Explosive Waste at Holston Army Ammunition Plant". Since then, despite repeated requests to make the report available to TDEC, EPA, and others, the army has failed to produce the document, claiming that it is proprietary information which is only authorized for distribution to U.S. Government agencies (See Exhibit 2). The army's classification of this document is: UNCLASSIFIED.

Given the fact that HSAAP admits that there "appears to be other safe alternatives to open burning" for at least one of the explosive waste streams located at HSAAP, it appears that both federal and state laws prohibit the use of open burning to treat that waste. To the extent that military personnel are ordered to engage in open burning of this waste, it places them in the position of either disobeying a direct order or potentially violating the law. It is therefore prudent and legal for the Tennessee Department of Environment and Conservation to refuse to permit the continued open burning of the explosive waste referred to in Mr. Winstead's letter, and to refuse to allow any open burning to take place unless and until HSAAP complies with its obligations under its current permit to submit the requested report and any additional information required by TDEC or EPA. We request that the Tennessee Board of Air Pollution Control and the EPA make a formal determination as to the validity of the army's claim that the report contains confidential proprietary information which renders it unavailable to the public.

2. Duty to Use Alternative Treatment Technologies

In accordance with TAPCR 1200-3-4-.04(1)(h) (Tennessee law), an exception to open burning may be approved where "there is no other practical, safe, and/or lawful method of disposal. Documentation demonstrating why the general open burning regulations cannot be met must be submitted." TAPCR 1200-3-4-.04(1)(k) also states that "Open burning conducted under this exception is only allowed where no other safe means of disposal exists."

Likewise, under 40 CFR §265.382, (Federal Law), "Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment..."

Holston Army Ammunition Plant and Kingsport, Tn.

The open burning area for waste explosives and explosives-contaminated material and potentially explosives-contaminated material at Holston Army Ammunition Plant is located approximately 0.85 miles from the closest facility boundary and approximately 1.5 miles from the closest resident, according to BAE Systems Ordnance Systems Inc. (OSI) — the operating contractor for Holston Army Ammunition Plant. The base is located at the confluence of the North and South Forks of the Holston River at Kingsport, Tennessee. Roughly 1,672 people live within one mile of the facility. (See Exhibit 15). Statistically, it can

be inferred that approximately 100-134 of these residents suffer from asthma. Domtar Paper Company and Eastman Chemical Company are located roughly 3 and 5 miles, respectively from Holston Army Ammunition Plant. These industries emit a host of air pollutants which travel into the communities located near the open burning site. A portion of the area surrounding Eastman Chemical Company is out of compliance for Sulphur dioxide emissions. According to a 2009 USA Today report, which used EPA data submitted by industry, air modeling and ambient air testing, Kingsport City Schools are subjected to more toxic air pollution than 98-99% of 127,809 schools studied throughout the United States. For example, only 41 out of 127,809 schools across the U.S. had worse air pollution than Johnson Elementary School. Jackson Elementary School, which is roughly 3 miles from Holston Army Ammunition Plant was ranked in the top 1% of the worst schools in the nation for air pollution. According to the report, the 3 industries primarily responsible for the air pollution are Eastman Chemical Company, Weyerhauser (now Domtar) and Holston Army Ammunition Plant. (See Exhibit 3)

Concepts of environmental justice require TDEC and EPA to consider relevant public health and industry data concerning the potential for multiple exposures or *cumulative* exposure to human health or environmental hazards in our affected population as well as historical exposure to environmental hazards. *Cumulative impact* is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (See 40 CFR 1508.7). We submit that the air pollution from these three industries creates significant short-term and long-term cumulative impacts on the air quality of the neighborhoods surrounding HSAAP. Continuing to allow the addition of unmonitored hazardous air pollutants into the atmosphere through open air burning at HSAAP threatens our short and long term health and well-being, as well as continuing what is readily identifiable as a public nuisance.

In December 2011, after a complaint from an area resident, officials with the Tennessee Division of Air Pollution Control reported observing ground level smoke from HSAAP lingering in the general area, impacting local air quality. On multiple occasions and as recently as June, 2016 community members have reported and photographed ground level smoke in neighboring residential areas that coincides with open burning at HSAAP. These observations indicate that residents are at risk for exposure to emissions from open air burning. It is also reasonable to expect that populations in closer proximity to the various source areas at HSAAP, such as onsite workers and other personnel, are at increased risk for exposure to the uncontrolled release of pollutants from open air burning and thermal treatment activities.

There are three main types of wastes that are burned at Holston, according to OSI. The first is bulk raw explosives that have become contaminated through contact with the manufacturing floor or out-of-spec product unsuitable for use or reprocessing. This waste

is burned normally each week in open burn pans pursuant to a Resource Conservation and Recovery Act (RCRA) hazardous waste permit.

The second type of waste consists of explosives-contaminated small articles such as plastic bags, paper towels, filters, personal protective equipment, and dewatering filter socks. This material is placed in a steel cage and is generally burned once a week even though it is permitted daily. This waste is burned in non-RCRA units pursuant to a Title V Permit only. It is unclear whether these items are contaminated or only *potentially* contaminated with explosive waste. HSAAP/BAE officials have stated that they are contaminated, but Tennessee Department of Environment and Conservation (TDEC) hazardous waste management officials claim that tests performed by HSAAP indicate that the materials are not contaminated by explosives and may be legally landfilled. TDEC officials state that HSAAP open burns the materials because they are *potentially* contaminated and they can therefore be open burned in non-RCRA units because RCRA does not apply.

The third type of waste is large articles that are potentially contaminated with explosives and includes various materials, piping from buildings, process vessels, building demolition material including concrete, and possibly soil surrounding these areas. These materials are placed in large piles at the burning ground. They are burned without a RCRA permit. Again, it is unclear whether or not these materials are contaminated with explosive residue.

Since many of the materials that are required to be thermally decontaminated are not combustible, large amounts of "clean" wood is used along with small quantities of kerosene or diesel to facilitate the burning of pile material.

Over the past several years OSI and HSAAP have been working on removing inoperable and decommissioned equipment and structures from the site. This has been a multi-year project and is continuing.

The Holston Army Ammunition Plant is the major supplier of explosive materials – primarily RDX- and HMX-based products – to the U.S. Department of Defense, according to OSI. The EMCW (Energetic Material Contaminated Waste) generated is primarily composed of paper, plastic bags, pallets, boxes, liners, piping, and other items potentially contaminated with EM. In the past, EMCW disposal accounted for 92 percent all material disposed. Flashing has been conducted outside the open burning grounds in decontamination ovens or in one of the EMCW piles.

According to "A Soldiers Handbook" Vol. I Explosives, "Unlike stereotypes, common myths and Hollywood nonsense, most high explosives are very stable and will not detonate even when subjected to violent actions such as fire, pressure, mild impacts, abrasions, cutting, friction and so forth. However, some high explosives are not so stable, and are called "primary explosives". The term primary explosive has nothing to do with explosive's power, and it strictly refers to explosives that are easily detonated. Secondary explosives make up the bulk of high explosives and are the most powerful. Secondary explosives include, but

are not limited to RDX, HMX, AND TATB. RDX is a secondary nitramine explosive. The stability of secondary explosives is demonstrated in the following scenarios: Explosives such as TNT and RDX and others can be set on fire, thrown against walls, stepped on, mangled, and seriously abused without fear of detonation.

Thermal Treatment of Munitions-Contaminated Wastes as a Source of Toxic Air Releases

Thermally treating explosives with "clean" wood set ablaze by kerosene or diesel fuel causes the release of dangerous, unmonitored air pollutants which subject citizens to unreasonable and unacceptable health risks. A few examples of these pollutants are briefly described below:

Fine Particulate Matter (PM₁₀)

Fine particulate matter are tiny dust and soot particles, smaller than 10 microns in diameter, that are small enough to be inhaled and trapped in the lungs and get into the bloodstream. Inhaled particles are a concern because of their potential to cause cancer and other respiratory conditions.

Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless gas and a chemical asphyxiant: It binds to hemoglobin in the blood and prevents hemoglobin from transporting needed oxygen throughout the body, including the heart and brain. People with several types of heart disease already have reduced capacity for pumping ability to respond to oxygen demands, and exposure limits the activities they can safely perform.

Nitrogen Oxides (NO & NO₂)

Nitric Oxide is a precursor to NO₂. Both gases are formed by incomplete combustion of fuels and contribute to "acid rain". NO and NO₂ can interfere with the body's ability to transport oxygen. A major effect of breathing increased levels of Nitrogen Dioxide (NO₂) is the increased likelihood of respiratory problems. Current scientific evidence links short-term NO₂ exposures ranging from 30 minutes to 24 hours with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between breathing elevated short-term NO₂ concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma.

Sulfur Dioxide (SO₂)

Short term exposure to (SO_2) can harm the human respiratory system and make breathing difficult. Children, the elderly, and those who suffer from asthma are particularly at risk from the effects of SO_2 . When SO_2 binds with particulates it can become corrosive and potentially carcinogenic.

Air Pollutants in Diesel Fuel Used as an Accelerant

Diesel accelerants and many of the individual substances contained in it (including arsenic, benzene, formaldehyde and nickel) have the potential to contribute to mutations in cells that can lead to cancer. In fact, long-term exposure to combusted diesel fuel particles poses the highest cancer risk of any toxic air contaminant evaluated by the California OEHHA (Office of Environmental Health Hazard Assessment). Additionally, exposure to combusted diesel fuel particles can have immediate health effects such as eye, nose, throat and lung irritation. Numerous studies have linked fine particle pollution caused by this activity to asthma attacks and premature deaths among those suffering from respiratory problems.

Other Hazardous Chemicals

There are over 100 Hazardous Chemicals released from open burning construction demolition debris using "clean" wood that can be toxic and carcinogenic. For example, Benzene and Formaldehyde are two carcinogens that can be released from the toxic mixture that is created when potentially explosive contaminated demolition debris is open burned.

Cvanide

During open burns, RDX produces a lot of cyanide as well as NOX molecules. Cyanide is very toxic and has been implicated as a cause of autism in children. (See Exhibits 4.5)

Dioxins

Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system and can interfere with hormones. Short-term exposure of humans to high levels of dioxins may result in skin lesions, such as chloracne, patchy darkening of the skin, and altered liver function. Long term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions. The developing fetus is most sensitive to dioxin exposure. Newborn, with rapidly developing organ systems, may also be more vulnerable to certain effects. Some people or groups of people may be exposed to higher levels of dioxins because of their diet, or their occupation/location (near pulp and paper plants, incineration plants and hazardous waste sites). Chronic exposure of animals to dioxins has resulted in several types of cancer. Potential sources of dioxins emissions include combustion of wood, plastics, PCBs and other building components. In some instances, "several tons of wood"

are burned to treat a very small amount of waste at HSAAP, according to officials with the Tennessee Division of Air Pollution Control.

Polychlorinated Biphenyls

Human exposure to PCBs is a concern because of the wide range of adverse health effects including skin irritation, reproductive and developmental effects, immunologic effects, liver damage, and cancer. The developing fetus, infants, and children are the population groups most vulnerable to exposure. Exposure may impede the development of their brains, reproductive, immune, and endocrine systems. Emissions from open air burning may be expected to cause an increase in respiratory symptoms for individuals with asthma or other sensitive populations such as children or the elderly.

EPA has affirmed that dioxins (i.e., chlorinated dioxins and chlorinated furans) could be a byproduct from combustion of the PCBs found in buildings and demolition debris. In addition, polychlorinated dibenzofurans could also be formed and may be the predominant form.

Because PCBs and dioxins are actually mixtures of semi-volatile organic compounds with congeners that have a range of volatilities, PCBs and dioxins emitted to air will distribute between the vapor phase and the particulate phase (by adsorption onto particles). The vapor phase PCBs and dioxins are subject to direct uptake by the leafy parts of grass and crops; and the particulate matter can deposit onto crops and soil.

Also, vapor phase and particulate PCBs and dioxins can diffuse into water bodies, deposit directly onto water bodies, and enter waterbodies via soil erosion and runoff. Both PCBs and dioxins are persistent in the environment and do not readily degrade. PCBs can travel long distances in the air (>10 miles) and deposit in areas far from where they were released.

In addition to direct exposure through inhalation, indirect pathways are possible and associated risks from these pathways could be higher. Examples of indirect pathways include uptake of PCBs and dioxins into edible crops and pasture grass, human consumption of edible crops, consumption of pasture grass by beef and dairy cattle and other livestock followed by human consumption of the livestock and milk, incidental soil ingestion and dermal contact with PCBs and dioxins in soil, uptake and bioaccumulation of PCBs by fish in waterbodies, and human consumption of fish.

Asbestos

As noted above, concrete and building demolition materials are specifically identified as thermally treated wastes at Holston by the operating contractor. Asbestos was historically added to a variety of building materials and is found in concrete and concrete-like

products. In addition to asbestos in the concrete itself, asbestos can be present in materials used to coat the asbestos such as paints and asphalt type coatings. Some caulks, used to seal seams or joints, contain asbestos.

There can also be asbestos concrete pipes or transite siding (a fireproof composite material made of asbestos and cement), and cement ducts embedded in the concrete. Cement-like products used to patch or fill concrete and brick may contain asbestos. Literally hundreds of cement-based products used for insulation, masonry, stucco, finishing, roads, and other applications contain asbestos. In other words, even if the concrete does not contain asbestos that does not mean that there are not other asbestos containing products that may need to be addressed.

Hubbellite is the brand name for a poured seamless floor that entered the market in the 1940s and is an example of applied flooring that may contain asbestos. Hubbellite is composed of a mixture of cement, limestone, copper and magnesium compounds, and proprietary additives. According to the manufacturer, Hubbellite flooring is fire resistant, chemical resistant (including solvents), non-sparking, and static-disseminating. In 1998, the EPA issued a memo alerting industry and labor organizations of the potential for asbestos in "soft" concrete in the roofs of buildings. An inspection of a roof repair project on a government building revealed that the concrete material used for forming the roof surface in 1934 contained a high concentration of asbestos. Analysis of the concrete revealed it had an asbestos content of between two and 10% by weight. Military Formulation of Super Powerhouse insulation cement (produced from 1957 to 1971) contained 5% chrysotile asbestos and was developed to conform to government specification. This product was manufactured and sold exclusively for U.S. government military installations. (The commercial formulation without asbestos continued in production.) Both products were dry, mixtures containing spun mineral-wool, hydraulic setting binders, clays and other ingredients. Its use in or on concrete is not known.

Citizens of Kingsport, Tennessee are among those unfortunate enough to be located near toxic waste incinerators, a pulp and paper plant and several hazardous waste sites, including HSAAP. In the last year, HSAAP was investigated for open burning PCBs. The TDEC and EPA reports indicated that HSAAP had failed to test liquid and non-liquid potential sources of PCBs prior to open burning the materials. EPA also found that HSAAP had burned an unknown amount of PCBs and in a telephone conversation on November 17, 2015 advised HSAAP take certain actions to ensure that open burning of PCBs does not occur in the future. Despite this, during an inspection on December 10, 2015 TDEC determined that HSAAP was still failing to test used oil for PCBs as required by law. No enforcement action was taken. On July 3, 2012 HSAAP violated its air and hazardous waste permits by open burning 3346 pounds of triamino-trinitro-benzene (TATB) in a single day when the permit limit was 36 pounds per month. Hazardous reaction products of TATB include carbon dioxide, carbon monoxide and toxic oxides of nitrogen. Effects of human exposure to TATB through inhalation, ingestion or through skin and eyes include anemia, moderate cyanosis, fatigue, headache, dizziness, loss of weight and insomnia. Long term exposure can result in damage to the liver and kidneys. This permit violation, and the

failure of HSAAP to promptly report it to TDEC resulted in the imposition of a substantial fine against HSAAP. These types of mishaps, along with the permitted open burning by HSAAP pose a significant short and long term health risk for all residents of neighborhoods within miles of the plant. (See Exhibit 15). These toxic exposures likely would not have occurred if TDEC had been more diligent in requiring HSAAP to identify and implement existing alternative technologies for the treatment and disposal of these explosive and potentially explosive-contaminated wastes.

HSAAP has claimed on more than one occasion that no *proven* reasonable alternatives to open burning exist to treat the explosive waste located at the plant. We submit that HSAAP and the military in general are resistant to testing, or implementing alternatives to open burning explosive waste, and will only do so under pressure from Congress, EPA, TDEC and citizen's groups.

Beginning in 2000, the Army began pressing for approval to open air burn more than 1,000 excess buildings at Wisconsin's Badger Army Ammunition Plant (Badger) - a proposal that even the military acknowledged was not environmentally friendly. Studies by the U.S. Army Industrial Operations Command at Sunflower Army Ammunition Plant in Kansas confirmed that open burning of explosive-contaminated structures produces toxic emissions including "nitrous oxide, carbon monoxide, asbestos, lead vapors, lead particulates, zinc, polyaromatic hydrocarbons, and dioxins". During the three years that EPA considered the Army's proposed open burning of PCB-contaminated buildings, Citizens for Safe Water Around Badger CSWAB organized a strong national campaign opposing open burning that garnered support from more than 160 organizations. They traveled to Washington to meet with federal legislators and EPA headquarters, to Chicago to meet EPA officials there, and submitted dozens of Freedom of Information Act requests. Their members sent in more than 1,400 postcards to the EPA, thousands of emails were sent to legislators, EPA officials, and the Wisconsin Department of Natural Resources (WDNR). National and local media attention - radio, television, and print - raised the visibility of the issue and their campaign. In addition to considerable citizen activism, there was significant local Congressional involvement. Prominent among them were U.S. Senator Russ Feingold, U.S. Senator Herbert Kohl and then-Congresswoman Tammy Baldwin. Collectively, these actions prompted officials at Badger to explore non-thermal solutions and the Army successfully gained approval from the U.S. Department of Defense Explosives Safety Board for wet demolition of buildings that had been previously identified by the military as highly sensitive. Altogether, more than 1,300 explosives-contaminated buildings that were originally slated for open air burning were successfully decontaminated and demolished at Badger using this non-thermal alternative. (See Exhibit 6)

Similarly, in 2015, citizens of Minden, Louisiana banded together to stop the EPA from allowing the army to proceed with open burning of approximately 15 million pounds of M-6 propellant. In a letter dated January 22, 2015, Frances Kelley of Louisiana Progress Action, supported by approximately 6,000 citizens of Louisiana questioned the army's claim that open burning was the only safe, proven method of disposal of M-6 propellant and objected to EPA's exclusion of citizens from the decision-making process. (See Exhibit7)

With the assistance of Chemistry Professor Brian Salvatore, toxicologist Robert Flournoy, local citizens and private companies that were experts in the destruction of energetics, they were able to stop the open burning plan. A contained burn system with advanced air pollution controls is being used instead, but only after private citizens and EPA regulators who disagreed with the open burn plan from the beginning brought a great deal of pressure to bear upon those bent on doing things the wrong way. (See Exhibit8)

Other technologies, thermal and non-thermal, are available to treat all of the explosive waste and potentially explosive- contaminated materials currently being treated by open burning at HSAAP, and they should already be in use. Supercritical Water Oxidation, Gas Phase Chemical Reduction, Munirem, transportable or stationary flashing furnaces, contained burn systems like the one currently in use in Minden, Louisiana, contaminated waste processors and wet demolition are just a few of the alternatives which are currently in use or have been previously used at other military and non-military locations in the United States and around the world to treat explosive waste and potentially explosive-contaminated waste. (See Exhibits 8-13)

We strongly advocate for the protection of human health and the environment by calling for the immediate implementation of safer alternatives to open air burning, detonation and non-closed loop incineration/combustion of military munitions. These alternatives must incentivize waste prevention and recycling; prevent, to the greatest possible extent, the release of toxic emissions and pollutants; and advance the principles of environmental justice by assuring all people enjoy the same degree of protection and access to the decision-making process.

We therefore recommend the inclusion of the following language into the proposed Title V permits:

"Open burning of explosive waste or potentially explosive contaminated materials of any nature is expressly prohibited if permittee knows, or after reasonable inquiry should have known that reasonable alternatives to open burning exist. Violation of this permit condition shall result in the imposition of civil and/or criminal penalties, as warranted, retroactively, for each calendar day of violation from the effective date of this permit. In determining what penalty shall be imposed, TDEC shall consult with REGION 4 EPA and shall take into consideration whether or not permittee has made a full disclosure of alternative treatment technologies."

"Permittee shall immediately file a verified statement more particularly describing the explosive waste that has the fewest emissions referred to in the letter, the safe alternatives for disposing of this waste, and the date on which BAE/HAAP became aware of the alternatives. Failure to provide the statement shall result in an immediate suspension or

termination of permittee's legal rights under this permit to engage in open burning of any type."

3. Open burning of materials suspected of containing Polychlorinated Biphenyls (PCBs)

On March 25 2016, Jon D. Johnston, Chief, Materials and Waste Management Branch, Resource Conservation and Restoration Division, EPA Region 4, Atlanta Ga., sent a letter to R.E. Winstead, Environmental Manager of BAE/HSAAP which outlined a verbal agreement reached between EPA and BAE/HSAAP on November 17 2015 concerning open burning of potentially explosives-contaminated demolition debris that may also contain regulated levels of PCBs (Exhibit14). To date, it is unknown to us whether or not BAE or HSAAP have signed a written, enforceable agreement. In part, the letter states "Because an unknown amount of PCBs has been burned at the burn pile area, as part of final closure the EPA expects that HSAAP will formally consult with TDEC and the EPA regarding the appropriate characterization of soil and groundwater for the products of incomplete combustion of PCBs."

We note that while HSAAP has advised EPA that it landfills any materials suspected of containing asbestos, we note that the Draft permit does not contain specific language about asbestos.

We therefore recommend the inclusion of the following language into the proposed Title V permits:

- A. Permittee is prohibited from open burning any materials that may contain PCBs or asbestos.
- B. Suspect items that cannot be safely transported for landfill disposal, due to the presence of significant explosive residue, will be characterized and if PCBs or asbestos are found, alternate

decontamination methods will be employed, followed by landfill disposal. In the event that alternate methods to burning are not feasible or successful, Permittee will consult with EPA

the proper disposal of the debris.

on

- C. If and when a Phase 4 demolition program is implemented, Permittee shall confer with EPA prior to implementation to ensure compliance with the PCB, asbestos and RCRA regulations.
- D. Any waste oil or any other type of oil potentially contaminated with explosive residue will be tested for PCBs prior to disposal.
- E. As part of final closure Permittee shall formally consult with TDEC and EPA regarding the appropriate characterization of soil and groundwater for the products of incomplete combustion of PCBs.

ORDNANCE SYSTEMS INC. 4509 West Stone Drive Kingsport, Tennessee 37660-9982 Telephone (423) 578-8010 Fax (423) 578-8054

> In Reply Reference 2804RO Federal Express Tracking Number: 7986 1827 2620

July 13, 2012

Mr. Barry Stephens, Director
Tennessee Department of Environment and Conservation
Division of Air Pollution Control
9th Floor L & C Annex
401 Church Street
Nashville, Tennessee 37243-1531

Reference:

BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53.

Dear Mr. Stephens:

BAE Systems Ordnance Systems Inc. (OSI), operating contractor for Holston Army Ammunition Plant (HSAAP) in Kingsport, respectfully submits this summary of current activities at the site's open burning grounds (sources 37-0028-10 and 37-0028-53) and the steps taken to prevent pollution from these activities from affecting areas offsite. These burning ground activities are necessary to satisfy safety and security requirements of the U.S. Army. This summary will cover four main points:

- Layout and Current Status of the Open Burning Grounds
- Extra measures taken to ensure compliance with the Title V Permit
- Recent projects status involving the open burning grounds and projected timeframe of completion
- Recent technology reviews completed by the Army

At the end of this correspondence I would hope that it is apparent that OSI and the Army recognize the potential environmental effects of the open burning of waste explosives and explosives contaminated material and successfully maintain a balance between protecting the environment and the safe and secure handling of this material to ensure that this crucial facility continues to supply safe, effective, and versatile energetic products needed to support our armed forces.

Layout and Current Status of the Open Burning Grounds

The waste explosives and explosives contaminated material open burning (OB) area is located at the HSAAP Area B facility in Hawkins County. The OB area is located approximately 0.85 Miles from the closest facility boundary and approximately 1.5 miles from the closest resident. The activities at





the OB area are permitted through Title V Air Permit 558406 and the pans are permit ted by a RCRA Subpart X Permit. All storm water runoff is collected and diverted to the onsite NPDES permitted waste water treatment facility. This summary only references the Title V Air Permit 558406 conditions as these are the only requirements related to air quality.

There are three main types of wastes. The first is bulk raw explosives that have become contaminated through contact with the manufacturing floor or out-of-spec product unsuitable for use or reprocessing. This waste is burned normally each week in burn pans. The explosive material combusts rapidly and very completely at a high temperature; producing very little visible emissions. The second type of waste consists of explosives-contaminated small articles such as plastic bags, paper towels, filters, personal protective equipment, and dewatering filter socks. This material is placed in a steel cage and is generally burned once a week even though it is permitted daily. Visible emissions are observed from this activity but usually the cage material combusts quickly. The third type of waste is large articles that may be contaminated with explosives and includes various materials, piping from buildings, process vessels, building demolition material including concrete, and possibly soil surrounding these areas. This material is placed in large piles at the burning ground and burned quarterly as permitted and produces visible emissions for a longer period. Since many of the materials that are required to be thermally decontaminated are not combustible, large amounts of clean wood are used along with small quantities of kerosene or diesel to facilitate the burning of pile material. Much of the visible emissions come from this material. This allows the material to reach the required temperatures for the required duration to ensure that these materials can be transported safely.

All explosive contaminated materials must be disposed of in accordance with the requirements of the Department of the Army Technical Bulletin 700-4 for Decontamination of Facilities and Equipment, which is by burning. Currently, no other safe alternative method can be utilized to meet the desired level of decontamination for safe handling of the material.

