Actually, We Did Start the Fire, and It Keeps on Burning: The Environmental Health Effects of Military Burn Pits in Afghanistan and Iraq

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ACTUALLY, WE DID START THE FIRE, AND IT KEEPS ON BURNING: THE ENVIRONMENTAL HEALTH EFFECTS OF MILITARY BURN PITS IN AFGHANISTAN AND IRAQ

I. INTRODUCTION

"There is no such thing as the EPA here, folks."¹

The United States Department of Defense (DoD) recognized fifteen years ago that "America's national interests are inextricably linked with the quality of the earth's environment, and that threats to the environmental quality affect broad national economic and security interests."² A variety of environmental concerns, such as the destruction of forests, pollution of oceans, and loss of animal life, affect the safety of United States citizens abroad.³ While the DoD implements environmental policies overseas that take into consideration the health and safety of U.S. citizens, the DoD has nonetheless failed to adequately regulate the environmental consequences of military bases abroad.⁴

The lack of environmental regulation on overseas bases enables the military to dispose of waste in an environmentally harmful way.⁵ According to the DoD, U.S. military operations in Afghanistan and Iraq generate roughly ten pounds of solid waste per soldier each day.⁶ The large volume of waste and lack of disposal

¹. Dina Fine Maron, Air Pollution: 'There's No Such Thing as the EPA Here', GREENWIRE (Nov. 11, 2009), http://www.eenews.net/public/Greenwire/2009/11/11/1 (quoting Russell Keith, remote duty paramedic at Joint Base Balad, when talking to his new hires about environmental conditions at Joint Base Balad).


⁴. See id. at 204 (emphasizing importance of DoD's overseas environmental policies). For a further discussion surrounding the failure of the DoD to implement effective regulations for military burn pits, see infra notes 57-72 and accompanying text.

⁵. For a discussion of the unsound ways in which the military disposes of waste, see infra notes 38-72 and accompanying text.

regulations prompted the military to primarily rely on open pit burning as the most expedient and cost effective method to remove the generated waste.  

Removing waste through open pit burning potentially causes serious health ramifications for soldiers on military bases. Soldiers, scientists, medical experts, and the media similarly conclude that burn pit inhalation causes serious illnesses and injuries, as well as death. The health effects from burning waste are so pervasive and detrimental that some medical experts dub burn pits the “Agent Orange” of our generation. Official United States government reports, on the other hand, argue there is insufficient evidence to prove military burn pits pose any significant long-term health effects on soldiers.

7. See id. at 30 (explaining April 2010 DoD report to Congress). “[D]uring military operations, open air burning will be the safest, most effective, and [most] expedient manner of solid waste reduction until current research and development efforts produces better alternatives. DOD officials added that burn pits are the most cost-effective waste management practice.” Id.

8. For a discussion of adverse health effects from burn pit exposure, see infra notes 73-167 and accompanying text.

9. See generally Armed Forces Health Surveillance Ctr., The Naval Health Research Ctr. & The U.S. Army Pub. Health Command, Epidemiological Studies of Health Outcomes Among Troops Deployed to Burn Pit Sites 4 (May 27, 2010), available at http://fhp.osd.mil/pdfs/100604_FINAL_Burn_Pit_Epi_Studies.pdf (noting similar health issues among veterans). “[A]ncedotal reports of complaints by Service members of eye and respiratory symptoms have been attributed to exposure to burn pit smoke, and news outlets and Members of Congress have expressed concern that exposure to burn pit smoke in certain deployed settings is causing adverse health effects.” Id. For a further discussion of medical experts, media, and soliders concluding military burn pits cause long-term damage to troops, see infra notes 125-167 and accompanying text.


In 2010, due to public outcry over burn pits, the government published two official studies investigating the health effects of burn pit inhalation. These reports—one conducted by the Government Accountability Office (GAO) and another jointly conducted by the Armed Forces Health Service Center (AFHSC) and the Naval Health Research Center (NHRC)—are contradictory, incomplete, and inadequate. Without conclusive data, the debate continues regarding both the harmfulness of burn pits to the surrounding environment, and the necessary precautions to prevent such harm.