OSI operates the OB area in accordance with Title V Permit 558406. Only material meeting the characteristics of Conditions E5-3 and E26-3 from onsite is burned at the area in accordance with Conditions E5-5 and E26-5. Records required by Conditions E5-4 and E26-4 demonstrating compliance with Conditions E5-1, E26-1, and E26-2 are maintained and are included for 2012 as an attachment. Records are also maintained for Conditions E5-2 and E26-1 specifically to address air dispersion conditions. These conditions were established to ensure that acceptable pollutant dispersion conditions are present. OSI receives advance approval from the Division of Air Pollution Control's Johnson City Environmental Field Office for all quarterly pile burns. OSI has always followed the requirements of the permit by monitoring weather service bulletins to ensure there are no air stagnation advisories nor any EPA Air Now ozone or PM2.5 action days for the selected burn dates. However, since the quarterly burns have the potential for the highest emissions, OSI has recently taken extra measures by documenting fire weather data to ensure that the best possible pollutant dispersion conditions are present when selecting a date for the quarterly burns. At no time is any of the material burned during either an air stagnation advisory in East Tennessee or an EPA action day.







Extra Measures Taken to Ensure Compliance with the Title V Permit

In conjunction with Liesa R. Elliott, consulting meteorologist, an Excel-based tool was developed which uses information from the National Weather Service (NWS) bulletins, EPA's Air Now website, and data from the NWS fire weather website to calculate an air dispersion ventilation rate. A letter discussing this tool from Ms. Elliot is attached to this correspondence. The pile burns for the first two quarters were conducted during excellent and good dispersion conditions which allowed the plumes from these burns to be very visible from the surrounding area. Copies of the fire weather data screenshots and the calculation tool for the last two pile burns are attached for your review.

Recent projects status involving the open burning grounds and projected timeframe of completion

Over the past several years OSI and the Army have been working on removing inoperable and decommissioned equipment and structures from the site to create a better working environment and reduce the safety, security, and environmental risks with having these types of facilities on site. This has been a multi-year project and is approximately 50% complete. This has resulted in a slight increase in the amount of pile burns during the year. The burn events went from approximately two per year to four per year as permitted. The estimated completion date for the second phase of the demolition projects is in approximately three years.

Recent technology reviews completed by the Army

A March 2012 report (ERDC/EL TR-12-8) titled Alternative Treatment Options for Open Burning of Explosive Waste at Holston Army Ammunition Plant was the latest technology review conducted. Technology was reviewed for all three types of wastes currently burned at the open burning grounds. This report was prepared for the Program Manager, Joint Services, U.S. Army Research, Development and Engineering Center, Picatinny Arsenal, NJ. It includes the results of Work Unit A1040, Modernization of Industrial Base. The research was conducted by the U.S. Army Engineer Research and Development Center (ERDC)-Environmental Laboratory (EL), Vicksburg, MS, under the sponsorship of the U.S. Army Armament, Research, Development and Engineering Center (ARDEC), Picatinny Arsenal and the U.S. Army ARDEC Program Executive Office for Ammunition, Heavy Metals Office, Picatinny Arsenal.

Five commercially available technologies were evaluated with the most important consideration in the comparison being the safety profile of the system. One of the five was not considered proven to be safe and reliable for any of the waste streams at HSAAP. Of the remaining four technologies two could not be used at all for the bulk contaminated wastes and the final two could only treat the bulk materials if they were first processed through grinding. The grinding technology was not evaluated and at this point there is little information on safe and technically feasible technologies that could safely preprocess the bulk materials that currently go on the piles or the cages. It is likely that each type of waste would require a separate type of technology. The explosives waste that has the fewest emissions





appears to have other safe alternatives to open burning. However, currently because of the preprocessing step there are no other safe alternatives to open burning of the pile and cage waste.

Mr. James Ogle serves as BAE Systems OSI's primary contact for air program issues and may be reached at (423) 578-6231 or by email at james.ogle@baesystems.com. Please do not hesitate to contact Mr. Ogle should questions arise or additional information be needed.

Sincerely,

BAE SYSTEMS Ordnance Systems Inc.

R.E. Winstead

Environmental Manager

Reviewed by HSAAP Staff

cc Environmental Affairs/Ogle

HSAAP/Vestal

Environmental Affairs Files 1305/2012

BAE SYSTEMS Ordnance Systems Inc. HSAAP Title V Permit

Source #37-0028-10 Open Burning of Explosives Contaminated Waste Permit #558406 (Superceeded #547362) Conditions E5-1 and E5-4 January through December 2012 Reporting Period

Condition E5-1: "This source shall only operate during the hours between 08:30 AM and 7:30 PM daily and shall not be operated in excess of 400 hours per year."

Condition E5-4: "The owner or operator of this source with restricted operating hours must maintain a daily log of operating hours and keep it available for inspection by Division personnel. ."

Compliance Demonstration: Recordkeeping of Open Burning Activity

Limitation: 400 hours per year

Burn #	Date of Burn	Start Time	Hours	Minutes	Duration (hours)
1	01/06/2012	835	2	0	2.0
2	01/13/2012	900	1	0	1.0
3	01/20/2012	1030	1	0	1.0
4	01/27/2012	1400	2	0	2.0
5	02/03/2012	1100	2	0	2.0
6	02/10/2012	900	2	0	2.0
7	02/17/2012	910	2	0	2.0
8	03/01/2012	930	2	0	2.0
9	03/13/2012	1405	2	0	2.0
10	03/16/2012	915	2	0	2.0
11	03/23/2012	940	2	0	2.0
12	04/03/2012	1300	2	0	2.0
13	04/23/2012	1100	2	0	2.0
14	05/07/2012	1250	2	0	2.0
15	05/30/2012	1500	2	0	2.0
16	06/11/2012	1230	2	0	2.0
17	06/13/2012	1200	2	0	2.0
Г	Total Burn Time	(hours)			32.0

Date of Burn	Start Time	Hours	Minutes	Duration (hours)
3/28/2012	1000	24	0	24.0
6/25/2012	1320	36	0	36.0
0.35				
		11 38		
otal Burn Time	(hours)			60.0

Overall CY Period Burn Time	(hours)	92.0
Overall Burn Limit per year	(hours)	400.0

BAE SYSTEMS Ordnance Systems Inc. HSAAP Title V Permit

Source #37-0028-53 Open Burning of Explosive Wastes

Title V Permit 558406 - Conditions E26-1, E26-2, and E26-4 (Previously Permit #547362 - Conditions E31-1, E31-2, and E31-4)

January through December 2012 Reporting Period

Sequel Burn Report Link

Condition E26-1: "Open burning of explosive waste shall be conducted between the hours of 12:00 (noon) and 4:00 PM . . . "

Condition E26-2: "This source shall not be operated in excess of 1300 hours per year."

Condition E26-4: "The owner or operator of this source with restricted operating hours must maintain a daily log of operating hours and keep it available for inspection by Division

Compliance Demonstration: Recordkeeping of Burning of Explosives

Limitation: 1300 hours per year

	La Electronic State	Explosive Was	ste Burns	
Burn	Date of Burn	Start Time	Minutes	Duration
Number				(hours)
1	1/4/2012	1410	30	0.50
2	1/10/2012	1345	30	0.50
3	1/11/2012	1410	20	0.33
4	1/13/2012	1420	15	0.25
5	1/16/2012	1420	30	0.50
6	1/18/2012	1315	30	0.50
7	1/30/2012	1440	50	0.83
8	1/31/2012	1430	20	0.33
9	2/6/2012	1330	50	0.83
10	2/7/2012	1345	35	0.58
11	2/8/2012	1215	30	0.50
12	2/15/2012	1410	30	0.50
13	2/16/2012	1530	20	0.33
14	2/17/2012	1300	30	0.00
15	2/18/2012	1301	25	0.42
16	2/26/2012	1335	35	0.58
17	3/6/2012	1250	20	0.33
18	3/12/2012	1330	30	0.50
19	3/23/2012	1300	20	0.33
20	4/2/2012	1245	45	0.75
21	4/3/2012	1215	30	0.50
22	4/4/2012	1230	30	0.50
23	4/12/2012	1315	30	0.50
24	4/13/2012	1245	30	0.50
25	4/25/2012	1215	15	0.25
26	5/2/2012	1250	30	0.50
27	5/7/2012	1325	30	0.50
28	5/10/2012	1455	30	0.50
29	5/18/2012	1500	20	0.33
30	5/21/2012	1410	20	0.33
31	5/22/2012	1345	20	0.33
32	5/23/2012	1400	20	0.33
33	5/24/2012	1305	20	0.33
34	5/25/2012	1215	30	0.50

	ASSESSMENT OF	Explosive Was	ste Burns	
Burn Number	Date of Burn	Start Time	Minutes	Duration (hours)
35	5/31/2012	1340	20	0.33
36	6/4/2012	1400	20	0.33
37	6/5/2012	1345	20	0.33
38	6/6/2012	1205	30	0.50
39	6/7/2012	1210	15	0.25
40	6/8/2012	1230	15	0.25
41	6/11/2012	1200	30	0.50
42	6/12/2012	1200	30	0.50
43	6/13/2012	1200	30	0.50
44	6/14/2012	1230	30	0.50
45	6/15/2012	1500	45	0.75
46	6/17/2012	1300	20	0.33
47	6/18/2012	1330	20	0.33
48	6/25/2012	1240	20	0.33
49	6/26/2012	1410	20	0.33
50	6/28/2012	1405	15	0.25
51	7/2/2012	1405	20	0.33
52	7/3/2012	1405	35	0.58
	Total Bur	n Time This Per	riod (Hours)	22.5
		Burn Time L	imit (Hours)	1300.0

Liesa R. Elliott Consulting Meteorologist

3/26/2012

Liesa R. Elliott 6065 Frontier Lane, Suite 200 Nashville, Tennessee 37211

Mr. James Ogle BAE Systems OSI Holston Army Ammunition Plant 4509 West Stone Drive Kingsport, TN 37660

Dear Jimmy:

It is my understanding that you need a way to verify that the weather at the Holston Army Ammunition Plant in Kingsport, Tennessee, for each of the selected burn dates of March 27-30, are conducive for adequate air dispersion to meet the following permit condition from your Title V Permit No. 558406.

Condition E5-2 states:

It is recognized that there are two categories of explosive contaminated materials open burning. The following procedures shall be adhered to in determining whether or not acceptable pollutant dispersion conditions are present:

- (a) Daily open burning of trash container waste in the cage receptacle will not be permitted in the instance of an air stagnation advisory in East Tennessee. It will be the responsibility of the permittee to monitor the local National Oceanic and Atmospheric Administration's Weather Service Office bulletins to determine if acceptable pollutant dispersion conditions are present
- (b) Quarterly open burning of explosive contaminated materials not appropriate for burning in the cage receptacle shall be conducted only upon advance approval for each burn from the Division Air Pollution Control's Johnson City Environmental Field Office. Under no circumstances shall the permittee open burn during an air stagnation advisory in East Tennessee.

TAPCR 1200-3-4-.04(1)(h), 1200-3-4-.04(1)(k) & 1200-3-19-.05(2)

. . .

You and I worked together to develop a spreadsheet tool (see attached file) to indicate air dispersion conditions.

The spreadsheet utilizes the following criteria for acceptable dispersion conditions and burn recommendation:

- No fire, air pollution action day or air stagnation warnings,
- Calculated ventilation rates greater than 60,000 kt-ft. The ventilation rate is the mixing height multiplied by the transport wind speed, as provided by the National Weather Service (NWS) fire weather forecast. Ventilation rates greater than 60,000 kt-ft are considered good to excellent conditions for smoke dispersion,
- Predicted surface winds are equal to or greater than 5 mph during daylight hours as provided by the NWS fire weather forecast,
- Predicted surface wind gusts are equal to or less than 25 mph as provided by the NWS fire weather forecast, and
- Predicted 6-hour accumulated precipitation amounts are equal to or less than 0.05 inches as provided by the NWS fire weather forecast.

The spreadsheet tool user is cautioned if the Haines Index (HI) is greater than 5, which indicates a moderate or high potential for large fire growth. The user is also cautioned if there is any amount of precipitation predicted for the day.

It is my opinion as an Air Quality Consulting Meteorologist, that the spreadsheet tool will meet your permit conditions and indicate adequate dispersion conditions. This tool would be applicable to use for the burn dates requested, as well as future burn dates as needed by your facility.

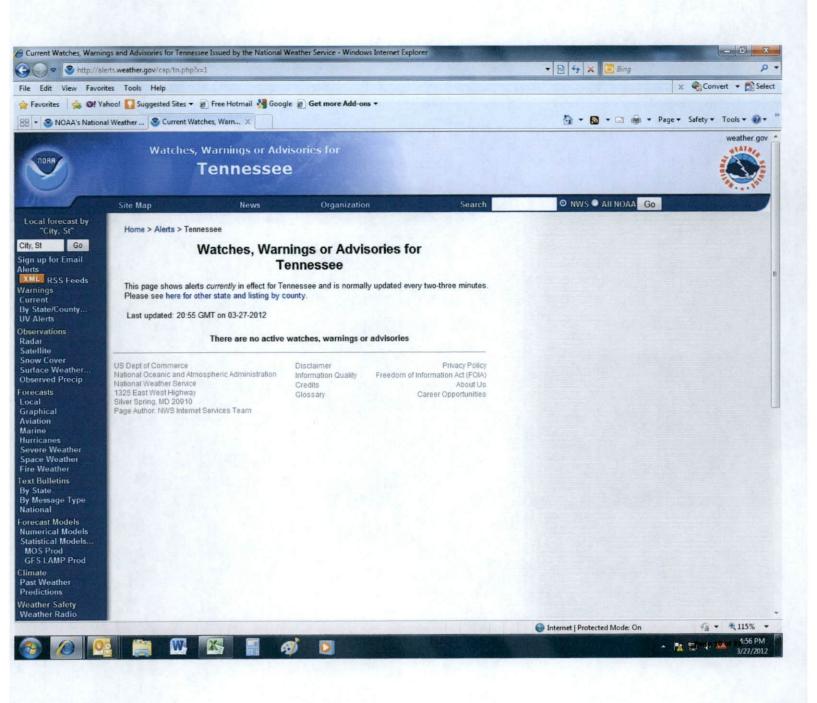
I sincerely appreciate the opportunity to work with you again, and look forward to additional collaborations in the future.

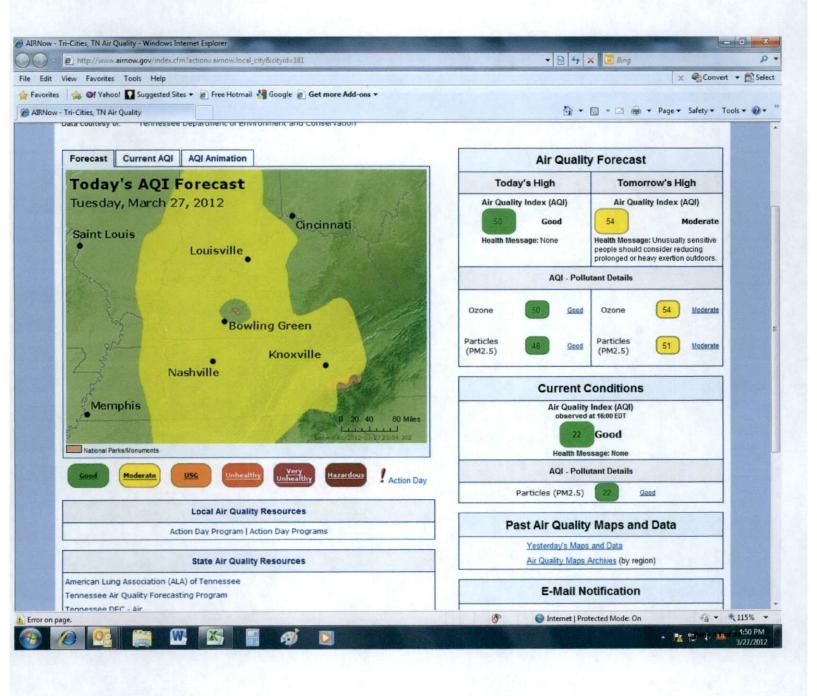
Best Regards,

Liesa R. Elliott

Consulting Meteorologist

Liesa R. Elliott





Routine Fire Wx Fcst (With/Without 6-10 Day Outlook) Tennesee Forestry District 1

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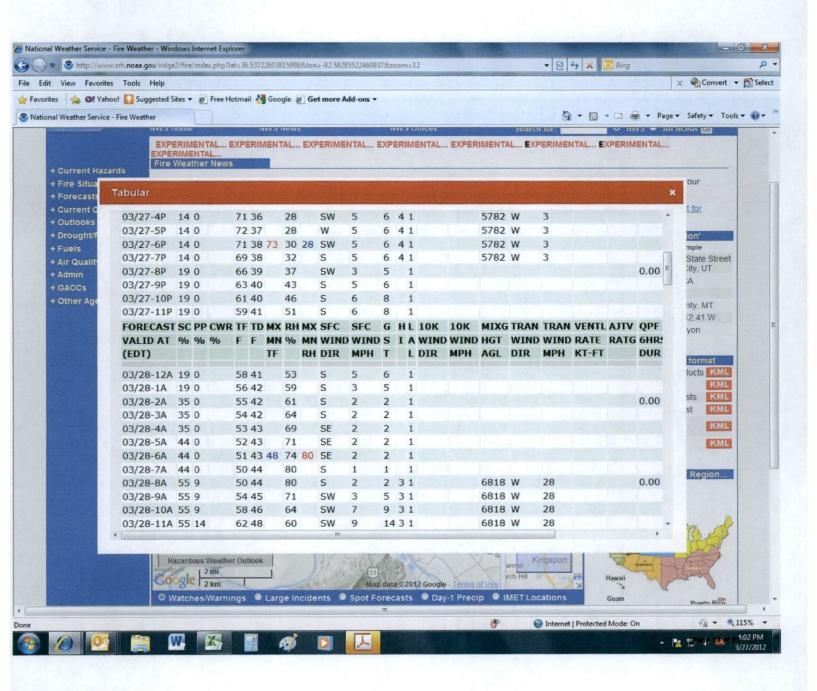
FIRE WEATHER PLANNING FORECAST FOR EAST TENNESSEE...SOUTHWEST VIRGINIA...AND EXTREME SOUTHWEST NORTH CAROLINA NATIONAL WEATHER SERVICE MORRISTOWN TN 305 PM EDT TUE MAR 27 2012

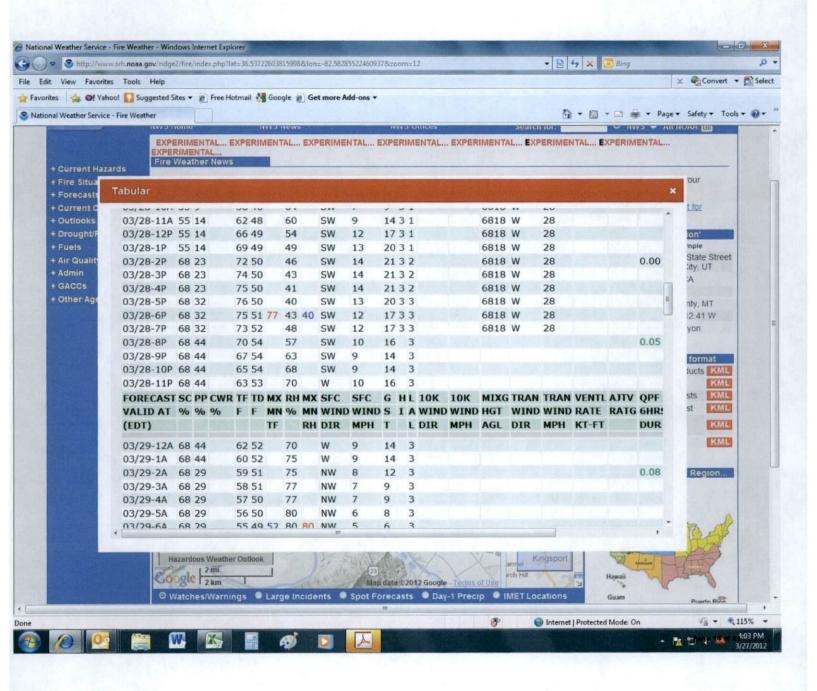
.DISCUSSION...

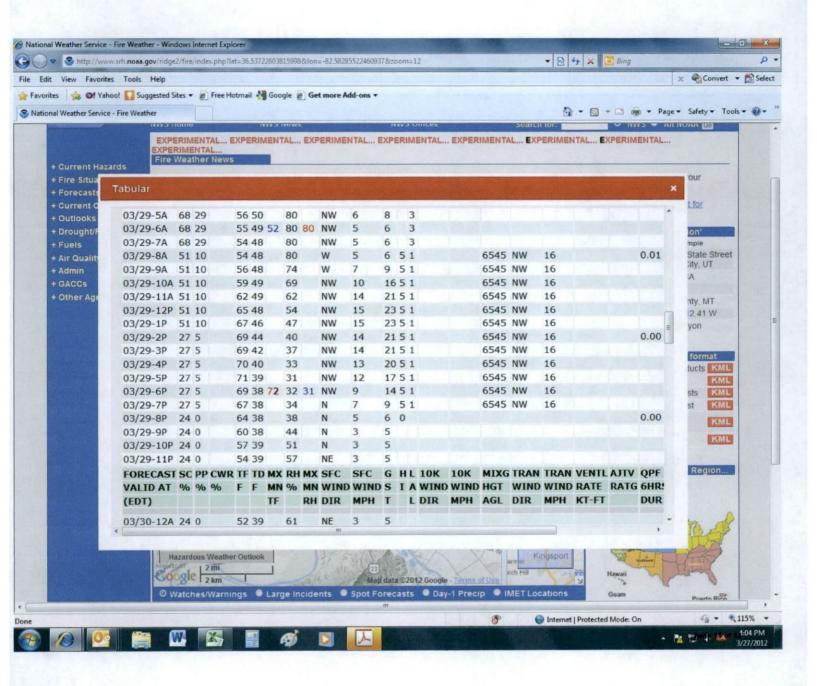
HIGH PRESSURE WILL CONTINUE OVER THE SOUTHERN APPALACHIAN REGION TONIGHT...BUT WILL GRADUALLY WEAKEN AS A COLD FRONT APPROACHES THE AREA ON WEDNESDAY. CLOUDS WILL BE ON THE INCREASE AFTER SUNRISE...WITH A CHANCE OF SHOWERS AND THUNDERSTORMS BY THE AFTERNOON HOURS. PRECIPITATION CHANCES TAPER OFF ON THURSDAY MORNING...AS THE FRONT MOVES TO OUR SOUTH. WARM AND DRY CONITIONS RETURN FOR THURSDAY AFTERNOON AND FRIDAY.

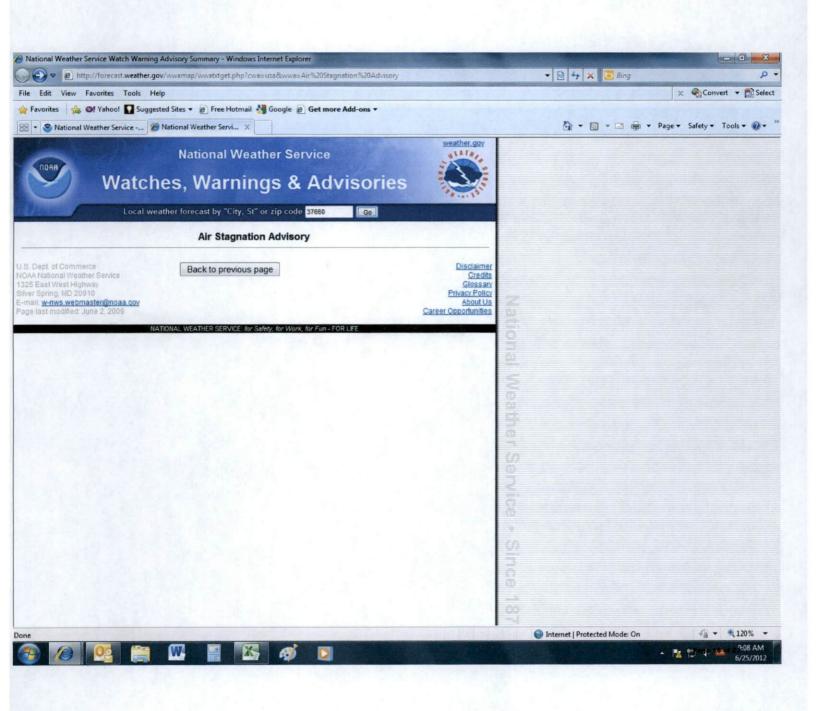
National Weather Service Morristown, TN Weather Forecast Office 5974 Commerce Blvd. Morristown, TN 37814 (423) 586-3771 Page Author: MRX Webmaster Disclaimer Credits Glossary

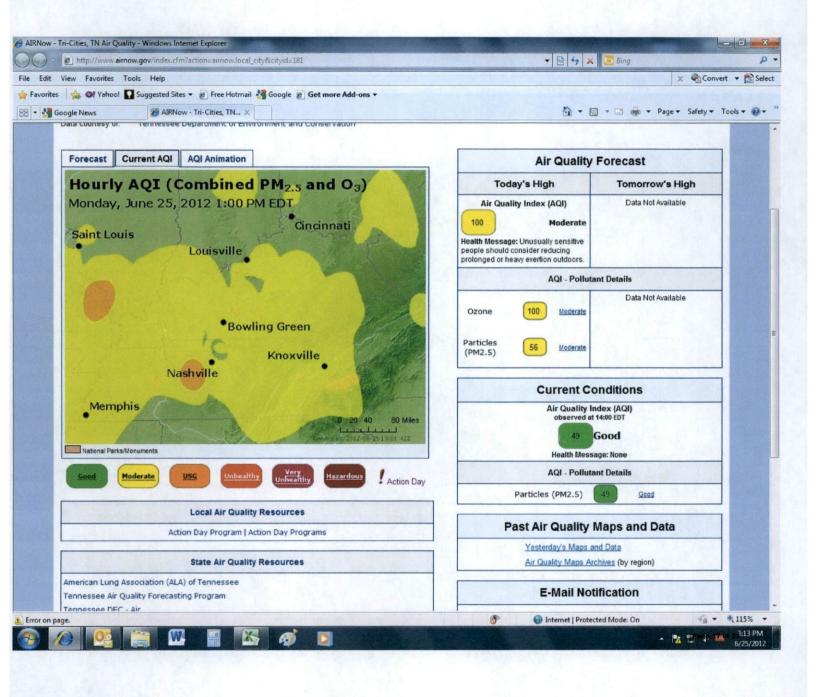
Web Master's E-mail: <u>sr-mrx.webmaster@noaa.gov</u>
Page last modified: Feb 22nd, 2011 18:19 UTC











Routine Fire Wx Fcst (With/Without 6-10 Day Outlook) Tennesee Forestry District 1

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Product Version: June 25, 2012 2:51:37 AM

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FIRE WEATHER PLANNING FORECAST FOR EAST TENNESSEE...SOUTHWEST VIRGINIA...AND EXTREME SOUTHWEST NORTH CAROLINA NATIONAL WEATHER SERVICE MORRISTOWN TN 251 AM EDT MON JUN 25 2012

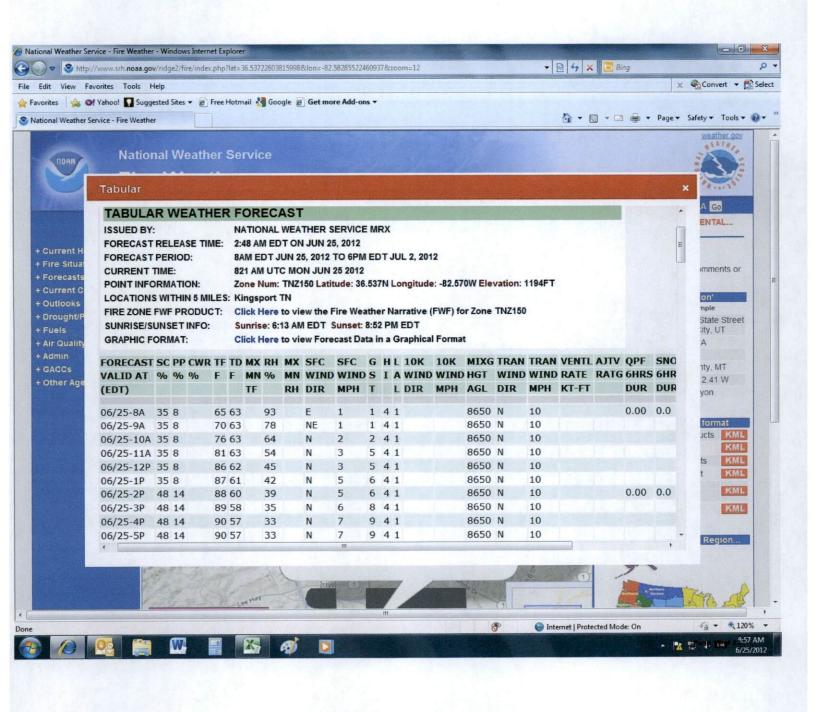
.DISCUSSION...

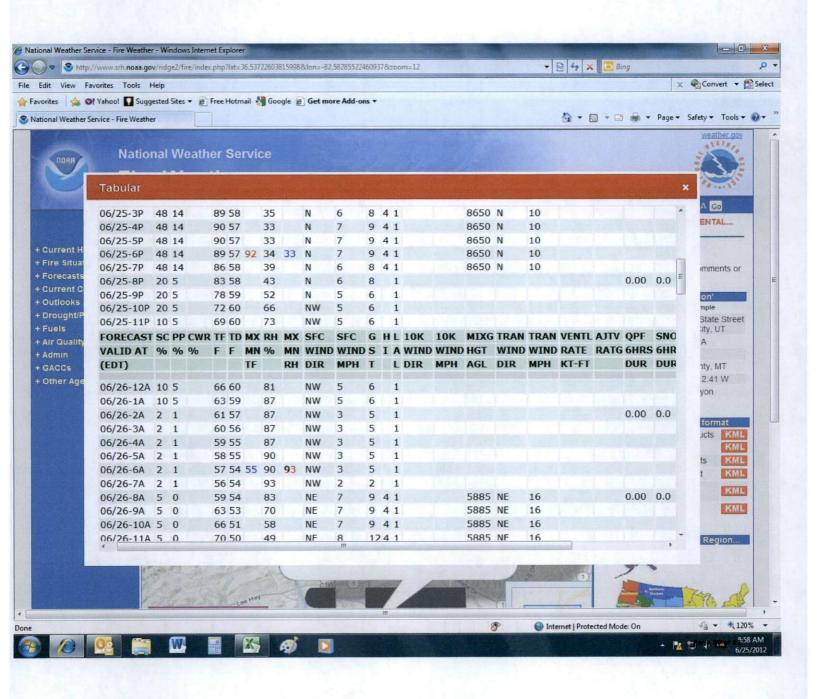
A DRY COLD FRONT WILL SWING THROUGH THE AREA TODAY...USHERING IN A BRIEF SHOT OF COOLER AIR. HIGH PRESSURE WILL BUILD IN BEHIND THE FRONT.

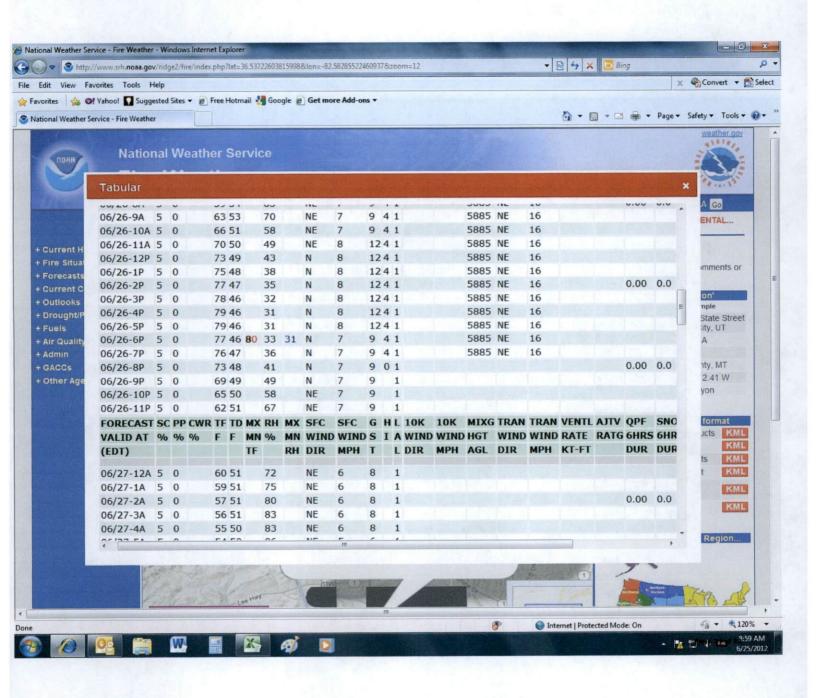
National Weather Service
Morristown, TN Weather Forecast Office
5974 Commerce Blvd.
Morristown, TN 37814
(423) 586-3771
Page Author: MRX Webmaster
Web Master's E-mail: sr-mrx.webmaster@noaa.gov

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BAE SYSTEMS Ordnance Systems Inc. HSAAP Air Dispersion Tool for Burn Events

Instruction: Enter data in the cells below based on the proposed burn date and information obtained from Linked websites for Kingsport, TN location

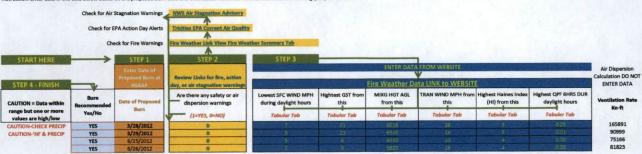


EXHIBIT 2

Fleming, Beth SES ERD

<Beth.Fleming@usace.army.mil>

Tue, Jun 30, 2015 at 4:03

PM

To: "markhtoohey@gmail.com" <markhtoohey@gmail.com>

Classification: UNCLASSIFIED

Caveats: NONE

Hi Mark,

Thanks for your call yesterday. Unfortunately, the document you're looking for, ERDC/EL TR-12-8 has been provided to our sponsor at ARDEC and is: "Distribution authorized to U.S. Government agencies only; proprietary information; March 2012. Requests for this document must be referred to Environmental Technology Group (ARDEC/Donald Yee), Building 172, Picatinny Arsenal, NJ 07806-5000."

My sincere apologies that I'm not able to be of more assistance. When we talked yesterday, I did not realize the status of the report.

Thanks,

Beth

Beth C. Fleming, PhD

USACE ERDC Director, Environmental Laboratory

ERDC Civil Works Business Area Lead

(601)634-3943

"Providing Solutions for Tomorrow's Environmental Challenges"

Classification: UNCLASSIFIED

Caveats: NONE



The Smokestack Effect: Toxic Air and America's Schools

Johnson Elementary School

School District: Kingsport City School District

National Rank 1st percentile

41 of 127,809 schools have worse air.

Exposure to cancer-causing toxics

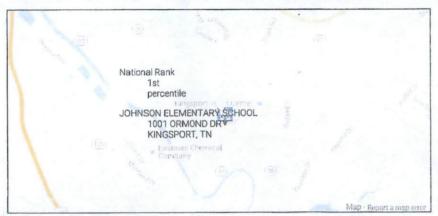
Ranked 1 of 10

Note: Rankings are based on modeled concentrations and severity of chemicals known or believed to cause cancer. Learn More

Exposure to other toxic chemicals

Ranked 1 of 10

Note: Rankings are based on modeled concentrations of chemicals that cause health problems other than cancer. Learn More



Chemicals most responsible for the toxicity outside this school

Sulfuric acid 50% of overall toxicity
Bromine 11% of overall toxicity
Arsenic and arsenic compounds 10% of overall toxicity
Chlorine 8% of overall toxicity
Cobalt and cobalt compounds 5% of overall toxicity

Polluters most responsible for toxics outside this school

Eastman Chemical Co Tennessee OperationsKingsport, Tennessee
U.S. Army Holston Army Ammunition PlantKingsport, Tennessee
Dtr Tennessee Inc.Midway, Tennessee
General Shale Brick Inc Plant # 29Kingsport, Tennessee
Weyerhaeuser Co Kingsport Paper MillKingsport, Tennessee
Sources: U.S. Environmental Protection Agency, University of Massachusetts at Amherst Political Economy Research Institute

* Chemicals most responsible for the toxicity outside this school may not add up to 100% because only the top chemicals are listed.

To report corrections and clarifications, contact the USA TODAY investigative team. For publication consideration in the newspaper, send comments to letters@usatoday.com. Include name, phone number, city and state for verification.



The Smokestack Effect: Toxic Air and America's Schools

Jackson Elementary School

School District: Kingsport City School District

National Rank 2nd percentile

1,496 of 127,809 schools have worse air.

Exposure to cancer-causing toxics

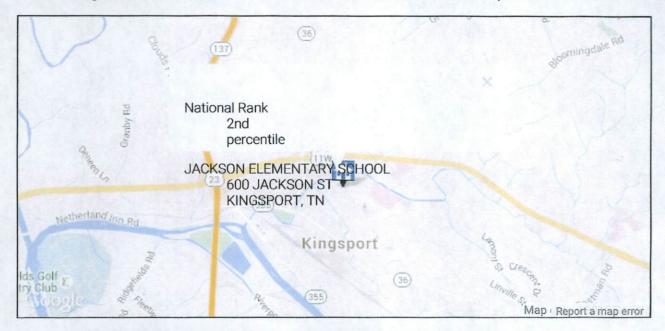
Ranked 1 of 10

Note: Rankings are based on modeled concentrations and severity of chemicals known or believed to cause cancer. Learn More

Exposure to other toxic chemicals

Ranked 1 of 10

Note: Rankings are based on modeled concentrations of chemicals that cause health problems other than cancer. Learn More



Chemicals most responsible for the toxicity outside this school

Sulfuric acid 46% of overall toxicity
Acetaldehyde 14% of overall toxicity
Bromine 10% of overall toxicity
Chlorine 7% of overall toxicity

Arsenic and arsenic compounds 4% of overall toxicity

Polluters most responsible for toxics outside this school

Eastman Chemical Co Tennessee OperationsKingsport, Tennessee Weyerhaeuser Co Kingsport Paper MillKingsport, Tennessee U.S. Army Holston Army Ammunition PlantKingsport, Tennessee Dtr Tennessee Inc.Midway, Tennessee General Shale Brick Inc Plant # 29Kingsport, Tennessee

Salvatore, Brian <brian.salvatore@lsus.edu> 2/2</brian.salvatore@lsus.edu>	/15
to me	
Hi Mark,	
You may wish to read this book chapter. Note that RDX is very different from the propellents that we are currently dealing with here in Louisiana. I understand that RDX is considered carcinogenic, but the may not be your biggest concern. During open burns, RDX produces a lot of cyanide as well as NOX molecules. Cyanide is very toxic and has been implicated as a cause of autism in children. I would like know what the autism rates are around Kingsport. Please read the section of this chapter entitled, <i>Nitrogen Dioxide and Nitric Oxide</i> .	at
https://ke.army.mil/bordeninstitute/published volumes/occ health/OHch10.pdf	
Sincerely, Brian	

Chapter 10

COMBUSTION PRODUCTS OF PROPELLANTS AND AMMUNITION

DONALD B. KIRCHNER, M.D., M.P.H., JOEL C. GAYDOS, M.D., M.P.H., AND MARIO C. BATTIGELLI, M.D., M.P.H.

(

INTRODUCTION

HISTORY OF PROPELLANTS

COMPOSITION OF PROPELLANTS
Primers and Igniters
Gun Propellants
Rocket Propellants

COMBUSTION PRODUCTS OF PROPELLANTS Primers and Igniters

Gun Propellants
Rocket Propellants

CONTAMINANTS FROM AMMUNITION

IDENTIFICATION OF HAZARDS

Conditions of Exposure Assessing Toxic Hazards Studies That Predict Toxic Exposures Toxicological Assessment of Combustion Products

HEALTH EFFECTS OF EXPOSURE TO AIRBORNE PRODUCTS OF PROPELLANT COMBUSTION

Tissue Asphyxiants Irritant Gases Inhalable Metal Particulates

CURRENT MEASURES TO CONTROL EXPOSURE

SUMMARY

^{*}Colonel, U.S. Army; Chief, Preventive Medicine Service, Madigan Army Medical Center, Tacoma, Washington 98431-5062
†Colonel, U.S. Army; Associate Professor and Director, General Preventive Medicine Residency Program, Department of Preventive Medicine & Biometrics, F. Edward Hébert School of Medicine, Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814-4799
‡Professor of Medicine (ret), West Virginia University School of Medicine, Morgantown, West Virginia 26506

that could reveal the firer's position (provide a battlefield "signature"). Substances of concern are those that could be detected by infrared sensors or that are visible to the naked eye (such as smoke or muzzle flash). While KBNO₄ is not entirely smokeless, it is considered an acceptable primer.²

Routinely used igniter mixtures are reported to include black powder (potassium nitrate, charcoal, and sulfur), nitrocellulose, mealed gunpowder, finely divided smokeless powders, and / or other substances.⁹

Gun Propellants

All solid propellants other than black powder are known as smokeless powders, although they are neither powders nor completely smokeless.¹² The basic types among these include the single-base, which are prepared by dissolving nitrocellulose in ether and alcohol; the double-base, which are prepared by dissolving nitrocellulose in nitroglycerin; and the triple-base, which are prepared by dissolving nitrocellulose in nitroglycerin with nitroguanidine added to reduce the temperature of the combustion-produced gas.¹²

Nitro-based propellant charges typically contain one to three nitro compounds and a wide variety of other added chemicals that are introduced to produce a particular, desired effect (Tables 10-2 and 10-3).

Double-base propellants are more powerful than single-base propellants, however they suffer from high propellant-gas temperatures [that] can cause excessive barrel erosion and muzzle flash. Triple-base propellants are similarly powerful, but the addition of cool-burning nitroguanidine reduces the temperature of the gas to near that of the single-base propellants. Other ingredients added to smokeless propellants are used primarily to control [the] burning rate and [to] suppress decomposition during storage. ^{12(p14)}

Recently, compounds such as the nitramine propellant RDX (research department explosive, which is also called cyclonite; see Chapter 9, Explosives and Propellants), which have traditionally been considered explosives, have been used as propellants. An RDX-based propellant is now included in the M900 round for the 105-mm tank gun. The combustion products from this propellant are expected to be dif-

TABLE 10-2
TYPICAL COMPONENTS OF NITROCELLULOSE-BASED PROPELLANTS AND THEIR FUNCTIONS

Component	Application
Nitrocellulose	Energetic polymeric binder
Nitroglycerin, metriol trinitrate, diethylene glycol dinitrate, triethylene glycol	Plasticizers: energetic dinitrate, dinitrotoluene
Dimethyl, diethyl or dibutyl phthalates, triacetin	Plasticizers: fuels
Diphenylamine, diethyl centralite, 2-nitrodiphenylamine, magnesium oxide	Stabilizers
Organic and inorganic salts of lead (lead stannate, lead stearate, lead salicylate)	Ballistic modifiers
Carbon black	Opacifier
Lead stearate, graphite, wax	Lubricants
Potassium sulfate, potassium nitrate, cryolite (potassium aluminum fluoride)	Flash reducers
Ammonium perchlorate, ammonium nitrate	Oxidizers: inorganic
RDX, HMX, nitroguanidine, and other nitramines	Oxidizers: organic
Aluminum	Metallic fuels, cross-linking catalysts
Lead carbonate, tin	Defouling agents
Vaseline, centralite	Inert materials to decrease erosion
Graphite	Recarbonate steel barrels

RDX: research department explosive; HMX: high melting explosive
Adapted with permission from Lindner V. Explosives and propellants. In: Kirk RE, Othmer PF, eds. Encyclopedia of Chemical
Technology. Vol 9, 3rd ed. New York: John Wiley;1980: 622. Additional source: Ross RH, Pal BC, Lock S, et al. Problem Definition Study
on Techniques and Methodologies for Evaluating the Chemical and Toxicological Properties of Combustion Products of Gun Systems. Vol 1. Oak
Ridge, Tenn: Oak Ridge National Laboratory; 1988. Final Report AD-ORNL-6334/V1.

TABLE 10-3
COMPOSITION AND SELECTED COMBUSTION PRODUCTS OF CHARACTERISTIC GUN PROPELLANTS

	Propellants					
	M1_	M5	M8	M10	M15	M17
Composition, wt %	1,2					
Nitrocellulose (nitrogen, %)	85.0 (13.15)	82.0 (13.25)	52.2 (13.25)	· 98.0 (13.15)	20.0 (13.5)	22.0 (13.15)
Nitroglycerin	_	15.0	43.0	_	19.0	21.5
Nitroguanidine	_	_	_	_	5 4. 7	54.7
Ethyl centralite	_	0.6	0.6	_	6.0	1.5
Diphenylamine	1.0*	_	_	1.0	_	_
Dinitrotoluene	10.0	-	_	_	_	_
Dibutyl phthalate	5.0	_	3.0	_	_	_
Potassium nitrate	-	0.7	1.2	_	_	_
Barium nitrate		1.4	_	-	_	
Potassium sulfate	1.0*	_	_	1.0	_	_
Lead carbonate	1.0*	_	_	_	_	_
Cryolite	_		_	_	_	0.3
Graphite	_	0.3	_	0.10*	_	0.15
Combustion Produc	cts, mol/g x 10	2†1,2				
СО	2.33	1.61	1.28	1.81	1.45	1.15
CO ₂	0.19	0.48	0.66	0.40	0.14	0.25
H ₂	0.88	0.34	0.19	0.44	0.92	0.57
H ₂ O	0.64	1.08	0.11	0.99	0.83	1.07
N ₂	0.44	0.48	0.54	0.46	1.29	1.30

^{*}Added if required

Adapted with permission from Lindner V. Explosives and propellants. In: Kirk RE, Othmer PF, eds. Encyclopedia of Chemical Technology. Vol 9, 3rd ed. New York: John Wiley; 1980: 627.

ferent from nitrocellulose-based propellants in that much more hydrogen cyanide and nitrous oxide (which is relatively nontoxic compared to the other oxides of nitrogen) are produced.¹⁹

Rocket Propellants

In some respects, propellants used in rockets such as the soldier-held Stinger (shown in Figure 6-4, Chap-

ter 6, Health Hazard Assessments), the Patriot air defense system, and the Multiple Launch Rocket System (MLRS), are different from those used in rifles, pistols, and artillery pieces. Successful rocket flight depends on the solid fuel's burning so that the gases produced forcefully exit rearward, thereby generating the pressure required to thrust the rocket forward. ¹⁵ One variable that is important in propulsion is related to the total surface area of the propellant mixture that

[†]At loading density of 0.2 g/cm³

¹Ross RH, Pal BC, Lock S, et al. Problem Definition Study on Techniques and Methodologies for Evaluating the Chemical and Toxicological Properties of Combustion Products of Gun Systems. Vol 1. Oak Ridge, Tenn: Oak Ridge National Laboratory; 1988. Final Report AD-ORNL-6334/V1.

²Roth J, Carpenter EL. Propellants, Solid. In: Kaye SM, ed. Encyclopedia of Explosives and Related Items. Vol 8. Dover, NJ: US Army Armament Research and Development Command; 1978: 402–473.

TABLE 10-10 SIGNIFICANT, IMMEDIATE, REVERSIBLE EFFECTS OF AMMONIA

NH ₃ (ppm)	Effects/Comments
	D 1
1,000	Produces coughing
150–500	Produces changes in ventilation minute and tidal volumes and respiratory rate
150	Produces lacrimation in subjects previ- ously acclimated at 25–100 ppm for vary- ing durations
140	Tolerated for 30 min by all unaccustomed subjects; for 2 h by highly motivated subjects
134	Produces lacrimation in 50% of unaccustomed subjects
110	Tolerated for 2 h by all unaccustomed subjects
100	EÉGL†
50–72	Produces moderate eye, nose, and throat irritation in most subjects
20–30	Odor easily noticeable

Tidal volume • respiratory rate = minute volume

[†]Emergency exposure guidance level

Source: Legters L, Morton JD, Nightengale TE, Normandy MJ. Biological Effects of Short, High-Level Exposure to Gases: Ammonia, Carbon Monoxide, Sulfur Dioxide, and Nitrogen Oxides. Rockville, Md: Enviro. Control, Inc. 1980. Final Summary Report AD A094505, DAMD 17-79-C9086.

throat. Early deaths can occur from laryngeal edema and severe airway obstruction. Patients who survive the initial exposure can develop tracheobronchitis, bronchoconstriction, and hypersecretion of mucus. ⁴⁸ Tolerance to higher exposure levels may develop over time, and eye and upper respiratory tract irritation will lessen. For example, individuals exposed in an industrial setting to an average daily workday concentration of 100 ppm of ammonia have demonstrated a tolerance to irritation after 1 week of exposure. ⁵⁰ Skin and mucous membranes are also sensitive to airborne ammonia. Due to ammonia's high solubility in water, it dissolves in the moisture of the eyes and skin, ⁵¹ and due to its alkalinity, it damages tissue by producing caustic burns.

The NAS has recommended an EEGL for ammonia of 100 ppm.²⁹ This value is based on limiting lacrimation and its consequent performance decrement. EEGLs represent levels at which reversible health effects may occur, but before judgment becomes impaired and responses to emergencies are inappropriate. No reliable information is available concerning inhaled ammonia's potential as a developmental, reproductive genotoxic, or carcinogenic agent.

The signs and symptoms associated with ammonia exposure partially depend on its concentration. Most soldiers can tolerate exposure to levels exceeding 140 ppm for short durations, but not for hours. However, asthmatics and those individuals who develop bronchospasm after exposure to other respiratory-tract irritants may be more sensitive to lower concentrations, shorter durations of exposure, or both. Exposure to levels exceeding 5,000 ppm have caused death due to airway obstruction in normal individuals.52 Bronchiectasis has also been reported in previously nonasthmatic individuals after exposure to an ammonia cloud after a tank-car derailment.⁵³ Mild-to-moderate (50-100 ppm) exposure to ammonia can produce headache, burning of the throat, nausea, vomiting, and substernal pain.

The treatment recommended for exposure to ammonia consists of removing the casualty from the source of ammonia and flushing the eyes with water if severe irritation or lacrimation develops. Severely affected casualties who have visual difficulties (such as blurring of vision or difficulty focusing), laryngeal edema, signs of pulmonary compromise, or an abnormal chest film should be hospitalized and monitored.