This Comment examines the use, regulation, and environmental health effects of burn pits in Afghanistan and Iraq. Part II provides a brief overview of the U.S. military’s use of burn pits in Afghanistan and Iraq. Part III discusses military burn pit regulations and the DoD’s failure to implement coherent and enforceable policies. Part IV analyzes the ongoing debate regarding the harmfulness of burn pits to soldiers and the surrounding environment. Finally, Part V discusses DoD improvements to burn pit policies, alternative approaches to waste management, and the difficulties soldiers face in obtaining compensation for burn pit injuries.
II. OVERVIEW OF MILITARY BURN PITS

The DoD disposed of waste in open burn pits since the beginning of military operations in Afghanistan in 2001 and Iraq in 2003. Generally, open burning occurs in either shallow excavations or surface features with berms. Burn pits typically accumulate the following types of waste: batteries, plastics, biohazard materials, solvents, asbestos, chemical and medical wastes, items doused with diesel fuel, Styrofoam, food from dining facilities, discarded electronics, clothing, tires, metal containers, furniture, and even human remains. Upon burning the waste products, various toxins are released into the air: dioxins, particulate matter, polycyclic aromatic hydrocarbons, volatile organic compounds, carbon monoxide, and hexachlorobenzene.

Burn pits remain prevalent on military bases in Afghanistan, and were also prevalent in Iraq until recently. In August 2010, the United States Central Command (CENTCOM) estimated there were 251 burn pits in Afghanistan and twenty-two in Iraq. In addition to the large quantity of burn pits utilized in Afghanistan and Iraq, the magnitude of certain burn pits is staggering. The Joint Base Balad (JBB) operated the largest burn pit in Iraq, which peaked at nearly 240 tons of burned trash per day in 2007. The average daily disposal rate at JBB nearly triples that of Juneau, Alaska—a city comparable in population with an average disposal rate of 80 tons per day.

20. See generally U.S. Gov’t Accountability Office, supra note 6, at 1 (reporting use of military burn pits since outset of Iraq and Afghanistan wars).
21. See generally id. (describing general characteristics of military burn pits). For the purposes of this Comment, a berm is defined as "a narrow shelf, path, or ledge typically at the top or bottom of a slope." Merriam Webster, Merriam-Webster’s Collegiate Dictionary, Bem Definition 107 (Frederick C. Mish et al. eds., 10th ed. 2001).
24. See generally U.S. Gov’t Accountability Office, supra note 6, at 8-9 (describing pervasiveness of military burn pits in Afghanistan and Iraq).
25. Id. at 9 (enumerating number of burn pits in Afghanistan and Iraq as of August 2010).
27. See Kennedy, War-zone, supra note 10 (specifying details of waste burned at JBB burn pit in Iraq).
rate of eighty-three tons of waste per day.\textsuperscript{28} Over a period of four years, the JBB often used jet fuel to burn the trash, which included plastics, food, and medical waste.\textsuperscript{29} Thus, the JBB burn pit spewed acrid smoke over the housing and hospital sites on the military base for four years.\textsuperscript{30}

As 30,000 people are present at the JBB at any given time, the number of individuals potentially exposed to this toxic smoke is in the tens of thousands.\textsuperscript{31} The military eventually shut down the JBB burn pit, yet as of May 2011 seventy-eight burn pits remain throughout Afghanistan and continuously expose troops to toxic fumes.\textsuperscript{32} Estimates reveal that approximately 350,000 troops have been exposed to toxic fumes from open-air burn pits in Afghanistan and Iraq.\textsuperscript{33}