Nitrogen Dioxide and Nitric Oxide

Nitric oxide and nitrogen dioxide often occur together. Nitric oxide and nitrogen gas are the first products formed from the combustion of nitrogen-containing compounds. At high concentrations (> 50 ppm), nitric oxide is rapidly converted to nitrogen dioxide in the presence of oxygen or ambient air. Both gases are considered to be pulmonary irritants, but nitrogen dioxide is generally considered to be the most toxic. Nitric oxide can cause methemoglobin formation, although its potential conversion to nitrogen dioxide should be considered the more important hazard for most exposures. ^{54,55}

Workers are exposed to nitrogen dioxide during welding, electroplating, and metal cleaning; nitrogen dioxide is also a combustion product of jet-engine fuels and a byproduct of blasting operations. ⁴⁸ On the battlefield, nitrogen dioxide is formed by the oxidation of nitric oxide during high-temperature combustion of nitrogen-based propellants. Nitrogen dioxide can also be converted to nitric acid, which can damage and potentially cause fibrosis of lung tissue by denaturing tissue proteins. Tank crews can be exposed to nitrogen dioxide while they fire weapons, or, as a result of secondary fires and explosions, if tank rounds are ignited and burned inside the vehicles after battle damage or following vehicle accidents associated with fires. Nitrogen dioxide is heavier than air, reddish

brown in color, and has a pungent odor. It thus accumulates in the bottoms of enclosed spaces. (This type of accumulation has occurred in the bottoms of poorly ventilated silos that contain grasses or hay, causing farmers to be exposed to nitrogen dioxide. The pulmonary damage that occurs is known as Silo-filler's disease.) (56)

During the World War I era, German naval personnel experienced problems with "nitrous fumes" filling gun turrets when the gun breech was opened. 13,57 These nitrous fumes were probably a mixture of nitrogen dioxide and nitric oxide. For protection, naval gunners wore respirator masks. These probably contained soda-lime and activated coconut-shell charcoal. Despite wearing the masks, some of the gunners were alleged to have developed methemoglobinemia, and death occurred. The masks probably did not remove nitric oxide and may have increased the nitric oxide in the inspired air through reduction of nitrogen dioxide. As a result of these incidents, German scientists conducted creative laboratory studies to differentiate the toxic effects of nitric oxide and nitrogen dioxide. 13,57-59 Studies of these two gases and their toxic effects in military settings have continued to the present in the U.S. Army. 60,61

Because nitrogen dioxide has limited solubility, it causes negligible irritation in the upper airway tract. Acute exposure may cause little effect on the mucous membranes of the eye or throat, and thus there is little immediate warning of exposure. Exposed persons can apparently continue to breathe concentrations of up to 50 ppm for several minutes without cough, throat irritation, or chest discomfort (Table 10-11). The onset of respiratory symptoms may be delayed for 3 to 30 hours, at which time cough, dyspnea, acute pulmonary edema, fever, and peripheral blood leukocytosis may develop. 48

Nitrogen dioxide reacts with lung tissue by oxidizing cellular lipids and inactivating surfactant. Type I pneumocytes lose their integrity and allow interstitial fluid to enter the alveoli. Type II pneumocytes are then activated, become hyperplastic, and may fill up the alveolar spaces, leaving no space for gas exchange to occur. Untreated pulmonary edema may progress to death.

Death from pulmonary edema can occur at nitrogen dioxide exposures of 150 ppm for less than 1 hour. Furthermore, even if the casualty apparently recovers from an acute exposure, he or she could present 2 to 3 weeks later with signs and symptoms of *bronchiolitis obliterans*. This condition is noted for its fibrotic destruction of the bronchioles, and its signs and symptoms include fever, cyanosis, and dyspnea. ⁵² No specific X-ray findings are associated with this condition. ⁴⁸

The deleterious respiratory changes induced by exposure to airborne nitrogen dioxide are partially dependent on its concentration. Mild, irreversible effects on lung function can be observed at exposures below 5.0 ppm. At 1.0 ppm, symptoms such as coughing, chest tightness, and laryngitis can appear, but these symptoms are reversible. Individuals with asthma or chronic bronchitis may experience mild, reversible symptoms at nitrogen dioxide levels of 0.5 ppm over a 2-hour period. This level is the odor threshold for nitrogen dioxide.⁵³

Little evidence is available to assess concentrationtime exposure parameters in relation to observed health effects for nitrogen dioxide. The army uses OSHA PELs or recommendations of the ACGIH, whichever are more conservative. However, the standards set by OSHA and the ACGIH are more applicable to industrial settings. In militarily unique equipment, systems, and operations, special DA standards are devised. These may be based on guidance documents that the army has asked the AFEB or the NAS of the National Research Council (NRC) to draw up. If the

TABLE 10-11
TOXIC EFFECTS OF HUMAN EXPOSURE TO NITROGEN DIOXIDE

NO ₂ (ppm)	Exposure Time (min)	Effects/Comments
1,000	15	Immediate incapacitation; respiratory and eye injury followed by death
100	60	Immediate respiratory and eye injury with progressive respiratory injury and death
50	60	Immediate respiratory and eye irritation with possible sub- acute and chronic pulmonary lesions
25	60	Immediate respiratory irritation with chest pain
5	60	Acute reversible respiratory function effects
5	15	ACGIH's STEL
~1	60	Equivocal respiratory function effects and impaired dark adaptation of vision

STEL: short-term exposure limit

Source: Davis DL. Executive Director, Board on Toxicology and Environmental Health Hazards, National Research Council Commission on Life Sciences, to Ranadive M. The Pentagon, Washington, DC. Written communication; 14 March 1985.

question is one of toxicology, the NAS Committee on Toxicology will consider the question or issue. If there are engineering implications, the multidisciplinary NRC may be asked to evaluate this situation. In 1985, at the army's request, the NAS Committee on Toxicology reviewed a situation involving tank-gun ammunition. The army recognized the need to develop blast-proof door seals on the bustle, to ensure that combustion products of burning propellants (a situation that could occur with battle damage) would not reach tank crews in significant concentrations. The NRC's committee studied the potential problem and recommended maximum exposure levels (see Table 10-8). These limits, which are essentially EEGLs and pertain to the ability to escape a contaminated environment, can be compared to those established by the ACGIH for civilian workplaces. The ACGIH standard is more conservative (their 15-min STEL is 5 ppm).41 In a military training situation, exposures should be kept as low as possible, but at a minimum should be below the ACGIH criteria. For emergency escape purposes, the NRC guidelines should be used to assess the efficacy of hazard-control systems. However, the NRC notes that sensitive individuals may experience mild wheezing and chest tightness on exposure to 0.5 ppm of nitrogen dioxide for 2 hours.²⁸

The treatment of casualties who are exposed to nitrogen dioxide consists of removing them from the offending source, keeping them at rest, and administering oxygen. Because of the danger of pulmonary edema even in the absence of acute pulmonary irritation, close observation for 24 to 36 hours is also indicated after any significant exposure. Hospitalization is necessary for any person who has symptoms of pulmonary irritation manifested by increased pulse and respiratory rates. Supplemental oxygen may be indicated and corticosteroids may be given in lifethreatening situations, but documentation of the beneficial effects of steroids is lacking. 48,53,62

Blood methemoglobin should be measured as soon as possible after a casualty has been exposed to nitrogen oxides, especially if the casualty is cyanotic. Methemoglobin cannot transport oxygen efficiently; therefore, hypoxemia cannot easily be corrected with supplemental oxygen when methemoglobin is present. The patient may require intravenous treatment with methylene blue [3,7-bis(dimethylamino)phenazathionium chloride in a dosage of 1–2 mg/kg body weight], 33 which reduces methemoglobin's ferric iron back to the ferrous state found in normal hemoglobin:

Sulfur Dioxide

Sulfur dioxide may be formed when antimony sulfide (used in primers), sulfur (used in black powder igniter), and potassium sulfate (a flame retardant used in propellants) are oxidized. Sulfur dioxide is a heavy, irritating gas with a characteristic pungent odor. It reacts with water to form sulfurous acid and therefore mucous membranes in the eyes, mouth, and upper respiratory tract are at risk for injury. Sulfurous acid will also burn the lungs. ⁴⁸

Sulfur dioxide induces bronchoconstriction; the stimulation probably occurs via an afferent nerve after direct stimulation of its sensory end organ in the airway wall. This stimulation leads to efferent vagalinduced contraction of smooth muscle in the airway. Asthmatic subjects exposed to sulfur dioxide at 5 ppm for 5 minutes while exercising have developed bronchospastic attacks. However, research performed with normal adult subjects has shown that

- continuous exposure to sulfur dioxide at 3.0 ppm may occasionally produce a reversible decrease in small-airway compliance⁵³;
- exercise can also potentiate functional airway impairment in the presence of atmospheric sulfur dioxide⁶⁴;
- an estimated 10% to 20% of the adult population will exhibit hyperreactive airways after exposure to sulfur dioxide⁶⁴; and
- exposure to less than 25 ppm can also cause other symptoms, including irritation of the mucous membranes, increased respiratory rate and depth, and coughing.⁶⁴

Workers who are chronically exposed to 5 to 20 ppm can become acclimatized to these effects: their sense of smell becomes less acute, their reflex cough is lessened, and they are less aware of the irritation in their upper airways.⁵³ This acclimatization will not occur in soldiers who experience only intermittent high-level exposures. In general, 20 to 30 ppm of sulfur dioxide is very disagreeable.⁶⁵

Exposure limits and an EEGL have been established for sulfur dioxide; the NAS recommends an EEGL of 10 ppm for a 1-hour exposure. In addition, the ACGIH and OSHA have established time-weighted average (TWA, an average 8-hour exposure within a normal workday) exposure values of 2 ppm. 40,41

The treatment of casualties who are exposed to sulfur dioxide is to remove the victim from the source and flush the eyes with water if they are irritated or lacrimating. However, severely symptomatic individuals should be hospitalized and monitored for the

CSWAB

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July 20, 2015

Ken Feely, Regional PCB Coordination/Cleanups USEPA Region 4 61 Forsyth Street, S.W. Mail Code: 9T25 Atlanta, GA 30303-8960 Phone 404-562-8512 Feely.ken@Epa.gov

SENT BY ELECTRONIC MAIL

RE: Request for EPA Assistance in Assuring Compliance with TSCA Regulations in the Treatment of Explosives-Contaminated Wastes at the Holston Army Ammunition Plant, Tennessee

Dear Mr. Feely:

As the regulatory agency responsible for enforcing Toxic Substances Control Act (TSCA) regulations, we are requesting EPA's assistance in assuring that open air burning and thermal treatment (including heating) of explosives-contaminated wastes at Holston Army Ammunition Plant are in compliance with these regulations. PCBs (polychlorinated biphenyls) are the only chemical class specifically named in TSCA because Congress believed that the chemical and toxicological properties of PCBs posed a significant risk to public health and the environment.¹ TSCA also provides for the regulation of asbestos. EPA's immediate attention is requested as multiple sources at the site are currently active.

Human exposure to PCBs is a concern because of the wide range of adverse health effects including skin irritation, reproductive and developmental effects, immunologic effects, liver damage, and cancer. The developing fetus, infants, and children are the population groups most vulnerable to exposure. Exposure may impede the development of their brains, reproductive, immune, and endocrine systems. Emissions from open air burning may be expected to cause an increase in respiratory symptoms for individuals with asthma or other sensitive populations such as children or the elderly.²

¹ U.S. Environmental Protection Agency, TSCA Enforcement Program, accessed online July 7, 2015 at http://www.epa.gov/region1/enforcement/tsca/

² U.S. EPA, Region 5, Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin, September 22, 2003.

EPA has affirmed that dioxins (i.e., chlorinated dioxins and chlorinated furans) could be a byproduct from combustion of the PCBs found in buildings and demolition debris. In addition, polychlorinated dibenzofurans could also be formed and may be the predominant form.³

Because PCBs and dioxins are actually mixtures of semivolatile organic compounds with congeners that have a range of volatilities, PCBs and dioxins emitted to air will distribute between the vapor phase and the particulate phase (by adsorption onto particles). The vapor phase PCBs and dioxins are subject to direct uptake by the leafy parts of grass and crops; and the particulate matter can deposit onto crops and soil.⁴

Also, vapor phase and particulate PCBs and dioxins can diffuse into water bodies, deposit directly onto water bodies, and enter waterbodies via soil erosion and runoff. Both PCBs and dioxins are persistent in the environment and do not readily degrade. PCBs can travel long distances in the air (>10 miles) and deposit in areas far from where they were released.

In addition to direct exposure through inhalation, indirect pathways are possible and associated risks from these pathways could be higher. Examples of indirect pathways include uptake of PCBs and dioxins into edible crops and pasture grass, human consumption of edible crops, consumption of pasture grass by beef and dairy cattle and other livestock followed by human consumption of the livestock and milk, incidental soil ingestion and dermal contact with PCBs and dioxins in soil, uptake and bioaccumulation of PCBs by fish in waterbodies, and human consumption of fish. 6

Holston Army Ammunition Plant

The open burning area for waste explosives and explosives-contaminated material at Holston Army Ammunition Plant is located approximately 0.85 miles from the closest facility boundary and approximately 1.5 miles from the closest resident, according to BAE Systems Ordnance Systems Inc. (OSI) – the operating contractor for Holston Army Ammunition Plant. The base is located at the headwaters of the Holston River at Kingsport, Tennessee.

In December 2011, officials with the Tennessee Division of Air Pollution Control reported observing ground level smoke from Holston lingering in the general area, impacting local air quality. On multiple occasions, community members have reported and photographed ground level smoke in neighboring residential areas that coincides with open burning at Holston. These observations indicate that residents are at risk for exposure to emissions from open air burning. It is also reasonable to expect that populations in closer proximity to the various source areas at Holston, such as onsite workers and other

³ U.S. EPA, Region 5, Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin, September 22, 2003. ⁴ U.S. EPA, Region 5, Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin, September 22, 2003. ⁵ U.S. EPA, Region 5, Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin, September 22, 2003. ⁶ U.S. EPA, Region 5, Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin, September 22, 2003. ⁷ Tennessee Department of Environment and Conservation, Tennessee Division of Air Pollution Control (DAPC), online database accessed July 7, 2015 at http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=19031:34251:7106768381034::NO:34251:P34251_ROW_ID:23734

Exhibit 6

personnel, are at increased risk for exposure to the uncontrolled release of pollutants from open air burning and thermal treatment activities.

There are three main types of wastes that are burned at Holston, according to OSI.⁸ The first is bulk raw explosives that have become contaminated through contact with the manufacturing floor or out-of-spec product unsuitable for use or reprocessing. This waste is burned normally each week in open burn pans.

The second type of waste consists of explosives-contaminated small articles such as plastic bags, paper towels, filters, personal protective equipment, and dewatering filter socks. This material is placed in a steel cage and is generally burned once a week even though it is permitted daily. ⁹

The third type of waste is large articles that may be contaminated with explosives and includes various materials, piping from buildings, process vessels, building demolition material including concrete, and possibly soil surrounding these areas. This material is placed in large piles at the burning ground. ¹⁰

Since many of the materials that are required to be thermally decontaminated are not combustible, large amounts of clean wood are used along with small quantities of kerosene or diesel to facilitate the burning of pile material. ¹¹

Over the past several years OSI and the Army have been working on removing inoperable and decommissioned **equipment and structures** from the site. This has been a multi-year project and is approximately 50% complete, OSI has reported. The estimated completion date for the second phase of the demolition projects is in approximately three years.

The Holston Army Ammunition Plant is the major supplier of explosive materials – primarily RDX- and HMX-based products – to the U.S. Department of Defense, according to OSI. The EMCW (Energetic Material Contaminated Waste) generated is primarily composed of paper, plastic bags, pallets, boxes, liners, piping, and other items potentially contaminated with EM. In the past, EMCW disposal accounted for 92 percent all material disposed. Flashing has been conducted outside the open burning grounds in decontamination ovens or in one of the EMCW piles.

⁸ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

⁹ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹⁰ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹¹ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹² U.S. Army Corps of Engineers, Alternatives for Open Burning/Open Detonation of Energetic Materials, Technical Report 98/104, August 1998, page 22.

Exhibit 6

Open Air Burning of Munitions-Contaminated Wastes as a Source of PCBs/Dioxin Releases

Beginning in 2000, the Army began pressing for approval to open air burn more than 1,000 excess buildings at Wisconsin's Badger Army Ammunition Plant (Badger) – a proposal that even the military acknowledged was not environmentally friendly.¹³ Studies by the U.S. Army Industrial Operations Command at Sunflower Army Ammunition Plant in Kansas confirmed that open burning of explosive-contaminated structures produces toxic emissions including "nitrous oxide, carbon monoxide, asbestos, lead vapors, lead particulates, zinc, polyaromatic hydrocarbons, and dioxins".¹⁴

The Army study affirmed that during an open burn materials are "changed from a solid form and are released to the atmosphere where they will certainly be deposited over a large area resulting in contamination of soil and surface water". Open air burning of excess structures would pose several potential risks including:

- Potential risks to workers posed by the inhalation of vapors and fugitive particulates during the burning of the building; ¹⁶
- Potential risks to personnel and others who may be exposed to air borne vapors and dust generated during burning; ¹⁷
- Potential risks to both human receptors and environmental receptors from the deposition of air borne particulates; these deposited materials could affect both soil and surface water bodies in the area surrounding the burn site.¹⁸

In 2002, the Army at Badger first reported that high levels of PCBs had been detected in paint in buildings at concentrations more than 400 times the federal threshold of 50 ppm (parts per million). In 2003, EPA Region 5 received a draft plan and request to burn buildings at Badger as a form of demolition. Open burning of excess structures would not only cause the uncontrolled release of PCBs, it would disperse dangerous levels of dioxins and furans to the environment – toxins that are known to accumulate in the food chain and cause birth defects in humans and animals.

CSWAB maintained that if the EPA approved open burning of regulated levels of PCBs at Badger that it would set a significant national precedent. The regional office agreed and the decision was referred to EPA headquarters in Washington, DC.

During the three years that EPA considered the Army's proposed open burning of PCB-contaminated buildings, CSWAB organized a strong national campaign opposing open burning that garnered support from more than 160 organizations. We traveled to Washington to meet with federal legislators and EPA

¹³ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996, page 4-3.

¹⁴ Ibid.

¹⁵ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996, page 5–4.

¹⁶ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

¹⁷ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

¹⁸ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

headquarters, to Chicago to meet EPA officials there, and submitted dozens of Freedom of Information Act requests.

Our members sent in more than 1,400 postcards to the EPA, thousands of emails were sent to legislators, EPA officials, and the Wisconsin Department of Natural Resources (WDNR). National and local media attention – radio, television, and print – raised the visibility of the issue and our campaign. In addition to considerable citizen activism, there was significant local Congressional involvement. ¹⁹ Prominent among them were U.S. Senator Russ Feingold, U.S. Senator Herbert Kohl and then-Congresswoman Tammy Baldwin.

With support from community members, we hired an expert on dioxins. We built and strengthened alliances with communities near other bases including the Ravenna Arsenal in Ohio, Indiana Army Ammunition Plant, Sunflower Army Ammunition Plant in Kansas, and others. Community members there helped to organize grassroots support for our shared campaign to protect human health and the environment.

Collectively, these actions prompted officials at Badger to explore non-thermal solutions and the Army successfully gained approval from the U.S. Department of Defense Explosives Safety Board for wet demolition of buildings that had been previously identified by the military as **highly sensitive**. Altogether, more than **1,300** explosives-contaminated buildings that were originally slated for open air burning were successfully decontaminated and demolished at Badger using this non-thermal alternative.

At the same time, the Army at Ohio's Ravenna Army Ammunition Plant abandoned plans to open air burn more than 100 buildings. At Iowa Army Ammunition Plant, the Army used chemical neutralization instead of burning to desensitize contaminated buildings. The Army utilized indirect heat to treat explosives-contaminated buildings (without PCBs) at Twin Cities Army Ammunition Plant in Minnesota.

In 2006, after extensive multi-program discussions, EPA Headquarters confirmed that the burning of buildings with regulated levels of PCBs was prohibited and could not be approved.²⁰ Ultimately, TSCA PCB issues and local citizen opposition stopped the Army's plans for open air burning.²¹

Thermal Treatment of Munitions-Contaminated Wastes as a Source of PCBs/Dioxin Releases

Thermal treatment of painted non-flammable objects is considered the source of unsafe levels of PCBs in soils at the Badger Army Ammunition Plant in Wisconsin. Following the detection of high levels of PCBs in paint on pipes, flanges, and other metal objects, CSWAB asked state regulators to require environmental testing for PCBs at the site of a former decontamination oven — a facility used to thermally treat metal objects for explosive contamination. During operation, resultant particulates and fumes from the oven were released directly to the open air with no treatment or emissions controls.

¹⁹ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

²⁰ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

²¹ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

In 2005, testing by the Army detected Aroclor 1254 (a commercial PCB mixture) in adjacent soils at levels as high as 740 ug/kg, exceeding the EPA Region 9 Residential Preliminary Remedial Goal (PRG) of 220 ug/kg and "right at" the EPA Region 9 Industrial PRG of 740 ug/kg.

The WDNR has confirmed that temperatures in Badger's decontamination oven were sufficient to volatize PCBs and other contaminants. In correspondence to CSWAB, the WDNR wrote: "The primary PCB Aroclor used in paint was 1254 ... under heating at 450 degrees Fahrenheit it is likely that the Aroclor 1254 did volatize out of the paint." ²²

In the past, paint manufacturers used from 5 to 12 percent PCBs in paints as a plasticizer. According to the Washington State Department of Ecology, lead, mercury, cadmium, and chromium were commonly used in paint as pigments and preservatives and are found in paint on older buildings. Arsenic was used as a pigment, a wood preservative, and as an anti-fouling ingredient. Barium was used as a pigment and a corrosion inhibitor. Latex paint produced before 1992 may contain mercury which was added as a fungicide.

Accordingly, analysis of paint on structures, pipes and other equipment at Badger Army Ammunition Plant detected elevated levels of arsenic, barium, cadmium, chromium, lead, mercury, silver and PCBs.²³ (A table with these test results is attached.)

If paint is found to contain asbestos, disposal could be subject to the asbestos NESHAP (National Emissions Standards for Hazardous Air Pollutants) regulations.²⁴ Regulators held that if 1% asbestos concentration was found to be entering the decontamination oven at Badger that asbestos abatement would be required, especially as heating can cause flaking of the paint with the potential for release of asbestos into the air.²⁵

In addition to paint, PCBs were also used in other building materials such as mastics, sealants, adhesives, and specialty coatings. PCBs were a common additive to caulk because of their water and chemical resistance, durability, and elasticity. Caulk containing PCBs was used in some buildings, including schools, primarily between 1950 and 1980.

Other significant potential sources of dioxins emissions include combustion of wood, plastics, and other building components. In some instances "several tons of wood" are burned to treat a very small amount of waste at Holston, according to officials with the Tennessee Division of Air Pollution Control.

²² Wisconsin Department of Natural Resources letter to Laura Olah, Executive Director, Citizens for Safe Water Around Badger, Subject: Decon Oven at the Badger Army Ammunition Plant, July 25, 2003.

²³ U.S. Army, Badger Army Ammunition Plant, Paint Analysis Data, table obtained from U.S. EPA Region V via FOIA request in 2009.

²⁴ U.S. Environmental Protection Agency, *EPA Comments on the Tests of PCB Releases During Burning Activities At Ravenna Army Ammunition Plant – Draft Phase 1 Test Plan*, September 28, 2005.

²⁵ U.S. EPA/Wisconsin DNR, Badger WAAP Meeting Minutes, June 4, 2008. Document obtained through CSWAB FOIA request to EPA Region 5.

Asbestos

As noted above, concrete and building demolition materials are specifically identified as thermally treated wastes at Holston by the operating contractor. Asbestos was historically added to a variety of building materials and is found in concrete and concrete-like products. In addition to asbestos in the concrete itself, asbestos can be present in materials used to coat the asbestos such as paints and asphalt type coatings. Some caulks, used to seal seams or joints, contain asbestos.

There can also be asbestos concrete pipes or transite siding (a fireproof composite material made of asbestos and cement), and cement ducts embedded in the concrete. Cement-like products used to patch or fill concrete and brick may contain asbestos. Literally hundreds of cement-based products used for insulation, masonry, stucco, finishing, roads, and other applications contain asbestos. In other words, even if the concrete does not contain asbestos that does not mean that there are not other asbestos containing products that may need to be addressed.

Hubbellite is the brand name for a poured seamless floor that entered the market in the 1940s and is an example of applied flooring that may contain asbestos. **Hubbellite applied to concrete floors at Wisconsin's Badger Army Ammunition Plant contained approximately 10 percent chrysotile or "white asbestos".** Hubbellite is composed of a mixture of cement, limestone, copper and magnesium compounds, and proprietary additives. According to the manufacturer, Hubbellite flooring is fire resistant, chemical resistant (including solvents), non-sparking, and static-disseminating. ²⁶

In 1998, the EPA issued a memo alerting industry and labor organizations of the potential for asbestos in "soft" concrete in the roofs of buildings. An inspection of a roof repair project on a government building revealed that the concrete material used for forming the roof surface in 1934 contained a high concentration of asbestos. Analysis of the concrete revealed it had an asbestos content of between two and 10% by weight.

Military Formulation of Super Powerhouse insulation cement (produced from 1957 to 1971) contained 5% chrysotile asbestos and was developed to conform to government specification. This product was manufactured and sold exclusively for U.S. government military installations. (The commercial formulation without asbestos continued in production.) Both products were dry, mixtures containing spun mineral-wool, hydraulic setting binders, clays and other ingredients. Its use in or on concrete is not known.

Questions:

- Are all items and wastes subjected to open burning, thermal treatment or heating (as in a
 decontamination oven) at Holston Army Ammunition Plant tested for PCBs, asbestos and other
 TSCA-regulated substances? How is this documented and where can the public access this
 information and corresponding data?
- Is it possible that items and wastes containing regulated levels of PCBs, asbestos or other TSCA-regulated substances were subjected to open air burning, thermal treatment or or heating (as in a decontamination oven) at Holston in the past? How has this been addressed and where can the public access this information and corresponding data?

²⁶ Citizens for Safe Water Around Badger, Asbestos in Concrete at U.S. Military Bases, June 6, 2005. Accessed online at http://cswab.org/asbestos-in-concrete-at-u-s-military-bases/.

Recommendations:

- If comprehensive analysis for TSCA-regulated substances has not and is not being conducted, all
 open burning, thermal treatment and heating (as in a decontamination oven) of items and
 wastes at Holston should be <u>immediately</u> suspended until the Army can demonstrate full
 compliance with all applicable federal regulations.
- Consistent with EPA's Environmental Justice policies, the Agency should take active steps to
 promote community outreach and engagement. This should include regular public forums that
 provide community members with the opportunity to make recommendations, seek
 clarification, express concerns, and have their questions answered.