Further, military personnel paid little attention to the specific items tossed into the burn pits for much of the last ten years.\textsuperscript{34} In July 2008, an army aviator explained the military’s indiscretion, noting, “Anything and everything gets burned, and we get to breathe the smoke.”\textsuperscript{35} This imprudence results from the DoD’s failure to regulate burn pits throughout most of the Iraq and Afghanistan wars.\textsuperscript{36} The army aviator expounded upon the DoD’s lack of urgency in creating environmentally safe waste disposal policies when

\begin{itemize}
\item \textsuperscript{29} See generally Levine, supra note 26 (describing quantity of waste burned with jet fuel).
\item \textsuperscript{30} See \textit{id.} (detailing how smoke blew over hospital and living quarters of military at JBB).
\item \textsuperscript{33} See generally Brie Cadman, Veterans Fight for Benefits After Toxic Burn Pit Exposures, \textit{Change.org} (Oct. 5, 2010), http://news.change.org/stories/veterans-fight-for-benefits-after-toxic-burn-pit-exposures (approximating 350,000 troops were exposed to burn pit fumes in Iraq and Afghanistan).
\item \textsuperscript{34} See U.S. Gov’t \textit{Accountability Office}, supra note 6, at 8 (describing CENTCOM’s 2009 comprehensive guidance regarding operation and monitoring of open pit burning).
\item \textsuperscript{35} Kennedy, \textit{Burn Pit}, supra note 28 (quoting army aviator’s description of JBB burn pit).
\item \textsuperscript{36} See generally, U.S. Government \textit{Accountability Office}, supra note 6, at 45 (summarizing conclusions of GAO report).
\end{itemize}
he explained, “There is no way on Earth this would ever be allowed back home because of all the toxins and pollutants that result, but hey, we’re not at home, so it must be OK, right?”\textsuperscript{37}

III. BURN PIT REGULATION IN AFGHANISTAN AND IRAQ

The military relied heavily upon open burn pits to dispose of large quantities of solid waste since the beginning of the wars in Afghanistan and Iraq; however, CENTCOM did not develop comprehensive guidelines on operating or monitoring burn pits until 2009.\textsuperscript{38} Prior to issuing guidelines, the military merely noted the inherent dangers of open burning and suggested various alternatives, such as landfills and pollution prevention.\textsuperscript{39} A September 2006 Army Technical Bulletin on Guidelines for Field Waste Management noted “troops should use open burning only in ‘emergency situations,’ because it can lead to ‘significant environmental exposures.’”\textsuperscript{40}

A. DoD Regulations and Supplemental Guidance

In 2006, the Multi-National Corps-Iraq (MNC-I) engineering staff developed policies to address various environmental issues in Iraq, including hazardous and solid wastes.\textsuperscript{41} CENTCOM then issued the developed policies to U.S. forces in Iraq as fragmentary orders (FRAGO).\textsuperscript{42} While these FRAGOs were consolidated into the MNC-I Environmental Standard Operating Procedure 2006 (2006 Operating Procedure) and discouraged use of burn pits, the 2006 Operating Procedure did not provide the military with policies addressing the operation or monitoring of burn pits.\textsuperscript{43}

In April 2009, the MNC-I revised the 2006 Operating Procedure “to provide environmental guidance to U.S. forces... and civilian

\textsuperscript{37} Kennedy, Burn Pit, supra note 28 (quoting army aviator’s explanation of almost nonexistent burn pit regulations overseas).

\textsuperscript{38} See U.S. Gov’t Accountability Office, supra note 6, at 8 (emphasizing implementation of military burn pits began at start of both wars in 2001 and 2003, but comprehensive regulations were not enacted until 2009).

\textsuperscript{39} See id. at 10 (underscoring early guidance merely noted military burn pits presented some dangers).

\textsuperscript{40} Id. (quoting Army Technical Bulletin on Guidelines for Field Waste Management).

\textsuperscript{41} See id. at 10-11 (describing implementation of environmental policies through MNC-I).

\textsuperscript{42} See id. (detailing issuance of MNC-I environmental policies).

\textsuperscript{43} U.S. Gov’t Accountability Office, supra note 6, at 10-11 (noting lack of comprehensive detail on environmental regulations for operating or monitoring burn pits in Iraq).
contractors, operating in Iraq." The *MNC-I Environmental Standard Operating Procedure 2009 (2009 Operating Procedure)* described burn pits as "an expedient means to destroy solid waste during contingency operations." The *2009 Operating Procedure*, however, expressly forbade open burning without written authorization from the base commander. When authorized by a base commander, the procedures prohibited destruction of specific items in burn pits, including hazardous waste, batteries, tires, electronics, and appliances. Further, the *2009 Operating Procedure* provided guidance on "siting burn pits, securing them, managing burn pit ash, and overseeing open burning."