Sincerely,

aura Olah, Executive Director

Below: Photographs (6)

Attached as .pdf files:

- · Paint analysis data for PCBs and other parameters at Badger Army Ammunition Plant
- Defense Environment Alert, EPA Rejects DOD Calls for Allow Open-Burning of PCB-Coated Materials, August 29, 2006
- Record-Courier, Burn at Ravenna Arsenal Not Likely EPA Rejects Plan to Dispose of Buildings,
 September 2, 2006

CC w/attachments:

Gina McCarthy, EPA Administrator

Cynthia Giles, Assistant Administrator, EPA Office of Enforcement and Compliance Assurance Scott Gordon, U.S. EPA Federal Facilities Program, Region 4

U.S. Senator Lamar Alexander

U.S. Senator Bob Corker

U.S. Congressman Phil Roe MD

Governor Bill Haslam

Lt. Governor Ron Ramsey

State Representative Bud Hulsey

State Representative Jon Lundberg

Quincy Styke, Tennessee Department of Environment and Conservation

John C. Webb, Tennessee Department of Environment and Conservation

Ron Wilhoit, Tennessee Department of Environment and Conservation

Renée Victoria Hoyos, Tennessee Clean Water Network

Jane Williams, California Communities Against Toxics

Mark & Connie Toohey

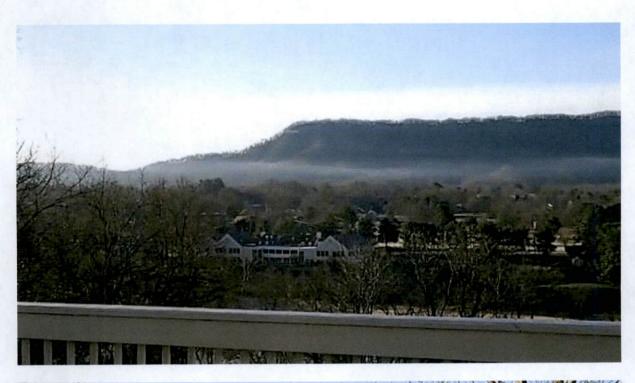
Exhibit 6

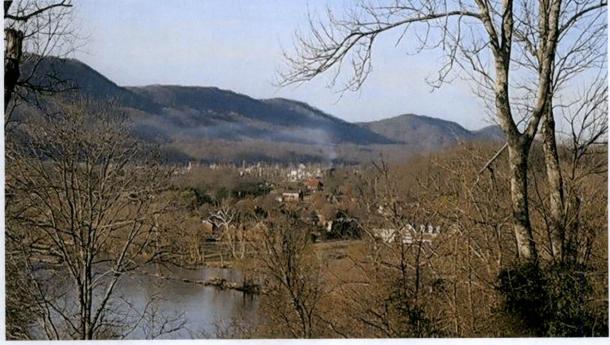
Photographs of smoke affecting residential areas near Holston AAP, December 2011 and March 2013















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An Open Letter Regarding the Proposed Open Burn at Camp Minden

To: EPA Administrator Gina McCarthy EPA Region 6 Administrator Ron Curry EPA Region 6 Superfund Division Director Carl Edlund

Governor Bobby Jindal Secretary Peggy Hatch, Louisiana Department of Environmental Quality Major General Glenn Curtis, Adjutant General, Louisiana National Guard

John M. McHugh, Secretary of the Army Craig R. Schnauder, Deputy General Counsel, Installations, Environment & Civil Works, Department of the Army

In October, your agencies collectively signed an agreement to conduct an open burn of over 15 million pounds of M6 propellant at Camp Minden along with the disposal of 3 million pounds of additional chemical explosives and propellants. We understand that representatives from each agency are meeting this week to "allow the federal government to demonstrate why it chose the open burn tray method for disposal of munitions at Camp Minden."

Since the EPA has not followed its own guidelines that mandate community involvement at each step in the decision process, the people who will be the most affected by your decisions have not been a part of the remedy selection process, nor were we invited to participate in this meeting. However, we refuse to be excluded from these key decisions that will affect us so profoundly.

We are the ones whose health and safety will be affected and whose community could suffer economic consequences from an unsafe disposal method. We refuse to be left out of the process. The EPA, the Army, and the state of Louisiana will not treat the citizens of North Louisiana any differently than any other community in any other state would be treated. We request that a Dialogue Committee be formed, as has been done in other communities, that would give citizens a seat at the table. Furthermore, the EPA, the Army, and the state of Louisiana must agree to the following:

1) Hold the meeting referred to in the January 22 letter and any other meetings where decisions are being made about Camp Minden in North Louisiana

¹ January 22, 2015 letter from Secretary Peggy Hatch of Department of Environmental Quality to EPA Administrator Gina McCarthy

- 2) Such meetings must be open to the public
- 3) Subject matter experts from the EPA who disagree with the open burn must be present as well
- 4) Local elected officials must be allowed to attend these meetings
- 5) The media must be allowed to attend these meetings to ensure complete transparency

Below are some of the most important reasons why the open burn cannot and will not be allowed to go forward at Camp Minden. Moreover, this is why you must, with community involvement, select an alternative method that is backed by scientific data to safely dispose of the propellant.

RCRA Violations

The planned open burn is not allowed under the Resource Conservation and Recovery Act and there are no waivers of the applicable or relevant and appropriate requirements discussed in either the Administrative Settlement Agreement and Order on Consent for Removal Action² or the Request for Approval of a Time-Critical Removal at the Explo Systems, Inc. Site, Minden, Webster Parish, Louisiana.³

RCRA prohibits open burning of hazardous waste:

"Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment." §265.382⁴

M6 can be safely disposed of through various other modes of treatment; the EPA's Material Safety Data Sheet clearly states that M6 "MAY ALSO BE BURNED IN AN INCINERATOR APPROVED FOR EXPLOSIVES." When a safer mode of treatment exists for a military propellant, the propellant cannot be legally disposed of through an open burn.

In the preamble to the rule where EPA adopted the exclusion for the open burning of waste explosives, EPA states:

"...a ban on open burning of hazardous wastes was contained in the General Facility Standards of the proposed regulation. This requirement has been incorporated into the interim status standards for thermal treatment because the potential human health hazards associated with the practice dictate that open burning be ended now. Comments received on the proposed standard centered around the military's need to dispose of explosives in the open. The Agency agrees that open burning and open detonation are currently the only alternatives for disposal of most munitions, and thus a modified and more detailed version of the proposed variance for waste explosives has been retained in the final rules." 45 Fed. Reg. at 33,217

Over the past 15 years, the Department of Defense Explosives Safety Board (DDESB) has certified a number of technologies as safe for the destruction of hazardous wastes that are

² http://www2.epa.gov/sites/production/files/2015-01/documents/714208.pdf

³http://www2.epa.gov/sites/production/files/2014-12/documents/final_signed_explo_action_memo_-_oct_28-2014 _v1.pdf

⁴ http://www.gpo.gov/fdsys/pkg/CFR-2011-title40-vol26/xml/CFR-2011-title40-vol26-sec265-382.xml

⁵ http://www2.epa.gov/sites/production/files/2014-12/documents/06-9530601.pdf

explosive. Those technologies have been adopted and are now in use by the Department of Defense and the private sector for the destruction of explosive hazardous waste. Some of these technologies were part of a joint technology assessment project which included the Department of Defense, the Environmental Protection Agency, the states affected by our nation's weapons stockpiles, and citizens from those states. Several of these same technologies have been adopted and employed by other countries facing the challenge of destroying older stockpiles of munitions in Europe and Asia. Since alternatives clearly exist to the open burning of munitions, the exclusion originally adopted by EPA is no longer valid.

Community exposure to Dioxins, Furans, and PCBs

Dioxins are among the most carcinogenic substances currently known to mankind. The form of dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) that contaminated Agent Orange is associated with multiple types of cancer and other serious health conditions. Dioxins, along with its highly toxic cousins, furans and PCBs, are created during open burns of aromatic organic compounds (DNT, DPB) that are in the M6 through chemical reactions with ambient chlorine in the air. Moreover, these and other products of incomplete combustion bioaccumulate in the ecosystem and in human tissue, including developing fetuses and nursing infants, who are the most vulnerable to these toxins. It is important to note that the most toxic congeners of dioxin are more carcinogenic than plutonium.

The Chlorine Chemistry Division of the American Chemistry Council states that dioxin and furan production during combustion can be minimized by:

- "1. Complete destruction of dioxins and furans and their chemical "building blocks" in waste material during combustion. This is achieved through the "3-T Rule":
 - High combustion Temperature to maximize waste destruction;
 - Adequate combustion Time (usually two seconds) to maximize waste destruction; and
 - High combustion Turbulence to distribute heat evenly and ensure complete waste destruction.
- 2. Prevention of conditions that favor formation of dioxins and furans immediately following combustion. This is achieved by the following design specifications:
 - Use a "fast-quench" of post-combustion gases by cooling them quickly from higher temperatures through the temperature range of approximately 400C down to 250C, to avoid prolonged exposure in the temperature range known to favor dioxin and furan formation; and
 - Minimize the presence of certain metals, such as copper, on particulate matter, that are known to facilitate dioxin and furan formation."

In an open burn, it is impossible to deploy conditions that minimize the formation of dioxins and furans because there is no way to control the residence time of the waste in the combustion zone, nor the turbulence of the waste material, or the cooling rate. Advanced treatment technologies are all designed to greatly increase the destruction efficiency of the waste treatment process and to curtail the conditions known to form and emit dioxins, furans, and PCBs. The wastes at Camp Minden need to be treated using these advanced treatment technologies.

⁶ http://www.louisianaprogressaction.org/2-2/317-2/

⁷ http://www.publichealth.va.gov/exposures/agentorange/conditions/

⁸ http://www.dioxinfacts.org/sources_trends/the_way.html

Dr. Gullett's studies on measuring emissions during Open Burn/Open Detonation

In the Louisiana DEQ's January 22 letter to the EPA, Secretary Hatch writes that the Army has requested the presence of the EPA's Dr. Brian K. Gullett. Dr. Gullett has been involved in multiple studies looking at the feasibility of new technology to accurately measure emissions during open burns or open detonations of munitions. The Department of Defense's Strategic Environmental Research and Development Program (SERDP) funded two of these studies. In reviewing the two SERDP studies, it is clear that much of this technology is still in the development phase and remains unproven. Thus, this research cannot be used to definitively say that open burning is safe, especially when there is so much scientific evidence showing that open burning is not safe.

The studies' own results and conclusions cite their limitations. For example, the 2010 study attempted to measure concentrations of two organic compounds, benzene and napthalene, using a remote controlled balloon to navigate scientific instruments into the plume of the burn. However, most of the Summa canisters used to measure the volatile organic compounds in that study did not function properly because of problems with the valve system. The 2012 study used similar equipment, but did not detect any volatile organic compounds using smaller Summa canisters. The authors write that "the smaller sampling volume may have limited our ability to detect these trace compounds even at high CO2 concentrations in the plumes." Such inconclusive and clearly flawed studies cannot serve as justification for the open burn of such toxic environmental poisons as DNT and DBT.

Additionally the studies do not appear to have tested for the original semi-volatile organic compounds in the propellant itself (i.e, DNT and DBT), which can vaporize as well as form a variety of extremely dangerous products of incomplete combustion, such as dioxins, furans, and PCBs. In an open burn, multiple reactions will take place because of the uncontrolled conditions and the access to potential reactants in the air. Studies that purport to demonstrate the safety of an open burn must test for the emissions of all possible toxic byproducts and must prove that the technology used to measure emissions can do so accurately.

Disagreement within the EPA about the safety and necessity of an open burn at Camp Minden

According to the EPA's own internal documents published on the Camp Minden administrative record page, it is clear that there was even sharp disagreement within the EPA, itself, about the decision to select the open burn as the only remedy that would be considered to dispose of the M6 propellant. The comments on this internal document include:

"Because alternatives to open burning are available, we should not require, or even encourage, OB in this case. The RCRA and Superfund experiences, and DOD research, show that open burning/open detonation (OB/OD) is a relatively uncontrolled, dirty, polluting technology that should therefore be reserved for situations when there are no practical alternatives or for time-critical explosives safety emergencies, and with the understanding that there will be an extensive and costly clean-up/remedial action needed

⁹ http://www.army.mil/article/39848/TEAD hosts_testing_for_OB_OD_emissions_study/

¹⁰https://www.serdp-estcp.org/Program-Areas/Weapons-Systems-and-Platforms/Energetic-Materials-and-Munitions/Munitions-Emissions/WP-1672/WP-1672/(language)/eng-US

¹¹https://www.serdp-estcp.org/Program-Areas/Weapons-Systems-and-Platforms/Energetic-Materials-and-Munitions/Munitions-Emissions/WP-2153/WP-2153

at closure, which is especially true in this case when considering the volume to be treated at Camp Minden and the presence of DNT."

The response to this comment discusses a few alternatives that the EPA considered, but does not include any of the advanced technologies that have *Department of Defense Explosives Safety Board* certificates and are capable of dealing quickly and safely with large quantities of propellant.

Another comment states, "OB/OD is not necessarily cheaper and more expedient than other options, and will result in an environmental mess that someone will need to clean up. Although cheaper initially, the full life cycle costs and environmental consequences of open burning can be significant."

A later comment states that "the list of contaminants to be monitored must include DNT (dinitrotoluene)...M6 has 100,000 ppm DNT...and dioxin (a common contaminant at OB/OD sites)." Open burns do not result in 100% combustion, and some portion of the organic compounds DNT and DBP will simply vaporize or partially combust, leading to the formation of numerous highly toxic byproducts (dioxins, furans, PCBs) in the air.

Another comment states, "there are no EPA recognized protocols for air monitoring of open burning sites. Most of the methods tried (e.g., plane, helicopter, balloons, backstops, nets, and pans on the ground) have been demonstrated to be meaningless." This means that key people within the EPA recognize that there are no reliable technologies that can adequately monitor emissions of toxins into the air during an open burn.

Because there is such obvious discord and disagreement within the EPA, all subject matter experts, including those who disagree with the decision to do the open burn, must be allowed to weigh in on the science. The public also has a right to know what all of the experts at the EPA think about the proposed open burn at Camp Minden as well as the numerous safer alternatives. Without a full and transparent discussion and evaluation of the science, the safest decision cannot be made.

The lack of community involvement in the selection of the Open Burn method

Every environmental expert that we have consulted has commented on the highly abnormal lack of community involvement in the decision making process at Camp Minden. The intent of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) and especially of SARA (Superfund Amendment and Reauthorization Act) was for the citizens directly affected in a cleanup to be involved in every step of the way, to be given access to all the scientific information, and to weigh in on the selection of a remedy. Furthermore, the EPA often gives out Technical Assistance Grants to community groups so that they can hire scientific experts, who can ensure that citizens have access to all the information needed to participate in the decision making process in an informed way.

An EPA memorandum from 2001 titled "Early and Meaningful Community Involvement" instructs EPA workers that "Early and meaningful community involvement at removals is important. Whether it is an emergency response or a non-time critical action, community involvement should not be neglected or postponed. While initial calls should be to state and local authorities, soon thereafter you should reach out to the entire community, which may have a high level of anxiety and concern about health and safety. You need to demonstrate

¹² http://www2.epa.gov/sites/production/files/2015-01/documents/714976.pdf

¹³ http://www.dioxinfacts.org/sources_trends/the_way.html

our sincere concern and credibility in order to set the stage for the community cooperation that may be critical during the response." The memo also identifies as a key practice that the EPA should "change planned actions where community input has merit."

Furthermore, the National Oil and Hazardous Substances Pollution Contingency Plan lists nine criteria that must be used to evaluate alternatives in remedy selection:

- A) Overall protection of human health and the environment.
- B) Compliance with ARARs.
- C) Long-term effectiveness and permanence.
- D) Reduction of toxicity, mobility, or volume through treatment.
- E) Short-term effectiveness.
- F) Implementability.
- G) Cost.
- H) State acceptance.
- I) Community acceptance. 15

The proposed open burn clearly does not meet the criteria for A, B, C, D, E, and I, and it may fail several other criteria as well. Clearly, the open burn does not protect human health and the environment, it does not comply with the ARARs, and it actually would increase the toxicity of the waste through the creation of dioxins, furans, and PCBs as well as increasing the mobility of the waste by putting it into the air, soil, and water where the toxic chemicals will harm humans and wildlife. The lack of community acceptance of the EPA's open burn as a suitable remedy should be clear to anyone who has been paying attention in North Louisiana.

The EPA's community relations in this project have been a disaster, and this has undermined the public's trust in the EPA and in the process. Moving forward, the EPA, the Army, and the State of Louisiana must commit to include the public in every part of the process, including in the selection of a safer remedy to dispose of the M6 propellant. No decisions can be made behind closed doors. All subject matter experts at the EPA, including those who disagree with the open burn, must be allowed to publicly weigh in on the credibility of the science.

We appreciate your cooperation in this matter. We look forward to working with you in reviewing all relevant scientific data and in selecting a safe and proven remedy for the clean up at Camp Minden.

Sincerely,

Frances Kelley

Director of Organizing, Louisiana Progress Action

Organizer, Concerned Citizens of the Camp Minden Open Burn

c: US Senator David Vitter, US Senator Bill Cassidy, Congressman John Fleming, Congressman Ralph Abraham, Louisiana State Legislature, Mayor Tommy Davis, Mayor Ollie S. Tyler, Mayor Lorenz Walker, Mayor Jimmy Williams, Mayor Carroll Breaux, Mayor Ronny Walker

¹⁴ http://www.epa.gov/superfund/policy/pdfs/early.pdf

¹⁵http://www.ecfr.gov/cgi-bin/text-idx?SID=a601ce771eb299f5408e58358f9b1206&node=se40.28.300_1430&rgn=di

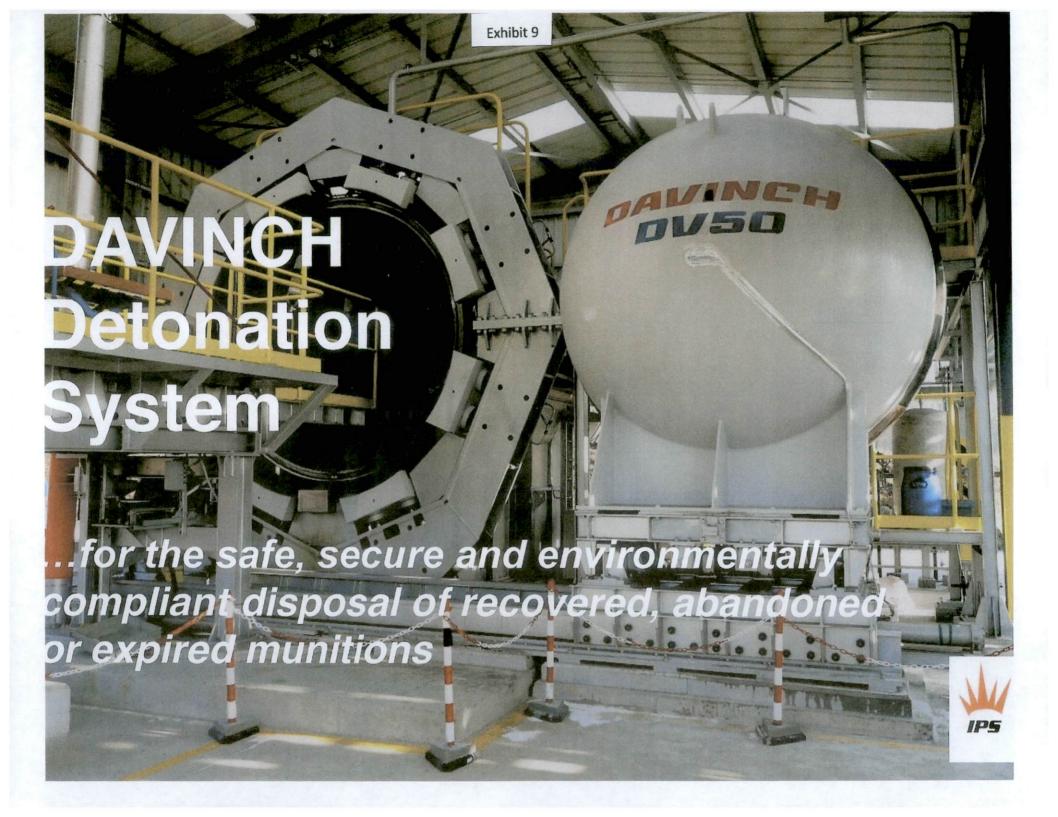
Brian Salvatore

July 12 at 8:58am · Caddo, LA

I attended the Citizens Advisory Group (CAG) meeting in Doyline last night and received the following update from Col. Stuckey, the main contractor ESI, and the EPA on-site coordinator:

- (1) Nearly 3 million lbs. of the M6 and CBI at Camp Minden has now been safely destroyed.
- (2) 9 of the 90 storage bunkers are now completely empty.
- (3) The full results of the Comprehensive Performance Test (CPT) are back. Everything of concern that was sampled was "non-detect", meaning that the system is exceeding the capabilities of the analytical labs to detect anything at all in the emissions, even after concentrating the emissions for hours during the testing.
- (4) Nitrogen oxides (NOx) are typically under 1 ppm....the EPA limit is 250 ppm.
- (5) . Potassium sulfate ash is the only byproduct of the M6 destruction process. It does not burn, but 100% of it is captured by the filtration system, and it is safe and non-toxic. 20 cubic yards of potassium sulfate ash has been shipped off to a Monroe, LA site for repurposing in oil field sludge (propant).
- (6) At the rate the crew is working (24/7) all of the M6 will be gone by March 15, 2017....my estimate.
- (7) This system is the biggest and best contained burn incineration unit in the world.
- (8) In the coming months, top EPA and US Army officials from Washington DC will be visiting Camp Minden to witness what has been accomplished here, and there will likely be substantial policy changes regarding open burning of munitions and toxic waste by the DOD nationwide, going forward.

Congratulations, Webster Parish, it looks like you really did #StopTheBurneverywhere!





ue Grass Chemical Agent Destruction Pilot Plant

FOR MORE INFORMATION CONTACT:

Drive, Suite 2 Richmond, KY 40475

Blue Grass Army

Blue Grass Chemical

Supercritical Water Oxidation

The Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) will safely destroy a chemical weapons stockpile that comprises more than 500 tons of chemical agent in weapons stored at the Blue Grass Army Depot. The plant will eliminate these chemical weapons using a two-step process.

Step one consists of a process that will neutralize the chemical agent. The munitions will be disassembled to separate the agent from the energetics, which will then be mixed separately with either a caustic solution or water to destroy the chemical agent and energetics before being temporarily stored for later treatment. The resulting byproducts are known as hydrolysate.

Step two involves a secondary process called supercritical water oxidation (SCWO), which will be used for final treatment of the hydrolysate at BGCAPP. This fact sheet explains how SCWO works and provides background information on how it has been tested in preparation for use at BGCAPP.

The Science of SCWO

The SCWO process will blend water, fuel, air and hydrolysate together in a specialized vessel at temperatures and pressure conditions above the critical point of water.

A supercritical fluid is defined as a substance that is above a specific temperature and pressure, known as its critical point.

The critical point is unique for every substance. For water, the critical temperature and pressure are 705 degrees Fahrenheit and 3204 psi, respectively. Above the critical point, the liquid and gaseous phases become indistinguishable - existing neither as a liquid nor a gas, but as a homogeneous dense fluid. Water above its critical point is referred to as supercritical water, and may be thought of as very dense steam.

Supercritical water has unique properties and is much different from water at room temperature. Salts and other polar compounds that are normally soluble will drop out of solution at

supercritical conditions. On the other hand, nonpolar organic compounds — materials that normally form a separate phase when mixed with liquid water — become highly soluble in supercritical water and are quickly converted to form carbon dioxide and more water in the presence of oxygen (also fully soluble).

For instance, imagine taking a glass of salt water with an oil layer on top and increasing the temperature and pressure above the critical point of water to supercritical conditions. The salt would separate from the water, and the oil would fully dissolve, leaving you with a glass containing a dense oil-water mixture at the top and salt at the bottom. If oxygen were added, the oil would rapidly and cleanly oxidize to form carbon dioxide and water. In a similar manner, the organics in the hydrolysate channel and oxygen mix together in the SCWO vessel and react to break down the hydrolysate, creating carbon dioxide, water and salt products.

After concentration, this brine solution will be shipped off site to a licensed treatment. storage and disposal facility. For conservation purposes, about 70 percent of water used in the SCWO process will be recycled back into the BGCAPP facility.



This computer graphic illustrates the SCWO reactor vessel, which will combine water, fuel, air and hydrolysate. The hydrolysate is oxidized to carbon dioxide, water and salts.



A Partnership for Safe **Chemical Weapons** Destruction







Testing Ensures Performance

SCWO is a tested and proven technology. There are currently six full-scale SCWO plants operating worldwide, including one at the Defense Ammunition Center at the McAlester Army Ammunition Plant in Oklahoma. Others are located in France, Japan, Korea and the United Kingdom. However, BGCAPP will be the first industrial-scale facility to combine the two technologies of neutralization and SCWO. As a result, the Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA), which is responsible for the destruction of the Kentucky chemical weapons stockpile, has conducted more than 7,000 hours of testing on the SCWO process. An additional 12-month full-scale testing period was completed at the SCWO fabrication facility prior to sending the units to the BGCAPP site. As with all BGCAPP systems, once the SCWO units are completely installed at the BGCAPP site, further testing will be completed until operational conditions are satisfactorily established, and the BGCAPP team is confident that SCWO will be a safe and efficient secondary treatment process.

The National Academies of Sciences, Engineering and Medicine (NASEM), formerly the National Research Council, evaluated the SCWO Intermediate Design and Technical Risk Reduction Program in July 2006. NASEM recommended additional testing using a full-scale reactor at full-scale conditions. Teams from PEO ACWA and Bechtel Parsons Blue Grass addressed NASEM's recommendations by completing the full-scale testing period referenced above.

In addition, the Army Research Office convened an independent panel of SCWO process experts and evaluated PEO ACWA and Bechtel Parsons Blue Grass' intended path forward in September 2006. The panel evaluated the Technical Risk Reduction Program to determine if adequate measures were in place to address the risks identified by NASEM. The panel concluded that the testing to be conducted was adequate.

The use of neutralization followed by SCWO has been independently reviewed and endorsed by the governor-appointed Kentucky Chemical Demilitarization Citizens' Advisory Commission.

Dear Mr. Toohey,

Thank you for contacting us again. As I understand from the information you provided, HAAP currently uses open burning for disposal of residual explosives, and potential explosive contaminated materials (filters, washcloths, bags, wood, piping, etc.). El Dorado Engineering specializes in systems to safely dispose of these types of materials.