Consistent with the 2006 and 2009 MNC-I guidance, in September 2009, the U.S. Forces-Afghanistan (USFOR-A) issued guidelines focused on best management practices during contingency operations in Afghanistan. The USFOR-A stated, "the ultimate goal for enduring bases in Afghanistan is to transition to composting and recycling, to nearly eliminate the need for all forms of incineration." The USFOR-A guidance expanded the list of prohibited burn items established in the MNC-I guidance and additionally banned pesticide containers, asphalt shingles, treated wood, and coated electrical wires. Also in September 2009, CENTCOM issued Regulation 200-2, which created more stringent regulations than MNC-I or USFOR-A and further restricted what items may be disposed of in burn pits.

To further enhance environmental regulation of burn pits, Congress enacted the National Defense Authorization Act (NDAA)

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44. Id. at 11 (elaborating upon *MNC-I Environmental Standard Operating Procedure 2009* revisions to *Operating Procedure 2006* in order to create specific guidance for handling of waste during contingency operations).

45. Id. (explaining position of *Operating Procedure 2009* that burn pits reflect one way to dispose waste expediently).

46. See id. (explaining key difference between *Operating Procedure 2009* and *Operating Procedure 2006*).

47. Id. (listing items prohibited from burn pits in *Operating Procedure 2009*).

48. U.S. Gov’t Accountability Office, supra note 6, at 11 (finding *Operating Procedure 2009* incorporates more comprehensive guidelines).

49. See id. (comparing *Operating Procedure 2006* and *Operating Procedure 2009* with USFOR-A guidance).

50. Id. (emphasizing USFOR-A ultimate goal as transitioning from burn pits to more environmentally responsible waste disposal methods).

51. See id. at 11-12 (comparing items prohibited from burn pits in MNC-I guidance and items prohibited in USFOR-A guidance).

52. See id. at 12 (discussing CENTCOM regulation 200-2 and DoD trend toward implementing more stringent regulations).
for Fiscal Year 2010, in October 2009.\textsuperscript{53} "Section 317 of the [NDAA] requires DoD to prescribe regulations prohibiting the disposal of covered waste in open-air burn pits during contingency operations, except in circumstances in which the Secretary of Defense determines that no alternative disposal method is feasible."\textsuperscript{54} In March 2010, the DoD further prohibited disposal of covered waste in open-air burn pits through issuance of Directive-type Memorandum (DTM) 09-232 in adherence to the Section 317 requirements.\textsuperscript{55} According to a senior DoD official, "the DTM is a worldwide policy that applies to all DoD components, including CENTCOM."\textsuperscript{56}

B. The DOD’s Burn Pit Regulation Failures

Burn pit regulation, as summarized in the GAO report, provides only a bare-bones sketch of the complications surrounding the regulation of burn pits.\textsuperscript{57} In reality, the DoD’s actions overseas are governed by a complicated series of international treaties, Status of Forces Agreements (SOFAs), U.S. domestic laws and regulations, and DoD instructions, directives, and technical manuals.\textsuperscript{58} There are few obligations requiring the DoD to protect human health because most U.S. environmental laws and regulations do not have extraterritorial application.\textsuperscript{59} As a result, the DoD governs its actions abroad with its own policies, directives, instructions, and program and field manuals, all of which may not have legally binding effects.\textsuperscript{60} Since many U.S. environmental laws do not have extraterritorial application, the Overseas Environmental Baseline Guidance Document (OEBGD) creates baseline environmental standards incorporating those requirements of U.S. law that have


\textsuperscript{54} Id. at 12-13 (describing section 317 of NDAA act as prohibiting pit burning unless no feasible alternative disposal method).