We have both "off-the-shelf" alternatives and custom designed alternatives according to our clients requirements. We would need to receive some additional detailed information to determine which alternative(s) would be the best fit for the HAAP application. Alternatives shown on our website which we would initially consider to likely be feasible include:

- Contaminated waste processor (designed to treat large quantities of explosive contaminated filters, bags, pallets, etc. and small quantities of residual explosives) and
- Contained burn systems (designed to burn large quantities of residual explosive materials and small quantities of contaminated trash).

Depending on the types and quantities of workload a single system can likely be fielded to handle the majority of waste materials currently being open burned. Typically, we discuss with our prospective client the detailed composition and configuration of their materials, especially the energetic compounds involved, as well as their hourly or daily throughput, and specific handling requirements in order to provide the best technical and economical solution. Often when a client has a wide variety of waste item types we can first perform a small consulting analysis to define their workload and determine the optimal system type and size.

We would be happy to enter into a dialogue with the appropriate parties to discuss this further. Let me know your thoughts on how best to proceed.

By coincidence, I just returned yesterday from the stack testing at our facility in Minden. The stack had no smoke (zero visible emissions) and the data I witnessed showed excellent results for elimination of both fine particulate and potential gaseous pollutants, the formal report will be out in a few weeks.

Best Regards,

Bob Hayes President EL DORADO ENGINEERING Phone: (801) 966-8288

Exhibit 11

From: Mark Toohey [mailto:markhtoohey@gmail.com]

Sent: Thursday, May 26, 2016 2:47 PM **To:** <u>bhayes@eldoradoengineering.com</u>

Subject: Holston Army Ammunition Plant, Kingsport , Tn (HAAP)

Dear Mr. Hayes:



This email has been checked for viruses by Avast antivirus software. www.avast.com

Mark Dear Mr. Hayes, Thank you for your prompt response. HAAP also has, in that 27 rec...

Bob Hayes

 bhayes@eldoradoengineering.com>

May 31

to me, rfrandsen

Dear Mr. Toohey,

Yes, our equipment can treat construction materials per your description. We have utilized our transportable flashing furnace (TFF) to decontaminate these types of materials when similar facilities are demolished. In fact one of the first applications for the TFF was for the remediation of the Ravenna site, which involved decontamination of buildings and equipment being demolished.

Of course our standard transportable unit is not designed to treat piles that are two stories high in a single batch. Generally it is straightforward to separate the materials into acceptable batch sizes to fit inside the standard flashing furnace volume (approx. 5' X 7 ' X 17') and within the maximum batch load weight (10,000 lbs max. per batch).

I have attached a brochure on the TFF for your reference.

Best Regards,

Bob Hayes President EL DORADO ENGINEERING Phone: (801) 966-8288

Exhibit 11

From: Mark Toohey [mailto:markhtoohey@gmail.com]
Sent: Friday, May 27, 2016 7:27 AM
To: Bob Hayes

Subject: Re: Holston Army Ammunition Plant, Kingsport , Tn (HAAP)

Attachments area



EL DORADO ENGINEERING INC.

2964 W 4700 S, Suite 109 • Salt Lake City, UT 84129 • Tel: (801) 966-8288 • Fax: (801) 966-8499

APPLICATIONS FOR THE EL DORADO ENGINEERING TRANSPORTABLE FLASHING FURNACE (TFF)

INTRODUCTION

El Dorado Engineering, Inc. (EDE) has designed and fielded Transportable Flashing Furnace (TFF) systems for treating potentially explosive contaminated materials, small arms ammunition, and other energetic materials. Owing to its superior performance, true transportability, robust design, ease of use, high throughput capability, and inherent safety, this technology has proven to be very versatile with successful projects at numerous sites. The TFF technology was originally conceived by EDE to be used for thermal decontamination of range debris during remote range cleanup operations so scrap metal could be certified as 5X and sold for recycling. One of the earliest EDE TFF units was successfully used to treat over eight million pounds of explosive contaminated scrap metal in support of the reclamation project in Kaho'olawe, Hawaii. EDE TFF units have been used widely at other remote range sites to flash potentially contaminated scrap metal. This technology has also proven useful for a wide variety of other applications. Some example projects include: remediation operations in treating explosive contaminated equipment in the demolition of Ravenna Army Ammunition Plant; small arms ammunition disposal at Eglin Air Force Base and Hill Air Force Base; thermal treatment of live fuze components for cleanup at Talon W.V. site; flashing explosive contaminated metal components from the missile recycling facility at Anniston, Alabama; and decontamination of commercial waste components containing energetic materials.



The large workloads, variety of applications, and a recently completed ESTCP contract have provided opportunity to study the operations in more detail and optimize design and operations. Based on these successful TFF applications, this technology has been well demonstrated for processing/explosive contaminated metal debris so that it can be sold directly as scrap metal as well as processing small live items.



FIGURE 1: The US Army developed a simple flashing furnace with a rolling hearth (seen processing 750 lb. bomb shells)

Because of mounting public and environmental regulatory pressure, it was proposed that explosive contaminated combustible materials be added to the flashing furnace feed stream. Many of these materials burn all day long in the open, generating thick, black smoke. These materials often had to be reburned, as they burn so poorly. While working for the Army, EDE personnel were assigned to modify the flashing furnace to process combustible explosive contaminated wastes. Modifications consisted of adding combustion air, an unfired afterburner, and a complete pollution control system. A larger version of the furnace was also designed to provide greater throughput and to decontaminate 20' sections of pipe. This system became known as the Contaminated Waste Processor (CWP).

THE EDE TRANSPORTABLE FLASHING FURNACE (TFF)

As noted above, the legacy CWP was intended to provide not only flashing, but also combustible waste burning. All of the Army installations were stationary. EDE decided that by eliminating the additional combustible waste processing capabilities the flashing furnace technology could be made transportable, and it could be deployed to field locations to service small or temporary needs that would not justify a full, fixed installation.

EDE designed a TFF to meet the following specifications (see Figures 2, 3, 4):

- Transportability: Totally contained on a 48' long trailer, transportable over highway (as seen below in Figure 2).
- Nominal internal dimension: 5' high x 7' wide x 17' long
- Bottom rolls out for easy loading of large, heavy, or awkward batches
- Cycle time is 45 to 90 minutes, depending on load size
- · Ceramic wool insulation to allow rapid heat up and cool down
- · Cooling air for rapid cool down
- Unfired afterburner to minimize emissions
- Main controls on trailer; pendant mounted controls for remote operation for safety
- Burners: Oil-fired dual burners with propane pilots; 6MMBTU/hr capacity
- Standard operating temperature: 1000°F
- Temperature recording to verify each load temperature
- Optional electric generator and fuel skid available
- Field set up and take down in approximately one day
- Up to 10,000 lbs. can be loaded in a single batch typical operation is 2 ½ tons per hour



FIGURE 2: All components are stored on a single trailer for shipping

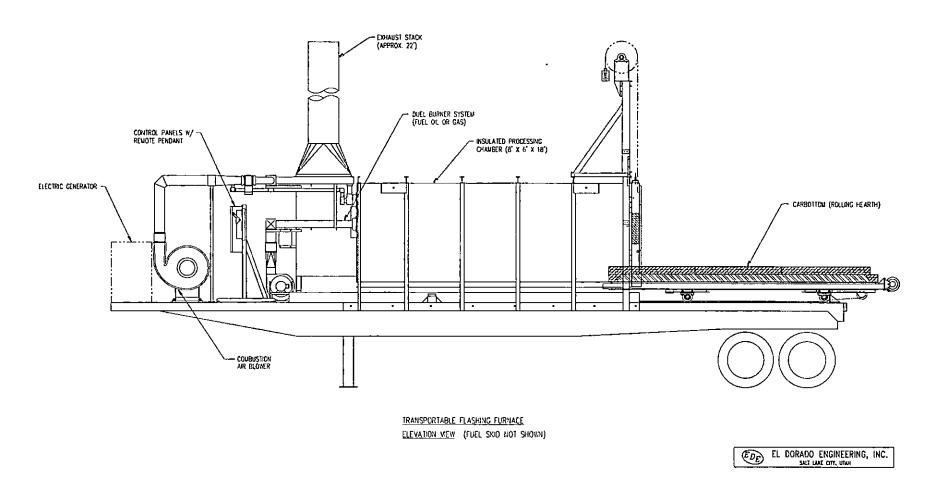


FIGURE 3: The TFF fits on a standard 48 foot trailer

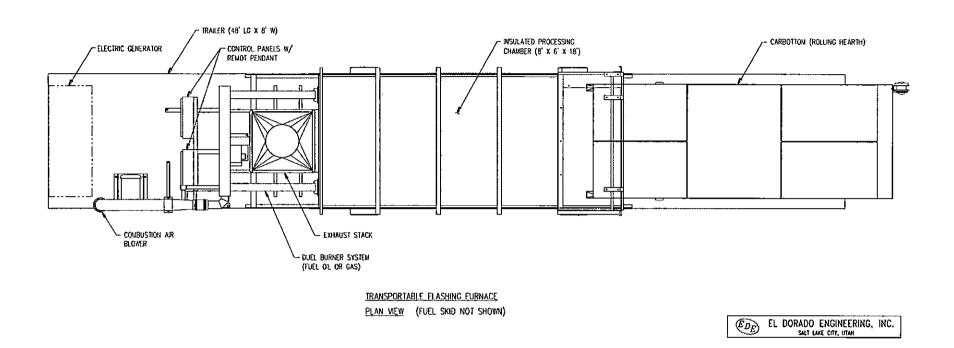


FIGURE 4: The layout includes an optional electric generator

Economy Model TFF

In talking to perspective users EDE has found that not everyone needs a two ton/hr unit, and EDE developed an economy model (TFF-EM) with the following features as shown in Figure 5.

- Totally contained on a 24' trailer
- · Quick set-up time: less than 4 hours
- · Simple, low-maintenance design
- Single burner: 1.4 mbtu/hr
- Single fan for both combustion and cooling air

 ☐ 1000 pound capacity
- Internal space: 6' wide x 5' high x 8' deep

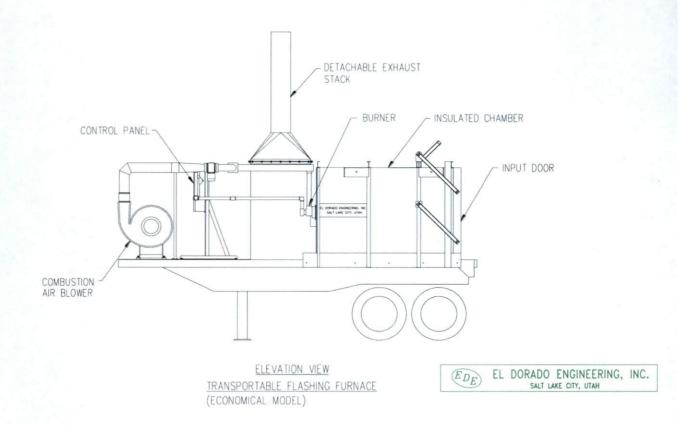


FIGURE 5: Transportable Flashing Furnace - Economy Model

ISO Flashing Furnace

When interest for this equipment was expressed by overseas clients, EDE developed a design for a flashing furnace contained within an ISO container to facilitate overseas shipment. This ISO Flashing Furnace design is depicted in Figure 6.

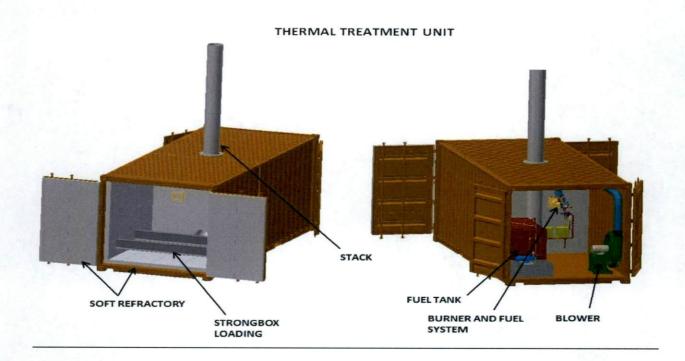


FIGURE 6: ISO Flashing Furnace

APPLICATIONS

In 2000, EDE completed the design and fabrication of the first Transportable Flashing Furnace (TFF), which was procured by MKM Engineers of Stafford Texas. EDE delivered this first TFF to MKM at the Ravenna Army Ammunition Plant in Ohio. MKM assisted in the disassembly and decommissioning of the plant, associated structures, and equipment. A large amount of metallic equipment and piping was potentially contaminated with explosives. Controlled thermal decontamination of this 3X material to a 5X level in a TFF allowed the materials to be sent to public salvagers and scrap dealers.

EDE provided a second TFF to Eglin Air Force Base to treat and dispose of small arms ammunition that were previously disposed of by open burning. Small arms up to 30MM

• TPT are placed in heavy gauge steel strong boxes and put on the rolling hearth for processing. This unit was transported to Hill Air Force Base to process a large inventory of live munitions and metal slugs and then returned to Eglin Air Force Base.

A third TFF was delivered to Parsons/UXB Joint Venture for Kaho'olawe, Hawaii, range cleanup purposes. It was used to process munition fragments and target debris prior to shipment from the island. The materials processed in this application are similar to the explosive contaminated debris produced by active test ranges.

Since this time many other TFF and TFF-EM units have been provided, which have been used for applications ranging from flashing potentially contaminated metal from a U.S. army missile recycling facility, cleanup at numerous remediation sites, and treatment of commercial energetic wastes. EDE has also provided stationary units as a popular options on EDE's turnkey Explosive Waste Incinerator (EWI) demil plants such as the one shown in Figure 7, provided for a NATO (NSPA) Albania project.

POLLUTION CONTROL & PERMITTING

Materials to be flashed are neither RCRA listed wastes, nor do they exhibit the characteristics of reactive wastes, therefore TFFs do not typically require RCRA permits. Since emissions from the furnace were projected to be well below *de minimis* levels in Ohio, the Ohio regulators and EPA agreed that the unit does not require an air permit. The determination that no permits are required for flashing makes the unit truly transportable. Although the emissions from flashing operations are expected to be below *de minimis* levels in other states as well, this determination must be verified in each intended state. The units built to process RCRA wastes require a RCRA Subpart X permit for miscellaneous units. The TFF in Hawaii was used to process military test range material as part of a remediation project, and similar to the one in Ohio, does not require a permit. The application and permitting requirements are summarized in Figure 8.



FIGURE 7: Flashing Furnace Technology Transfer

- Kaho'olawe Island
- -Used to treat 10 million pounds of scrap metal in UXO reclamation project
- -No permit required
- •Ravenna Army Ammunition Plant
- -Used for remediation operations in treating explosive contaminated equipment/materials
- -No permit required
- •Eglin Air Force Base
- -Used to dispose of small arms ammunition
- -Required Strong Boxes & RCRA Subpart X permit
- •Hill AFB
- -Used to treat 20mm TPT (training practice target) rounds
- -Required Strong Boxes & RCRA Subpart X permit
- -Brass recycled

KAHO'OLAWE EXPERIENCE & TESTS

As mentioned, EDE provided a TFF for the Parsons/UXB joint venture to help in the clean up of Kaho'olawe Island in Hawaii. For several decades the military used this island for target practice. The state of Hawaii required that it be cleaned up and restored to its natural environment. In order to clean up the island, all of the metal fragments from the years of bombing and shelling needed to be removed. To ensure safety and eliminate the costs associated with shipping potentially contaminated materials, a TFF was purchased (Figure 9) and set up on the island. Figure 10 shows the system fully assembled in Hawaii.



FIGURE 9: Furnace on its way to setup site on Kaho'olawe

This furnace flashed over ten million pounds of metal. This large workload provided an opportunity to study the operations. Parsons/UXB ran a series of tests for the Navy Facilities Engineering Command Pacific Division, and documented information that was already generally believed or known, and also discovered new information that was not intuitively obvious. The original test data for this furnace came from Army tests of placing thermocouple trees in the workload and checking the temperatures of the metal. Previous Army tests were on batch loads of washed out bomb and projectile bodies with a lot of weight, but not as densely packed as the Kaho'olawe materials (see Figure 11).

TB700-4 does not state a required temperature for thermally treating explosives. EDE had recommended a nominal furnace set point temperature above 1000°F as this is the

temperature used in the Chemical Munitions Demil criteria for both explosives and chemical warfare agent decontamination and is known to be well above the survivability temperature of explosives.



FIGURE 10: Furnace ready for processing on Kaho'olawe



FIGURE 11: Workload at Kaho'olawe

Independent Parsons/UXB tests provided the following information:

Workload: 117 containers, 241,000 lbs mixed debris

- -20mm TPT rounds, loose
- -20mm TPT rounds in deformed ammo boxes
- -Miscellaneous metallic scrap -Miscellaneous UXO





FIGURE 12: Hill Air Force Base Application



FIGURE 13: 5.56 mm After Processing at Letterkenny Army Depot

TFF OPERATIONAL SAFETY

EDE, to our knowledge, has never had an accident or injury with any of the equipment we have designed. We put safety foremost in all that we do. EDE will provide a safe environment for all personnel.

The EDE TFF is designed to ensure personnel safety and minimize potential for equipment damage. The TFF is designed with strongboxes to serve as primary containment for live items, with the furnace providing secondary containment. Operating personnel maintain a safe standoff distance during furnace operations with control via remote handheld pendant. The TFF is designed to vent during an unplanned detonation event to minimize equipment damage.

During Kaho'olawe range cleanup an unplanned detonation of a very large shell occurred in the TFF; personnel were safe and the equipment sustained minor damage, repairable and operational in about one week. Another operation sustained an unplanned mass propagation of fuze detonating components during testing of new items, resulting in minor damage repairable in one day.

OPERATIONAL REQUIREMENTS

Labor

Not counting the workers required to unpack the ammunition, which varies according to types of items, the TFF can be operated by two workers: one main operator and a forklift driver for loading and unloading.

Maintenance

Routine, simple maintenance can be scheduled during the daily start-up time each shift. Routine maintenance of one-two hours per month may be required during non-operating times.

Power Requirements

The TFF is powered by an on board diesel fueled generator.

Fuel

The TFF typically operates on a #2 fuel oil or propane. Propane is also required for pilot operation but usage is minimal.

INSTALLATION AND COMMISSIONING

Installation is very simple with typical setup time of about one day. Initial commissioning and comprehensive training takes about one week.

18

TFF POLLUTION ABATEMENT SYSTEM OPTIONS

The standard TFF is equipped with an "unfired afterburner" insulated section downstream of the furnace chamber that provides for additional residence time at elevated temperatures, which minimizes CO and VOCs production.

As an option, EDE has developed a companion Transportable High Efficiency Particulate Abatement System (THEPAS) which utilizes a second trailer to provide gas cooling, fabric filtration, HEPA filtration, and an ID fan. This system removes well over 99% of all particulate (smoke, metal oxides, including lead) from the exhaust. A photo and drawing of THEPAS are provided as Figures 14 and 15.

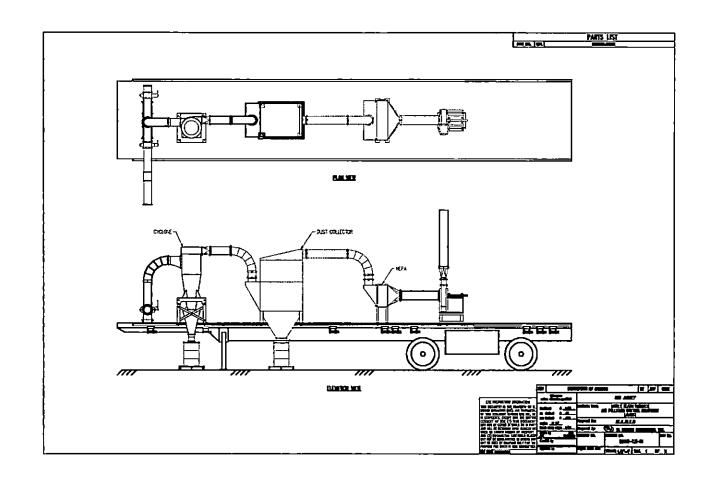


FIGURE 14: THEPAS Drawing



FIGURE 15: THEPAS Photograph

CONCLUSION

The EDE transportable flashing furnace has a large throughput capacity and great flexibility for a variety of operations. It can be entirely self-contained and can be built in 100 days. The TFF provides an economical and practical solution to many of the decontamination and disposal challenges facing the demilitarization, remediation, and UXO and range operations community today.



FIGURE 16. The TFF can be quickly set up at a field site

The fact that no permits may be required for flashing operations makes the TFF truly transportable and opens up a host of applications for this equipment. Range clean-up activities that support widely dispersed or huge tracts of bombing ranges can now collect scrap to convenient staging areas for flashing in each location without being required to centralize collections. Plant decommissioning activities can be conducted on a building bybuilding basis, with the TFF moving between locations, as needed.

The TFF has been demonstrated for a wide variety of applications:

- Demolition of facilities that process explosives and propellants
- Cleanup of test range scrap
- Processing small arms
- Process missile metal parts from recycling facilities
- Processing steel, copper, and aluminum materials

ABOUT EL DORADO ENGINEERING, INC.

El Dorado Engineering is a 33-year old, employee-owned, small business headquartered in Salt Lake City, Utah. As designers and consultants, EDE works on projects worldwide in the specialties of demilitarization of conventional munitions, chemical munitions, and rocket motors; environmental consulting, permitting and restoration; and hazardous/explosive waste treatment and disposal.

In the past several years, EDE has:

- Designed, installed and started rotary kiln Explosive Waste Incinerators (EWI) in Taiwan, Germany, Albania, United Kingdom, Korea, Ukraine, and Belgium.
- Designed and provided Transportable Flashing Furnace (TFF) systems for decontaminating bomb cases, warhead parts, rocket motor bodies, range scrap, etc., and thermal treatment of small arms and initiating devices.
 EDE TFF systems have been deployed at Ravenna, Ohio; Anniston Missile Recycling Center, Alabama; Kaho'olawe Hawaii; Vieques, Puerto Rico; Hill AFB, Utah; Talon, West Virginia; and Letterkenny Army Depot, Pennsylvania.
- Assisted NASA with the air and environmental permits required for siting the space shuttle booster manufacturing and static test firing facilities.
- Provided the air modeling and risk assessment for static firing rocket motors for disposal as part of the U.S. INF Treaty.
- Helped both Eco Logic and CH2M Hill provide separate total solution designs for non-incineration chemical munitions demilitarization for Blue Grass Arsenal using unique chemical process technologies.
- Developed a pressure test relief device for safely opening old ton containers of mustard agent for SAIC/Edgewood.
- Designed, built, and installed a pilot system to remove melt-cast explosives for reuse from bombs and warheads using microwaves for Crane NSWC.
- Assisted the Ralph M. Parsons Company and Russian Federation in the design of a Chemical Munitions Demilitarization System, with a significant amount of work in Moscow.

Exhibit 12

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- Designed and fabricated transportable flashing furnaces for decontamination of explosive contaminated metal parts.
- Used understanding of combustion processes and atmospheric dispersion to consult with NASA on go/no-go launch criteria for Space Shuttle launches.
- Designed and built a contained burn system to dispose of tactical rocket motors.
- Designed and built a contained burn system to dispose of commercial energetic wastes.
- Prepared RCRA and air permits across the U.S., and supported environmental restoration projects across the U.S.
- Assisted Demil International in demonstrating contained detonation systems and procedures for demil and UXO remediation.



American Chemical Society

DR. THOMAS CONNELLY, JR. Executive Director & CEO 1155 SIXTEENTH STREET N.W. WASHINGTON, D.C. 20036 Phone (202) 872-4534

July 13, 2016

The Honorable Ashton Carter United States Secretary of Defense 1000 Defense Pentagon Washington, DC 20301

The Honorable Gina McCarthy Administrator United States Environmental Protection Agency 1200 Pennsylvania Avenue, N.W. Washington, DC 20460

Mr. Secretary and Madam Administrator:

I am writing on behalf American Chemical Society (ACS), a not-for-profit, nationally chartered, professional scientific organization with nearly 157,000 members worldwide. ACS advances the chemistry enterprise, seeks to increase public awareness and appreciation of chemistry and its practitioners, and applies its expertise to public policy matters. Some ACS members have requested that we contact you about the continued open burning of munitions and toxic chemicals in the U.S. and ask why, in 2016, is open burning still being used?

In 2012, an explosion at Camp Minden, a former Louisiana Army Ammunition Plant, shattered windows four miles away in the city of Minden and reportedly sent a 7,000 foot plume of smoke into the air. The explosion reportedly resulted from millions of pounds of chemicals and explosives stored improperly at the Camp Minden. Following the explosion, and several months of negotiation, the U.S. Environmental Protection Agency (EPA) issued an order to have all of the approximately 16 million pounds of munitions and igniters destroyed via open burning.

Our members observe that it was only after citizens' grassroots efforts that the open burning plan was abandoned and a contained burn system using an advanced pollution abatement system was installed at Camp Minden to destroy the munitions and igniters.

Given our nation's evolved and enlightened environmental laws and regulations it seems outdated to have open burning remaining as an acceptable method of disposal for munitions and chemicals. Yet, despite the aforementioned, it appears that open burning remains an option at other sites, such as Radford Army Ammunition Plant in Blacksburg, Virginia; Holston Army Ammunition Plant in Kingsport, Tennessee; Clean Harbors in Colfax, Louisiana; and the China Lake Naval Air Weapons Station in China Lake, California.

Exhibit 14



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

ATLANTA FEDERAL CENTER 61 FORSYTH STREET

ATLANTA, GEORGIA 30303-8960

MAR 2 5 2018

Mr. Bob W instead Safety, Health, Environment and Security BAE SYSTEMS Ordnance Systems Inc. Holston Army Ammunition Plant 4509 West Stone Drive Kingsport, Tennessee 37660

Re: November 17, 2015, Conference Call with BAE Systems and the U.S. Army

Dear Mr. Winstead:

Thank you for taking the time to discuss the open burning of explosives-contaminated demolition debris at the Holston Army Ammunition Plant (HSAAP) with my staff. The open burning of explosives and ordnance as a means of treatment and disposal has drawn the attention of citizen's groups around the country and is now under scrutiny by the Environmental Protection Agency at a national level.

It is my understanding that the dialogue was productive and some general agreements were reached with respect to the open burning of explosives-contaminated demolition debris that may also contain regulated levels of polychlorinated biphenyls (PCBs). These general agreements, as I understand them, are as follows:

- 1.HSAAP agrees that it will permanently cease the open burning of demolition debris, or any other materials, that are suspected of containing PCBs (e.g., pumps, motors, painted piping, painted masonry or wood, caulking, etc.).
- 2. Suspect items that cannot be safely transported for landfill disposal, due to the presence of significant explosive residue, will be characterized for PCBs. If PCBs are present, alternate decontamination methods will be employed, followed by landfill disposal. In the event that alternate methods to burning are not feasible or successful, I-ISAAP will consult with EPA on the proper disposal of the debris.
- The current burn pile will be deconstructed and sorted. Suspect PCB items will be removed for PCB characterization. Disposal in the landfill or another method of disposal will be determined based on the results of the analytical testing.
- 4. If and when a Phase 4 demolition program is implemented, HSAAP will confer with EPA prior to implementation to ensure compliance with the PCB regulations.
- Any waste oil or any other type of oil potentially contaminated with explosive residue will be tested for PCBs prior to disposal.

EPA expects that HSAAP will formally consult with the Tennessee Department of Environment and Conservation and the EPA regarding the appropriate characterization of soil and groundwater tor the products of incomplete combustion of PCBs.

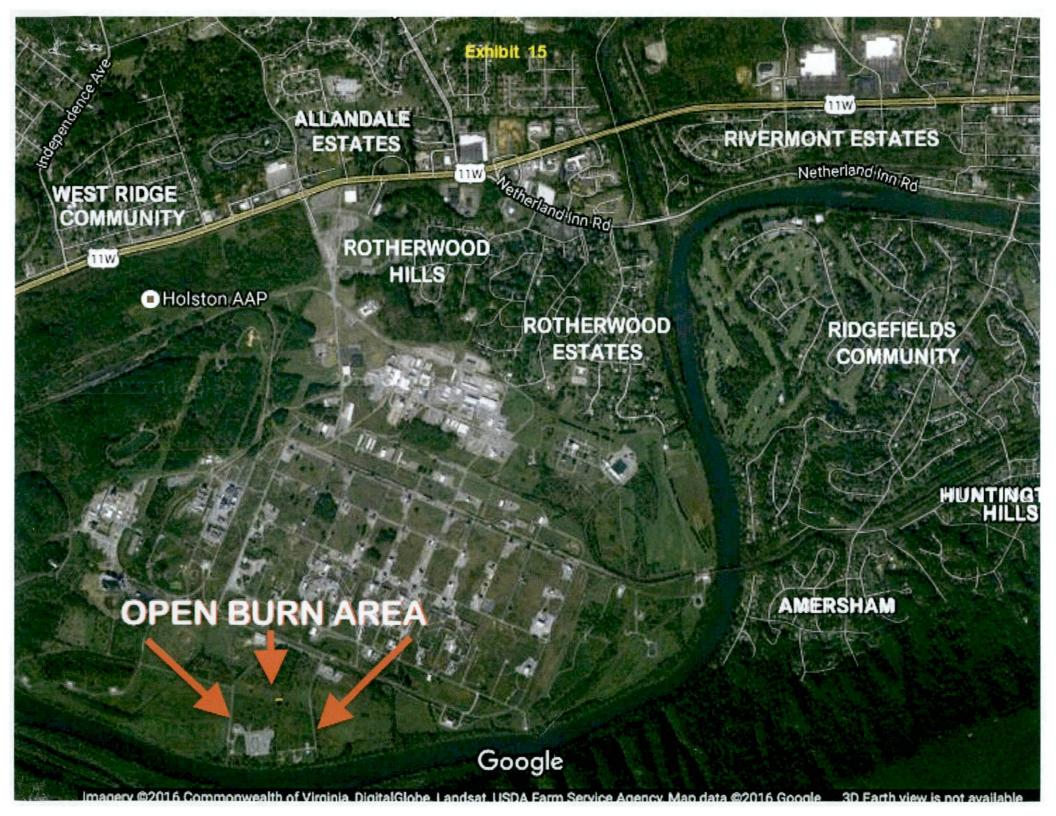
The EPA appreciates your willingness to implement these guidelines at HSAAP in the interest of protection of human health and the environment. If you have any questions or would like to discuss fürther, please contact me at (404) 562-8527 or Ken Feely at (404) 562-8512.

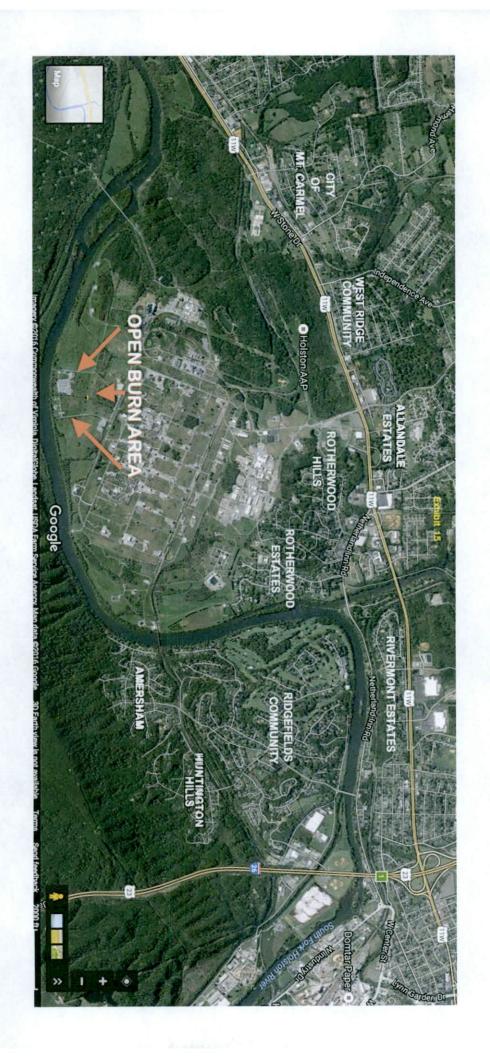
Sincerely,

Jn (). Johnston, Chief

Materials and Waste Management Branch Resource Conservation and Restoration Division

cc: Joseph Kennedy, U.S. Army HSAAP Michael
Vestal, U.S. Army HSAAP
Billy Shelton, BAE Systems HSAAP
Amy Crawford, BAE Systems HSAAP
Paul Bailey, BAE Systems HSAAP
Laura Olah, CSWAB
Mark Toohey
Connie Toohey
William Krispin





Attachment 3

1



Robert Q. Barker 2533 Rivermont Circle Kingsport, TN 37660

August 25, 2016

Mr. Moe Baghernejad State of Tennessee, TDEC/APC William R. Snodgrass-TN Tower, 15th Floor 312 Rosa L. Parks Avenue Nashville, TN 37143

Dear Sir:

I attended the public hearing here in Kingsport, Tennessee on August 18, 2016 and offered a very short statement and indicated that I would submit written statement prior to the deadline on August 29, 2016. A stated in my remarks at that time, I am a private citizen residing here in Kingsport.

As you may recall I did ask whether the permit application being applied for takes into consideration the new amounts of toxics predicted to be destroyed over the next permit period. I will await the response to that inquiry when that information becomes available.

In the interest of time I am submitting several exhibits that cover this topic quite thoroughly and thorough.

A letter to Mr. Ken Feely, Regional PCB Coordination/Cleanups, from R. E. Winstead, Environmental Manager for BAE Systems. In this correspondence Mr. Winstead states that there is no other way to deal with this toxic material.

However in Exhibit 13 we see that Dr. Thomas M. Connelly, Jr. Executive Director and CEO of the American Chemical Society states that there are indeed other more safe ways to deal with this matter.

Exhibit 10 is from Blue Grass Chemical Stockpile Outreach Office. In this information you will find that they do have the ability to destroy toxic material in a safe and efficient manner. I suggest strongly that you contact them to determine why this method could not be implemented at the Holston Army Ammunition Plant in Kingsport, Tennessee.

Please also read Exhibit 12 from El Dorado Engineering Inc. concerning their Transportable Flashing Furnace.

From my vantage point it appears that there are safe ways to dispose of the toxic waste other than by burning. I await your response.

Page 2

Thank you for conducting the public hearing here in Kingsport on the 18th of this month. Hopefully the information now being provided to your department will finally bring toxic burning to an end. It is evident that other safe options are now available.

Sincerely,

Robert Q. Barker

Robot Q. Daha

Exhibit 13



American Chemical Society

DR. THOMAS CONNELLY, JR. Exocutive Director & CEO 1155 SIXTEENTH STREET N.W. WASHINGTON, D.C. 20036 Phone (202) 872-4534

July 13, 2016

The Honorable Ashton Carter United States Secretary of Defense 1000 Defense Pentagon Washington, DC 20301

The Honorable Gina McCarthy Administrator United States Environmental Protection Agency 1200 Pennsylvania Avenue, N.W. Washington, DC 20460

Mr. Secretary and Madam Administrator:

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Given our nation's evolved and enlightened environmental laws and regulations it seems outdated to have open burning remaining as an acceptable method of disposal for munitions and chemicals. Yet, despite the aforementioned, it appears that open burning remains an option at other sites, such as Radford Army Ammunition Plant in Blacksburg, Virginia; Holston Army Ammunition Plant in Kingsport, Tennessee; Clean Harbors in Colfax, Louisiana; and the China Lake Naval Air Weapons Station in China Lake, California.

Radford Army Ammunition Plant in Blacksburg, Virginia; Holston Army Ammunition Plant in Kingsport, Tennessee; Clean Harbors in Colfax, Louisiana; and the China Lake Naval Air Weapons Station in China Lake, California.
Inju 12, 2016
July 13, 2016 Mr. Secretary and Madam Administrator
Page 2
Since the case of Camp Minden demonstrates that technology exists to allow us to abandon open burning, does it make sense to continue to open burn munitions and other toxic wastes?
I would appreciate your looking into this matter and sharing your findings and thoughts. If ACS and its members can be of assistance to your agencies as you consider this we would be pleased to offer whatever assistance we can.
Sincerely,
Dr. Thomas M. Connelly, Jr. Executive Director & CEO American Chemical Society

INFORMATION



Blue Grass Chemical Agent-Destruction Pilot Plant

FOR MORE INFORMATION CONTACT:

Blue Grass
Chemical Stockpile
Outreach Office:
1000 Commercial
Drive, Suite 2
Richmond, KY 40475'
(859) 626-8944
bgoutreach@iem.com

Blue Grass Army Depot Public Affairs Office (859) 779-6941

Blue Grass Chemical, Activity Public Affairs Office (859) 7.79-6897

Supercritical Water Oxidation

The <u>Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)</u> will safely destroy a chemical weapons stockpile that comprises more than 500 tons of chemical agent in weapons stored at the <u>Blue Grass Army Depot</u>. The plant will eliminate these chemical weapons using a two-step process.

Step one consists of a process that will neutralize the chemical agent. The munitions will be disassembled to separate the agent from the energetics, which will then be mixed separately with either a caustic solution or water to destroy the chemical agent and energetics before being temporarily stored for later treatment. The resulting byproducts are known as hydrolysate.

Step two involves a secondary process called supercritical water oxidation (SCWO), which will be used for final treatment of the hydrolysate at BGCAPP. This fact sheet explains how SCWO works and provides background information on how it has been tested in preparation for use at BGCAPP.

The Science of SCWO

The SCWO process will blend water, fuel, air and hydrolysate together in a specialized vessel at temperatures and pressure conditions above the critical point of water.

A supercritical fluid is defined as a substance that is above a specific temperature and pressure, known as its critical point.

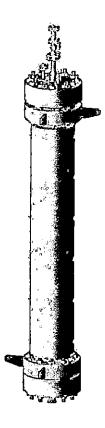
The critical point is unique for every substance. For water, the critical temperature and pressure are 705 degrees Fahrenheit and 3204 psi, respectively. Above the critical point, the liquid and gaseous phases become indistinguishable – existing neither as a liquid nor a gas, but as a homogeneous dense fluid. Water above its critical point is referred to as supercritical water, and may be thought of as very dense steam.

Supercritical water has unique properties and is much different from water at room temperature. Salts and other polar compounds that are normally soluble will drop out of solution at

supercritical conditions. On the other hand, nonpolar organic compounds — materials that normally form a separate phase when mixed with liquid water — become highly soluble in supercritical water and are quickly converted to form carbon dioxide and more water in the presence of oxygen (also fully soluble).

For instance, imagine taking a glass of salt water with an oil layer on top and increasing the temperature and pressure above the critical point of water to supercritical conditions. The salt would separate from the water, and the oil would fully dissolve, leaving you with a glass containing a dense oil-water mixture at the top and salt at the bottom. If oxygen were added, the oil would rapidly and cleanly oxidize to form carbon dioxide and water. In a similar manner, the organics in the hydrolysate channel and oxygen mix together in the SCWO vessel and react to break down the hydrolysate, creating carbon dioxide, water and salt products.

After concentration, this brine solution will be shipped off site to a licensed treatment, storage and disposal facility. For conservation purposes, about 70 percent of water used in the SCWO process will be recycled back into the BGCAPP facility.



This computer graphic illustrates the SCWO reactor vessel, which will combine water, fuel, air and hydrolysate. The hydrolysate is oxidized to carbon dioxide, water and salts.



A Partnership for Safe. Chemical Weapons Destruction



Supercritical Water Oxidation (continued)

Testing Ensures Performance

SCWO is a tested and proven technology. There are currently six full-scale SCWO plants operating worldwide, including one at the Defense Ammunition Center at the McAlester Army Ammunition Plant in Oklahoma. Others are located in France, Japan, Korea and the United Kingdom. However, BGCAPP will be the first industrial-scale facility to combine the two technologies of neutralization and SCWO. As a result, the Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA), which is responsible for the destruction of the Kentucky chemical weapons stockpile, has conducted more than 7,000 hours of testing on the SCWO process. An additional 12-month full-scale testing period was completed at the SCWO fabrication facility prior to sending the units to the BGCAPP site. As with all BGCAPP systems, once the SCWO units are completely installed at the BGCAPP site, further testing will be completed until operational conditions are satisfactorily established, and the BGCAPP team is confident that SCWO will be a safe and efficient secondary treatment process.

The National Academies of Sciences, Engineering and Medicine (NASEM), formerly the National Research Council, evaluated the SCWO Intermediate Design and Technical Risk Reduction Program in July 2006. NASEM recommended additional testing using a full-scale reactor at full-scale conditions. Teams from PEO ACWA and Bechtel Parsons Blue Grass addressed NASEM's recommendations by completing the full-scale testing period referenced above.

In addition, the Army Research Office convened an independent panel of SCWO process experts and evaluated PEO ACWA and Bechtel Parsons Blue Grass' intended path forward in September 2006. The panel evaluated the Technical Risk Reduction Program to determine if adequate measures were in place to address the risks identified by NASEM. The panel concluded that the testing to be conducted was adequate.

The use of neutralization followed by SCWO has been independently reviewed and endorsed by the governor-appointed Kentucky Chemical Demilitarization Citizens' Advisory Commission.



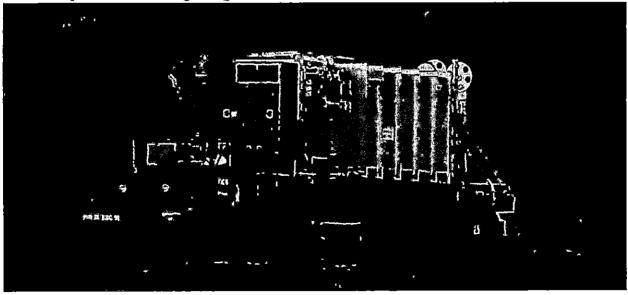
EL DORADO ENGINEERING INC.

2964 W 4700 S, Suite 109 • Salt Lake City, UT 84129 • Tel: (801) 966-8288 • Fax: (801) 966-8499

APPLICATIONS FOR THE EL DORADO ENGINEERING TRANSPORTABLE FLASHING FURNACE (TFF)

INTRODUCTION

El Dorado Engineering, Inc. (EDE) has designed and fielded Transportable Flashing Furnace (TFF) systems for treating potentially explosive contaminated materials, small arms ammunition, and other energetic materials. Owing to its superior performance, true transportability, robust design, ease of use, high throughput capability, and inherent safety, this technology has proven to be very versatile with successful projects at numerous sites. The TFF technology was originally conceived by EDE to be used for thermal decontamination of range debris during remote range cleanup operations so scrap metal could be certified as 5X and sold for recycling. One of the earliest EDE TFF units was successfully used to treat over eight million pounds of explosive contaminated scrap metal in support of the reclamation project in Kaho'olawe, Hawaii. EDE TFF units have been used widely at other remote range sites to flash potentially contaminated scrap metal. This technology has also proven useful for a wide variety of other applications. Some example projects include: remediation operations in treating explosive contaminated equipment in the demolition of Ravenna Army Ammunition Plant; small arms ammunition disposal at Eglin Air Force Base and Hill Air Force Base; thermal treatment of live fuze components for cleanup at Talon W.V. site; flashing explosive contaminated metal components from the missile recycling facility at Anniston, Alabama; and decontamination of commercial waste components containing energetic materials.



The large workloads, variety of applications, and a recently completed ESTCP contract have provided opportunity to study the operations in more detail and optimize design and operations. Based on these successful TFF applications, this technology has been well demonstrated for

processing/explosive contaminated metal debris so that it can be sold directly as scrap metal as well as processing small live items.

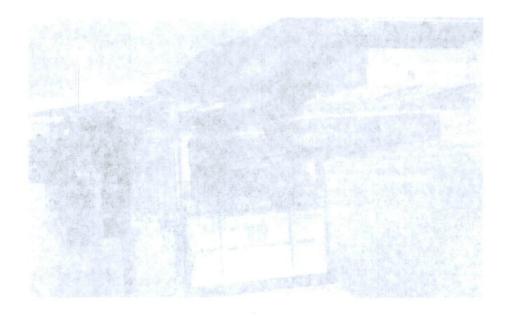
BACKGROUND

There are often large quantities of inert materials associated with Unexploded Ordnance (UXO) and explosive remediation activities that may be potentially contaminated with explosives. Large military test ranges also produce large quantities of potentially contaminated metals. Decommissioning of ammunition plants, load lines and energetic material processing facilities also results in large quantities of contaminated inert materials (pipes, valves, equipment, etc). Physical cleaning of these materials can produce a 3X level of decontamination, but blind areas, joint, cracks, voids, etc. can harbor residual energetic materials that visual inspections cannot find, and leave some doubt about the condition of the materials. Direct disposal of this material represents a problem as explosive mishaps and casualties have resulted from handling this material. Typically, 3X materials are closely controlled and prevented from entering the public material supply chain to avoid causing any fire or explosive incidents and resulting liability. A solution to this problem is that 3X materials can be thermally treated to be decontaminated. It is then classified 5X and can be freely released to industry without restriction. The Army's TB 700-4 requires that all 3X material be decontaminated to 5X before release to the general public. Although the Navy and Air Force do not have a similar regulation, both agencies recognize the seriousness of this problem. As recently as May 2003 the Navy Facilities Command noted two recent explosive mishaps and prescribed contract rewording. Also DRMS put a moratorium on sale of range residue according to the 2003 Summer Navy Weapons and Explosive Safety article.

The problem is that, up to this point, thermal decontamination ovens have been fixed installations, and the cost of transporting contaminated debris has been prohibitive. EDE has solved this problem by adapting the contaminated waste processing technology employed at many military installations to a standard 48- foot trailer for transportability. Now flashing furnace technology can be deployed to the field for easy, high volume, repeatable, certifiable 5X decontamination.

LEGACY TECHNOLOGY

In response to increasingly stringent environmental regulations in the latter 70's and early 80's, the Army developed a small, simple flashing furnace (see Figure 1). This stationary unit employed a refractory car bottom that moved in and out of the furnace to facilitate loading. Many depots and load lines had 3X explosive contaminated scrap. A typical application might include 750 lb. bomb bodies from wash out or melt out operations. In order to sell the metal, the bomb bodies had to first be decontaminated to 5X level. As can be seen in Figure 1, the flashing furnace was successfully applied to this application.



hearth (seen processing 750 to, hands shells)

contaminated combustible materials be added to the flashing turnace feed stream. Many of these materials be added to the flashing turnace feed stream. Many of these materials be a all day long in the open generating thick, black smoke. These materials often had the reburge flas they burn so poorly. While working for the Army EDE personnel were assigned to produly the flashing flurace to process combustible explosive contaminated wastes. Modifications consisted of adding combustion are an unfired afterburner, and a complete pollution control system. A larger version of the furnace was also designed to provide greater throughput and to decontaminate 20° sections of pipe. This system became known as the Contaminated Waste Precess (10° MP).

THE EDETIRANSPORTABLE PLASHING PURCHASIACE LIFEO

waste humany. All of the Army installations were nationary. Efth decided that by climinating the admitional combinatible admitional combination could be admitted to the flacing furnace technology could be made transportable, and it could be deployed to ited locations to service small or temporary needs that a outle to find it a full, fixed installation.

EDE designed a FiT to meet the following specifications (see Figures 2, 3, 4)

- Transport delity. Totally contained on a 48 long traiter, transportable over highway. (as seen before to I mark 2)
- Noneral Lemma dimension S high x T wide x 17 long
- Bottor: tolls out for easy loading of large, heavy, or awkward batches
- Cycle time is 45 to 90 minutes, depending on load size
- Cerardic wood insulation to allow rapid heat up and cool down
- Cooling an for rapid cool down
- Untired afferburner to annumize emissions
- Main controls on trailer, pendant mounted controls for remote operation for salety

- Burners: Oil-fired dual burners with propane pilots; 6MMBTU/hr capacity
- Standard operating temperature: 1000°F
- Temperature recording to verify each load temperature
- Optional electric generator and fuel skid available
- Field set up and take down in approximately one day
- Up to 10,000 lbs. can be loaded in a single batch typical operation is 2 ½ tons per hour

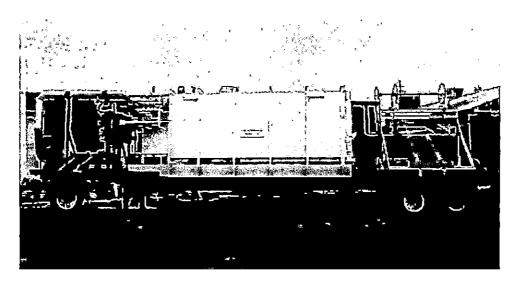


FIGURE 2: All components are stored on a single trailer for shipping

Exhibit 11

Dear Mr. Toohey.

Thank you for contacting us again. As I understand from the information you provided, HAAP currently uses open burning for disposal of residual explosives, and potential explosive contaminated materials (filters, washcloths, bags, wood, piping, etc.). El Dorado Engineering specializes in systems to safely dispose of these types of materials.

We have both "off-the-shelf" alternatives and custom designed alternatives according to our clients requirements. We would need to receive some additional detailed information to determine which alternative(s) would be the best fit for the HAAP application. Alternatives shown on our website which we would initially consider to likely be feasible include:

- Contaminated waste processor (designed to treat large quantities of explosive contaminated filters, bags, pallets, etc. and small quantities of residual explosives) and
- Contained burn systems (designed to burn large quantities of residual explosive materials and small quantities of contaminated trash).

Depending on the types and quantities of workload a single system can likely be fielded to handle the majority of waste materials currently being open burned. Typically, we discuss with our prospective client the detailed composition and configuration of their materials, especially the energetic compounds involved, as well as their hourly or daily throughput, and specific handling requirements in order to provide the best technical and economical solution. Often when a client has a wide variety of waste item types we can first perform a small consulting analysis to define their workload and determine the optimal system type and size.

We would be happy to enter into a dialogue with the appropriate parties to discuss this further. Let me know your thoughts on how best to proceed.

By coincidence, I just returned yesterday from the stack testing at our facility in Minden. The stack had no smoke (zero visible emissions) and the data I witnessed showed excellent results for elimination of both fine particulate and potential gaseous pollutants, the formal report will be out in a few weeks.

Best Regards,

Bob Hayes President EL DORADO ENGINEERING Phone: (801) 966-8288

From: Mark Toohey [mailto:markhtoohey@gmail.com]

Standard operating temperature, 1000 F.

Temperature recording to yearly each load temperature.

Optional electric generator and fuel skid available.

Field set up and take down in approximately Ine day.

Up to 10,000 lbs. can be loaded in a single batch – typical operation is 2 to tons per hour

Exhibit 11

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Best Regards,

Bob Hayes President EL DORADO ENGINEERING Phone: (801) 966-8288

From: Mark Toohey [mailto:markhtoohey@qmail.com]

Attachment 4

WRITTEN COMMENT SHEET for PUBLIC HEARING

August 18, 2016

Major Source Title V Permit Renewals # 568191 and # 568188 for Holston Army Ammunition Plants ID # 82-0018 and 37-0028 East Tennessee State University Allandale Campus 1501 University Boulevard, Kingsport, TN

This form can be used to make written comments in lieu of or in addition to oral comments while at the Public Hearing. Written comments can be submitted during the Public Hearing to any TDEC staff member, emailed or mail delivered to the Division of Air Pollution Control at the below address <u>no later than midnight CDT August 29, 2016</u>:

Phone: 615-532-0594 Fax: 615-532-0614

Email:

moe.baghernejad@tn.gov
State of Tennessee. TDEC/APC

William R. Snodgrass - TN Tower, 15th Floor

312 Rosa L. Parks Avenue

Nashville, TN 37143

PLEASE PRINT BELOW:

Name: Jenny Toohey	
Representing: <u>Private Citizen</u>	
Mailing Address:	
E-Mail Address: Jenna toohey @ 1	notmail.com
Comments: From my understanding	, there are alternatives to
open burning, however BAE	
use these alternatives. Renewir	
for them. This is unacceptab	
Signature:	Date: 8/18/16
4 ()	

Attachment 5



a national campaign to end open air burning, detonation and incineration of hazardous munitions wastes

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

August 17, 2016

SUBMITTED BY ELECTRONIC MAIL

RE: Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Walker,

By this letter, the Cease Fire Campaign objects to the continued open air burning and detonation of explosives and related munitions wastes at the Holston Army Ammunition Plant based on the availability of safer advanced alternatives, the excessive risk to human health and the environment, and noncompliance with federal law requiring the implementation of available safer advanced treatment methods.