\textsuperscript{55} See id. at 13 (delineating DTM 09-232 as a response to § 317 of NDAA).

\textsuperscript{56} Id. (explaining general applicability of DTM 09-232 and specific applicability to all DoD burn pit policies and regulations).

\textsuperscript{57} See generally Kate Donovan Kurera, Comment, Military Burn Pits in Iraq and Afghanistan: Considerations and Obstacles for Emerging Litigation, 28 Pace Envtl. L. Rev. 288, 293 (2010) (describing complexity of DoD’s implementation of environmental policies regarding burn pits in Iraq and Afghanistan).

\textsuperscript{58} See id. at 293 (cataloguing various regulations, treaties, and agreements governing DoD environmental policies abroad).

\textsuperscript{59} Id. at 294 (explicating most U.S. environmental laws and regulations do not have extraterritorial application).

\textsuperscript{60} See id. at 295 (explaining difficulties involved in DoD enforcement of environmental regulations overseas).
extraterritorial application, and are applicable to DoD installations, facilities, and actions.61 DoD officials, CENTCOM officials, and senior military officers acknowledge U.S. forces have not always adhered to burn pit guidance.62 Prior to CENTCOM’s 2009 regulation, many items “were routinely disposed of in burn pits” despite the prohibitions, including “regulated medical waste, hazardous waste, and substantial qualities of plastic.”63 Options for waste disposal were limited early on in both wars because officials viewed troop safety and mission success as more important than environmental concerns during combat.64

CENTCOM inconsistently implemented the 2009 regulation for several reasons.65 First, the GAO found environmental officials occasionally unaware of the regulations and requirements for burn pit operations.66 Without proper guidance, burn pit operators lacked the necessary knowledge to minimize the risks associated with exposure to burn pit emissions.67 Second, adherence to safety regulations proved difficult because many of the supplies arriving at the bases were made or packaged in burn pit prohibited materials.68 Drinking water, for example, arrived in plastic bottles that

62. U.S. Gov’T ACCOUNTABILITY OFFICE, supra note 6, at 16 (stating DoD inconsistently followed health protection guidelines regarding burn pits).
63. Id. (determining U.S. forces have not always followed protocol in Afghanistan and Iraq).
64. See id. (discussing limited waste disposal options in early stages of Afghanistan and Iraq wars and recognizing inherent difficulties in implementing environmental regulations when DoD’s main concern was troop safety during combat missions).
65. For a further discussion of the reasons for variability in implementation of CENTCOM’s 2009 regulations, see infra notes 66-72 and accompanying text.
66. See U.S. Gov’T ACCOUNTABILITY OFFICE, supra note 6, at 19 (finding environmental officials at Iraq’s Warhorse base unaware of regulations and compliance requirements). The two service members managing the Warhorse burn pit attested that “they used a standard operating procedure document provided to them when they began managing the burn pit in August 2009.” Id. According to one of the service members, “the main purpose of this guidance was to direct their dealings with contractors delivering waste to the burn pit.” Id.
67. See id. (explaining lack of proper guidelines prevents safe disposal of waste).
68. See id. (adhering to regulations requires supplies be packaged in more environmentally friendly methods).
were shrink-wrapped in plastic.\textsuperscript{69} Third, contractors did not always have contracts reflecting current guidance.\textsuperscript{70} Additionally, when DoD officials requested the contractor to incorporate the modified DoD provisions, “such contract modifications [were] typically long and tedious, often requiring months of negotiations.”\textsuperscript{71} Another reason for the disparity in burn pit safety across bases was the variance among the resources and commitments of base commanders and environmental officers.\textsuperscript{72}

IV. ENVIRONMENTAL HEALTH EFFECTS FROM BURN PIT EXPOSURE

Burn pit exposure has generated complaints from service members since 2003.\textsuperscript{73} According to the GAO, U.S. forces in Afghanistan and Iraq do not sample or monitor burn pit emissions as provided byCENTCOM regulations.\textsuperscript{74} The AFHSC and NHRC could not collect data on individual exposure to smoke or hazard-

\begin{itemize}
  \item \textsuperscript{69} See id. (describing commonly used supply methods and packaging materials as example of challenges associated with adhering to CENTCOM regulations).
  \item \textsuperscript{70} See id. (illustrating lack of compliance with overseas base relying upon and observing MNC-I Environmental Standard Operating Procedure 2006 as noted in burn pit contract, rather than more recent 2009 regulations).
  \item Thus the company provided Iraq burn pit management activities in the context of that guidance, which contains less stringent requirements than the CENTCOM 2009 regulation. According to the contractor’s representative, the company prepared plans, which DOD reviewed and approved, based on the MNC-I 2006 guidance. However, DOD officially requested the contractor incorporate MNC-I Environmental Standard Operating Procedure 2009 into its operations.
  \item Id.
  \item \textsuperscript{71} U.S. Gov’t Accountability Office, supra note 6, at 19 (concluding outdated contracts result in contractor inability to abide by relevant and applicable environmental regulations).
  \item \textsuperscript{72} See id. at 20 (explaining impact of variances in resources and commitments of involved personnel).
  \item [A]ll four of the burn pits we visited had programs to sort incoming waste to avoid burning prohibited items and to remove anything that could be used against U.S. forces. However, the amount of resources devoted to this activity varied substantially. At Al Asad, for example, a commissioned officer oversaw all burn pit and incinerator activities. At this base, an Iraqi contractor under U.S. servicemembers’ supervision sorted waste before it went into the burn pit, segregating certain waste for recycling, such as large plastics, metals, wood, mattresses, rubber and reusables (such as furniture). This process required a crew of 15 to 20 people and took all day.
  \item U.S. Gov’t Accountability Office, supra note 6, at 20.
  \item \textsuperscript{73} See U.S. Army Ctr. for Health Promotion and Preventive Medicine (USACHPPM), No. 47-002-1208, Just the Facts: Balad Burn Pit 1 (2008), available at http://phc.amedd.army.mil/phc%20resource%20library/baladburnpit471208.pdf (noting service members lodged complaints regarding burn pits since beginning of Iraq war).
  \item \textsuperscript{74} See U.S. Gov’t Accountability Office, supra note 6, at 31 (finding military has not adhered to regulation and established "systems to sample or monitor
ous chemicals, leaving the Epidemiological Studies of Health Outcomes Among Troops Deployed to Burn Pit Sites Report (ESHO Report) without the necessary information to assess the impact of burn pit exposure on soldiers.\textsuperscript{75} As a result of the military and government investigators' inability to collect sufficient data on burn pit emissions or exposure, the health impacts from burn pit exposure are not well understood.\textsuperscript{76}

Without data on individual exposure, there is a wide spectrum of thought on the harmfulness of burn pit exposure to soldiers.\textsuperscript{77} Some view burn pits as having "no substantial or consistent health effects" on troops, such as the official ESHO Report.\textsuperscript{78} The ESHO Report emphasized the difficulty in establishing a causal relationship between environmental exposure and illness.\textsuperscript{79}

On the other side of the debate, medical studies by the Allergy, Pulmonary and Critical Care Medicine Division of Vanderbilt University found that burn pits do contribute to widespread respiratory pollutants emitted from burn pits and incinerators and documentation of potential exposures\textsuperscript{\textdaggervert}).

\textsuperscript{75} See Def't of Def., supra note 11, at 3 (2010) (maintaining reservations due to lack of individual exposure data to environmental particulates and expressed concerns during meetings and teleconferences held by environmental/occupational physicians and epidemiologists at the Services' public health hubs and at AFHSC).

\textsuperscript{76} See U.S. Gov't Accountability Office, supra note 6, at 31 (recognizing lack of data on individual exposure and DoD's inability to follow sampling requirements results in misjudged health impacts of burn pit exposure).

[When burn pit sampling shows high levels of certain pollutants, the regulation directs relevant officials to determine the cause and identify solutions. Additionally, the regulation identifies substances that should be considered for sampling from burn pits at least yearly. These substances and the health risks they pose as described by EPA or the Agency for Toxic Substances and Disease Registry include: carbon monoxide . . . dioxins . . . particulate matter 10 and 2.5 . . . polycyclic aromatic hydrocarbons . . . hexachlorobenzene . . . and volatile organic compounds.