By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Military personnel are often the most exposed to these toxic pollutants, along with nearby communities. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants.

In the past 25 years, alternatives to the incineration of hazardous waste have emerged due to the work of communities, EPA, and the Department of Defense (DOD). These technologies are being used by the DOD to destroy energetics and chemical warfare agents and could be readily applied to conventional munitions and other types of hazardous waste.

Examples of these technologies include Gas Phase Chemical Reduction which uses hydrogen and heat to break down toxic chemicals into their basic components. Because hydrogen is used for the reduction reaction and no oxygen is present, no harmful chlorinated byproducts can be formed. This technology was used to destroy PCBs and obsolete pesticides in Australia. It was specifically developed for the Assembled Chemicals Weapons Destruction program.

Supercritical Water Oxidation uses the unique forces of supercritical fluids to breakdown the chemical bonds which form munitions, propellants, and energetics. Supercritical Water Oxidation uses super pressurized, heated water to tear apart the chemical bonds in toxic organic compounds, breaking them down into basic components such as water, carbon dioxide, and nitrogen gas. The lower temperature

(compared to combustion) and the high pressure of the water keep harmful byproducts from being formed.

There are several types of detonation chambers that can be used to safely destroy waste munitions. These detonation chambers are much safer than open burning or incineration because they hold and test the gases to ensure all the toxic components have been destroyed before releasing them. One kind of detonation chamber, the DAVINCH chamber, detonates explosives in a vacuum. Without the presence of oxygen, harmful products of incomplete combustion cannot be formed.

Moreover, over the past 15 years the Department of Defense Explosives Safety Board has certified a number of technologies as safe for the destruction of hazardous wastes which are explosive. Those technologies are now in use by the Department of Defense and the private sector for the destruction of explosive hazardous waste.

Not only do safer advanced technologies exist, their implementation is required by federal law. The operating language on open burning/open detonation of hazardous wastes which are waste explosives is contained in Title 40, Section 266.382. "Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of **through other modes of treatment**." (Emphasis added.)

The CEASE FIRE Campaign is a national coalition of more than 50 environmental, labor, veterans service and social justice organizations. Our campaign seeks to protect human health and the environment by calling for the immediate implementation of safer alternatives to open air burning, detonation and non-closed loop incineration/combustion of military munitions. These alternatives must incentivize waste prevention and recycling; prevent, to the greatest possible extent, the release of toxic emissions and pollutants; and advance the principles of environmental justice by assuring that all people enjoy the same degree of protection and access to the decision-making process.

Sincerely,

Laura Olah

National Coordinator, CEASE FIRE Campaign

Executive Director, Citizens for Safe Water Around Badger (CSWAB)

E12629 Weigand's Bay S, Merrimac, WI 53561

(608)643-3124

info@cswab.org

http://cswab.org/resources/cease-fire-campaign

http://www.facebook.com/ceasefirecampaign/

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Sincerely,

Laura Olah

National Coordinator, CEASE FIRE Campaign

Executive Director, Citizens for Safe Water Around Badger (CSWAB)

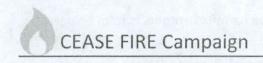
E12629 Weigand's Bay S, Merrimac, WI 53561

(608)643-3124

info@cswab.org

http://cswab.org/resources/cease-fire-campaign

http://www.facebook.com/ceasefirecampaign/



a national campaign to end open air burning, detonation and incineration of hazardous munitions wastes

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

August 17, 2016

SUBMITTED BY ELECTRONIC MAIL

RE: Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Walker,

By this letter, the Cease Fire Campaign objects to the continued open air burning and detonation of explosives and related munitions wastes at the Holston Army Ammunition Plant based on the availability of safer advanced alternatives, the excessive risk to human health and the environment, and noncompliance with federal law requiring the implementation of available safer advanced treatment methods.

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Supercritical Water Oxidation uses the unique forces of supercritical fluids to breakdown the chemical bonds which form munitions, propellants, and energetics. Supercritical Water Oxidation uses super pressurized, heated water to tear apart the chemical bonds in toxic organic compounds, breaking them down into basic components such as water, carbon dioxide, and nitrogen gas. The lower temperature

Attachment 6

August 15, 2016

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue 15th Floor
Nashville, Tennessee 37243

Subject: Comments on Draft Operating Permits 56819 &568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to the renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. Open burning and detonation result in the uncontrolled release of toxic pollutants to our environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Our community has felt the adverse effects of these toxic pollutants for years. Please protect our health by requiring the Army to use other available alternatives to open burning in our community of Kingsport, TN. Thank you for your time and consideration.

Mirce dia

John A. Eanes

794 Cooks Valley R.

Kingsport, TN. 37664

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

AUG 30 2016 PM1:20

82.0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

Corli

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Ms. Michelle Walker Owenby, Director Division of Air Pollution Control Tennessee Department of Environment & Conservation William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, Tennessee 37243 michelle.b.walker@tn.gov

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

Robbie C. Lewis

235 Fleming Rd. Gate City, VA 24251

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

50 Fleetward Dr Kingsport TN 37660 Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

Carol Stout 1509 Lamont Street Kingsport, TN 37664 Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 - 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

allison Tooley

Jill Cookenour 1773 Cooks Valley Road

Kingsport, TN 37664

August 16, 2016

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15 th Floor
Nashville, Tennessee 37243

82-0018 37-0028

Re: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby:

The purpose of this correspondence is to voice my opposition to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. As you probably are aware, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Nationwide, communities and military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tennessee.

Thank you for your time and consideration.

Sincerely,

Jill Cookenour

> 37-0028 82-0018

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tn. Thank you for your time and consideration.

Sincerely,

JENNA TOOHEY

2529 Rivermont Cir.
Kingsport TN, 37660

John S. McLellan, III

P. O. Box 387 Kingsport, TN 37662

August 16, 2016

Ms. Michelle Walker Owenby, Director Division of Air Pollution Control Tennessee Department of Environment & Conservation William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15 th Floor Nashville, Tennessee 37243

22-0018 37-0028

Re: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby:

Please be advised that I am opposed to renewal of the portions of Holston Army Ammunition Plant's Air Pollution permits which continue to allow the open burning of explosives and explosive contaminated waste. By definition, open burning and detonation result in the uncontrolled release of toxic pollutants to the environment. These toxic emissions endanger public health by contaminating air, groundwater and soils near these operations. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants. Please protect our health by requiring the army to use other available alternatives to open burning in Kingsport, Tennessee.

Thank you for your time and consideration.

Yours truly,

John S. McLellan, III

AUG 22 2016 PM12:03

Ms. Michelle Walker Owenby, Director **Division of Air Pollution Control** Tennessee Department of Environment & Conservation William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, Tennessee 37243 michelle.b.walker@tn.gov

> 37-0028 81-0018

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

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Sincerely,

Jason Blevins Jason Blevins 415 Robin Ct.

Kingsport TNg 37664

12

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

Enclosed please find comments from 11 separate individuals which are submitted as part of the public comment record in the above referenced draft permits

Best regards,

Mark Toohey

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

Dear Ms. Owenby;

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Sincerely,

iffCity, TN. 37618

AUG 22 2016 PM12:04

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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Sincerely,

Kella Stagleman 1528 Monterey Que. Kings port, M31444

Teresa Booker 2408 Muddy Cruk Rd Blownfulls Tr. 37617

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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82-0018 37-0028

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Sincerely,

Cassidy Shaver 2013 Milye St. Kingsport, TN 37664

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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Sincerely,

Marla Hammonds 1096 Sourmash Drive Hings port, TN 37660

AUG 22 2016 PM12:04

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 37-0028

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Sincerely,

Milinda Lashky 304 Chesterfield Dr Kingsport Tn 37663

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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Sincerely,

andrea Harrell

AUG 22 2016 PH12:04

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 87-0028

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Sincerely,

Emily Hutchins

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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Sincerely

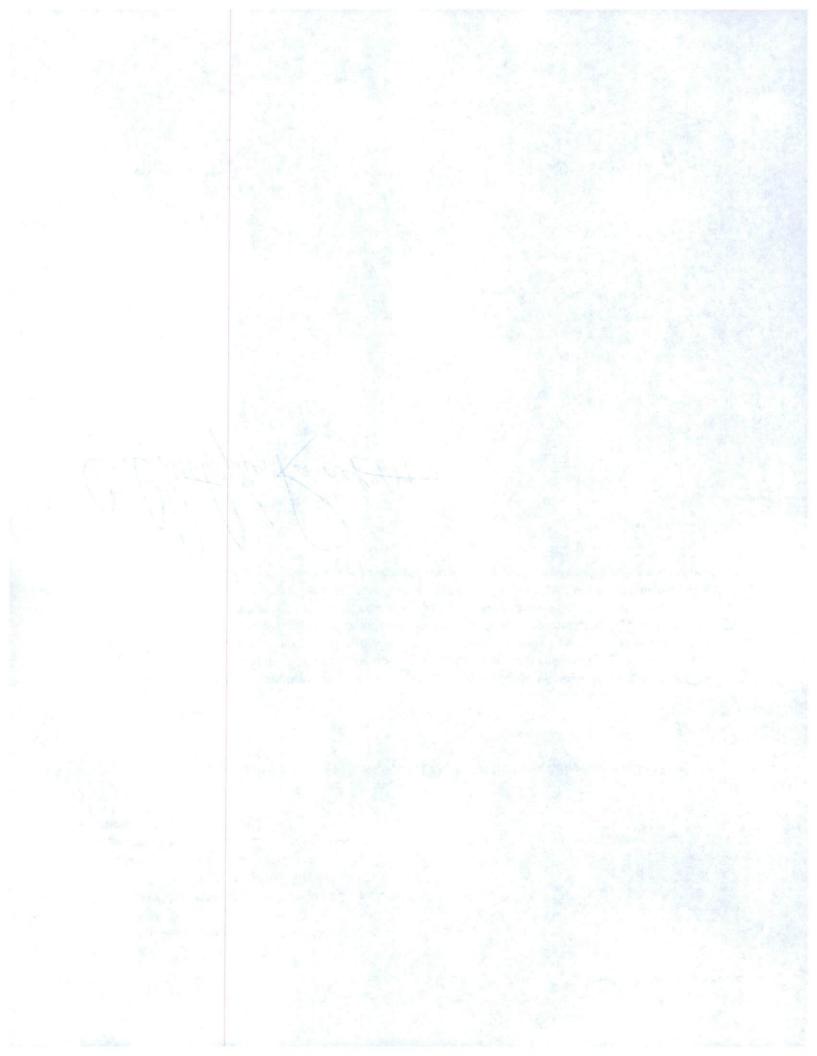
Buttany D. Church 1213 Wateree St. Kingsport, TN 37440

82-0018 37-0028

Subject: Comments on Draft Operating Permits 568191 & 568188 (Holston Army Ammunition Plant)

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AUG 22 2016 PM12:05

Ms. Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of Environment & Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor
Nashville, Tennessee 37243
michelle.b.walker@tn.gov

82-0018 37-0028

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Sincerely,

Dalls 2316 Strant DR KINGSport, TN 376G9

Attachment 7

From:

joshwinkler77@gmail.com

Sent:

Monday, August 29, 2016 6:38 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

Sincerely, Joshua R. Winkler

From:

Lolobrookshire@charter.net

Sent:

Monday, August 29, 2016 6:45 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

renee@tcwn.org

Sent:

Friday, August 26, 2016 7:40 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

From:

jennatoohey@hotmail.com

Sent:

Friday, August 26, 2016 8:23 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, Jenna Toohey

From: ssppacey@hotmail.com

Sent: Friday, August 26, 2016 8:32 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, Jason Blevins

From:

tennedean@mindspring.com

Sent:

Thursday, August 25, 2016 12:23 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

jarmbru@aol.com

Sent:

Thursday, August 25, 2016 12:37 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

juliapcohen@gmail.com

Sent:

Thursday, August 25, 2016 12:38 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

jamescampb69@yahoo.com

Sent:

Thursday, August 25, 2016 12:42 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, James C Campbell

From:

jsouther@chartertn.net

Sent:

Saturday, August 27, 2016 3:46 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

wildbeautynatives@icloud.com

Sent:

Saturday, August 27, 2016 2:41 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: luncefordrose@aol.com

Sent: Saturday, August 27, 2016 1:16 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in . Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

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From:

lizhoyle@yahoo.com

Sent:

Monday, August 29, 2016 6:36 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, LB

From: joshwinkler77@gmail.com

Sent: Monday, August 29, 2016 6:38 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, Joshua R. Winkler

From:

Lolobrookshire@charter.net

Sent:

Monday, August 29, 2016 6:45 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

smbanbury@gmail.com

Sent:

Friday, August 26, 2016 1:20 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

Dany@Kunz-Fam.com

Sent:

Friday, August 26, 2016 1:37 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

rorlowske@gmail.com

Sent:

Friday, August 26, 2016 1:40 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

cindy.whitt@comcast.net

Sent:

Friday, August 26, 2016 2:06 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: wauhatchie@gmail.com

Sent: Friday, August 26, 2016 3:37 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

caitlincraig1016@gmail.com

Sent:

Friday, August 26, 2016 3:44 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: markhtoohey@gmail.com

Sent: Friday, August 26, 2016 5:32 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: conniesuzanne2@yahoo.com

Sent: Friday, August 26, 2016 5:42 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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Sincerely, Connie Toohey

From:

chriscat2014@hotmail.com

Sent:

Friday, August 26, 2016 5:51 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

random_male_man@yahoo.com

Sent:

Friday, August 26, 2016 6:01 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, reg mitchell

From:

mhwhetsell@yahoo.com

Sent:

Friday, August 26, 2016 6:14 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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Sincerely, Mandy Whetsell

From:

jmswagerty.southcentralkpt@gmail.com

Sent:

Friday, August 26, 2016 6:59 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

· I am a Tennessean concerned about children's health and air pollution.

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From:

GLa4797@embargmail.com

Sent:

Friday, August 26, 2016 6:59 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

psychomommy1@yahoo.com

Sent:

Friday, August 26, 2016 8:46 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

BOBB@altcs.us

Sent:

Friday, August 26, 2016 10:11 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: choochiepie1922@yahoo.com
Sent: Friday, August 26, 2016 11:01 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

From:

kaykay@gmail.com

Sent:

Friday, August 26, 2016 1:01 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

mikeandmary123@att.net

Sent:

Friday, August 26, 2016 2:13 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, Mary

From:

donwder@yahoo.com

Sent:

Friday, August 26, 2016 2:49 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: sparrowhawk@nctc.com

Sent: Friday, August 26, 2016 3:08 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

lesley.ochoa1@gmail.com

Sent:

Friday, August 26, 2016 7:09 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

bkornrich@gmail.com

Sent:

Friday, August 26, 2016 7:43 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

zcastillo_3@yahoo.com

Sent:

Sunday, August 28, 2016 12:05 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

dreambbw45@aol.com

Sent:

Sunday, August 28, 2016 5:37 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

pickjam65@yahoo.com

Sent:

Sunday, August 28, 2016 10:21 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

sanfordsmith@eplus.net

Sent:

Sunday, August 28, 2016 2:04 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

anniesaddress@vahoo.com

Sent:

Sunday, August 28, 2016 4:24 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

luncefordrose@aoi.com

Sent:

Saturday, August 27, 2016 1:16 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

wildbeautynatives@icloud.com

Sent:

Saturday, August 27, 2016 2:41 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

jsouther@chartertn.net

Sent:

Saturday, August 27, 2016 3:46 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

janice56@centurytel.net

Sent:

Saturday, August 27, 2016 10:06 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

erwintarkington@yahoo.com

Sent:

Saturday, August 27, 2016 10:46 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

oliviela@gmail.com

Sent:

Saturday, August 27, 2016 1:43 PM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

po_eanes@yahoo.com

Sent:

Saturday, August 27, 2016 2:05 PM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

sandykirk_37343@yahoo.com

Sent:

Saturday, August 27, 2016 4:26 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

thomas.g22@icloud.com

Sent:

Thursday, August 25, 2016 9:07 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

mbrant902@comcast.net

Sent:

Thursday, August 25, 2016 9:08 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

e.pope@att.net

Sent:

Thursday, August 25, 2016 9:10 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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PLEASE.

Sincerely, Elsie Pope

From:

idsam4549@aol.com

Sent:

Thursday, August 25, 2016 9:11 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: clara.collins@vanderbilt.edu

Sent: Thursday, August 25, 2016 9:11 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, Clara Collins

From: jpierce0329@comcast.net

Sent: Thursday, August 25, 2016 9:12 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: lindsaymeghankopp@gmail.com
Sent: Thursday, August 25, 2016 9:13 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

southernbelle4244@yahoo.com

Sent:

Thursday, August 25, 2016 9:16 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

carolott1@verizon.net

Sent:

Thursday, August 25, 2016 9:18 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

Sincerely, Carol Ott

From:

mf57902@bellsouth.net

Sent:

Thursday, August 25, 2016 9:18 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

bob.boland@att.net

Sent:

Thursday, August 25, 2016 9:23 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

pmlcsw@comcast.net

Sent:

Thursday, August 25, 2016 9:24 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, Paul Morris

From:

bonnie.camp@hilton.com

Sent:

Thursday, August 25, 2016 9:25 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: lenorerr@comcast.net

Sent: Thursday, August 25, 2016 9:27 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

paul@mssoftware.com

Sent:

Thursday, August 25, 2016 9:29 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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Sincerely, Paul B. Van Geel

From:

einz@dtccom.net

Sent:

Thursday, August 25, 2016 9:29 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: sharoncookie57@gmail.com

Sent: Thursday, August 25, 2016 9:36 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

linde.brocato@gmail.com

Sent:

Thursday, August 25, 2016 9:39 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

davez385@frontier.com

Sent:

Thursday, August 25, 2016 9:39 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

rll54@yahoo.com

Sent:

Thursday, August 25, 2016 9:42 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

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From: johnselser@att.net

Sent: Thursday, August 25, 2016 9:43 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

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From:

jamercer@bellsouth.net

Sent:

Thursday, August 25, 2016 9:45 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Surely there are better, safer, healthier ways to dispose of these materials!

Open burning practices may have been considered the best available method for wasted ammunition in the old days. But thankfully, today there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

Please prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

From:

jghenderson@bellsouth.net

Sent:

Thursday, August 25, 2016 9:45 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

tmi_darktower@yahoo.com

Sent:

Thursday, August 25, 2016 9:46 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: debi.darnell@yahoo.com

Sent: Thursday, August 25, 2016 9:48 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

cdetmer@comcast.net

Sent:

Thursday, August 25, 2016 9:51 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

paromovn@goldmail.etsu.edu

Sent:

Thursday, August 25, 2016 9:54 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

rareairmusic@yahoo.com

Sent:

Thursday, August 25, 2016 9:54 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From: pappasmurff@bellsouth.net

Sent: Thursday, August 25, 2016 9:58 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

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From:

markarmetz@gmail.com

Sent:

Thursday, August 25, 2016 9:58 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

kathleen.eamd@gmail.com

Sent:

Thursday, August 25, 2016 9:58 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

jackimasar@gmail.com

Sent:

Thursday, August 25, 2016 9:59 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

isryder@btes.tv

Sent:

Thursday, August 25, 2016 10:04 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

grib32578@gmail.com

Sent:

Thursday, August 25, 2016 10:08 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: i.h.hamilton@vanderbilt.edu

Sent: Thursday, August 25, 2016 10:09 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: cfwedding@netscape.net

Sent: Thursday, August 25, 2016 10:24 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

michaelandmarie0508@yahoo.com

Sent:

Thursday, August 25, 2016 10:25 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

Open burning practices were once considered the best available method for wasted ammunition. But thankfully, there are safer alternatives available, such as Supercritical Water Oxidation, Gas Phase Chemical Reduction, and closed loop incineration with advanced pollution control, that provide better protection of human health and our natural resources.

As a parent, I do everything I can to protect my child. And when there is new technology available to better protect their health, I adopt it.

I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

From:

beccacansler@yahoo.com

Sent:

Thursday, August 25, 2016 10:27 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

black-rose@mindspring.com

Sent: Thursday, August 25, 2016 10:39 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: tina.m.tine@gmail.com

Sent: Thursday, August 25, 2016 10:49 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, Tina Tine'

From:

p.bier1948@gmail.com

Sent:

Thursday, August 25, 2016 10:50 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: dishmanx2@aol.com

Sent: Thursday, August 25, 2016 10:50 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

jimsteitz@mac.com

Sent:

Thursday, August 25, 2016 10:55 AM

To:

Moe Baghernejad

Subject:

No More Open Burning as Munitions Disposal

Dear Mr. Moe Baghernejad,

Decades ago, burning these substances and venting the fumes into our atmosphere was considered a reasonable means of disposal. Today, this is no longer a civilized use of our atmosphere, and of the lungs of those humans living nearby. Please upgrade your disposal process to something that keeps the resulting waste bound and controlled.

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From:

ameilharris@att.net

Sent:

Thursday, August 25, 2016 10:55 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

cmdare38401@yahoo.com

Sent:

Thursday, August 25, 2016 10:57 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

alannahtomich@gmail.com

Sent:

Thursday, August 25, 2016 11:05 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

mtflower@bellsouth.net

Sent:

Thursday, August 25, 2016 11:05 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

dustin_jackson@comcast.net

Sent:

Thursday, August 25, 2016 11:10 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely, Dustin

From:

jherron64@bellsouth.net

Sent:

Thursday, August 25, 2016 11:14 AM

To:

Moe Bagherneiad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

rijptreece@att.net

Sent:

Thursday, August 25, 2016 11:21 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

cris.bartolomeo@yahoo.com

Sent:

Thursday, August 25, 2016 11:24 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

kerm.east@gmail.com

Sent:

Thursday, August 25, 2016 11:25 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

robbearls@gmail.com

Sent:

Thursday, August 25, 2016 11:28 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: angela.padgett@cumulus.com

Sent: Thursday, August 25, 2016 11:32 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

jtstewart@juanica.com

Sent:

Thursday, August 25, 2016 11:33 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

cathynelsondavis@gmail.com

Sent:

Thursday, August 25, 2016 11:41 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

Eventually we all breath the same air. As a grandmother I hope all grandchildren will have clean air as they grow up.

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: almiller@discexchange.com

Sent: Thursday, August 25, 2016 11:49 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

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From:

i mattes2001@yahoo.com

Sent:

Thursday, August 25, 2016 11:52 AM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: hairybeardeddad@yahoo.com

Sent: Thursday, August 25, 2016 11:54 AM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

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Sincerely, Jim Green

From:

cobrarja2010@gmail.com

Sent:

Thursday, August 25, 2016 12:01 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

iennymidyett@comcast.net

Sent:

Thursday, August 25, 2016 12:07 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From:

e.m.howard@comcast.net

Sent:

Thursday, August 25, 2016 2:25 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

lindsayhanley@hotmail.com

Sent:

Thursday, August 25, 2016 2:53 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

fvasashisa@aol.com

Sent:

Thursday, August 25, 2016 2:56 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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I am writing to ask you to prioritize protecting the health of Kingsport residents. The best way to do that is to reject Holston Army Ammunition Plant's application for their renewal of Title V permits 568191 and 568188 until they implement safer alternatives to open burning practices and non closed loop incineration of military munitions.

From: susiebobbe@hotmail.com

Sent: Thursday, August 25, 2016 2:58 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: tenntrish63@aol.com

Sent: Thursday, August 25, 2016 3:10 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: jrthoman1410@gmail.com

Sent: Thursday, August 25, 2016 3:36 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

klvaught@bellsouth.net

Sent:

Thursday, August 25, 2016 3:53 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

davidb4444@yahoo.com

Sent:

Thursday, August 25, 2016 4:01 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

contra481@gmail.com

Sent:

Thursday, August 25, 2016 4:37 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: shanbmowr@comcast.net

Sent: Thursday, August 25, 2016 4:55 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

myrarachael@yahoo.com

Sent:

Thursday, August 25, 2016 5:05 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

kbt618@yahoo.com

Sent:

Thursday, August 25, 2016 5:07 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

checa303@gmail.com

Sent:

Thursday, August 25, 2016 6:01 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From: Sent: tthomasmacnamara@yahoo.com Thursday, August 25, 2016 6:46 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

The open-burning practices of explosives, and explosive contaminated materials, at Holston Army Ammunition Plant in Kingsport create toxic emissions that impact the air quality and health of nearby residents.

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From: tnshaws2000@bellsouth.net

Sent: Thursday, August 25, 2016 7:57 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Respectfully,

From:

kimberlypotts7556@yahoo.com

Sent:

Thursday, August 25, 2016 8:13 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From: debbrawner@att.net

Sent: Thursday, August 25, 2016 8:25 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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Sincerely,

Ċ

From: djacques8@bellsouth.net

Sent: Thursday, August 25, 2016 8:58 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

jimandsam@aol.com

Sent:

Thursday, August 25, 2016 9:22 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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From:

mhagee@excite.com

Sent:

Thursday, August 25, 2016 9:46 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

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From: Sent: robertdalesweeney@yahoo.com Thursday, August 25, 2016 10:36 PM

To: Moe Baghernejad

Subject: End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

I am a Tennessean concerned about children's health and air pollution.

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From:

lizhoyle@yahoo.com

Sent:

Monday, August 29, 2016 6:36 PM

To:

Moe Baghernejad

Subject:

End Open Burning of Explosives in Kingsport

Dear Mr. Moe Baghernejad,

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Sincerely, LB