\textit{Id.}

\textsuperscript{77} Compare Bartoo, supra note 10, at 22 (finding inhalation of smoke from military burn pits can cause widespread and serious respiratory problems); with Def't of Def., supra note 11, at 2 (finding "no substantial or consistent health effects in personnel assigned to locations with burn pits at the bases examined, on a population-wide basis, compared to other deployers").

\textsuperscript{78} Def't of Def., supra note 11, at 2 (concluding study did not produce any evidence to suggest military burn pit inhalation causes adverse health effects).

\textsuperscript{79} See James Risen, Veterans Sound Alarm Over Burn Pit Exposure, N.Y. TIMES, Aug. 6, 2010, at A10, available at http://www.nytimes.com/2010/08/07/us/07burn.html (cautioning of difficulties involved in establishing causality between environmental exposure and illness); see Def't of Def., supra note 11, at 1, 3 (drawing conclusions but also recognizing limitations associated with epidemiological studies).
problems in the Middle East. In fact, the studies determined burn pit exposure is comparable to Vietnam’s Agent Orange and Desert Storm’s Gulf War Syndrome. Several other independent studies asserted that official government studies are inadequate and downplay any connection between soldier illnesses and burn pit exposure. Thus, a growing fissure exists between the government’s official position, under which the DoD, VA, AFHSC, and NHRC proceed cautiously in linking soldiers’ symptoms to burn pit exposure, and the position of non-governmental reports, which concludes that military burn pits cause significant respiratory problems and other illnesses. Determining the severity and duration of burn pit exposure injuries and illnesses will determine two issues: whether the Department of Veteran Affairs (VA) will compensate military personnel for such maladies, and whether soldiers and their families can prevail in lawsuits against military contractors.

A. The GAO Report and Its Shortcomings

Two government reports released in 2010 examined the health effects of military burn pit exposure—the GAO report entitled DoD Should Improve Adherence to Its Guidance on Open Pit Burning and Solid Waste Management (GAO Report), and the ESHO Report conducted by the AFHSC and the NHRC. Pressured by complaints from veterans and members of Congress, the VA funded the Institute of

80. See Bartoo, supra note 10, at 22 (finding correlation of respiratory problems with wars in Afghanistan and Iraq).
81. See id. (comparing burn pit exposure to Agent Orange).
82. See id. (recognizing inadequacies in government studies of burn pit exposure).
83. For a further discussion of the fissure between the federal government’s hesitation to link soldiers’ symptoms to burn pit exposure, and the view of outside medical reports discerning a causation between military burn pits and significant respiratory problems and other illnesses, see infra notes 88-168 and accompanying text.
84. See generally Kurera, supra note 57, at 300 (holding soldier Plaintiffs must prove burn pit smoke is “more likely than not the cause of their injuries” to prevail in class action lawsuit against military contractor KBR in toxic tort suit); Letter from Dep’t of Veteran Affairs to All Veteran Affairs Regional Offices (Apr. 26, 2010), available at militarytimes.com/static/projects/pages/VA_environmental_letter.doc (finding service members can be exposed to environmental hazards in course of their military duties, which may result in adverse health effects). “Numerous environmental hazards in Iraq, Afghanistan, and other military installations that could potentially present health risks to service members and Veterans have been identified.” Letter from Dep’t of Veteran Affairs to All Veteran Affairs Regional Offices (Apr. 26, 2010), available at militarytimes.com/static/ projects/pages/VA_environmental_letter.doc.
85. For further elaboration on the two government issued burn pit reports, see infra notes 88-112 and accompanying text.
Medicine (Institute) to conduct a large-scale study of the health effects arising from burn pit exposure.\textsuperscript{86} The Institute projects the report will be finalized by the fall of 2011.\textsuperscript{87} The VA instructed the GAO only in part to examine the air quality and potential health impacts of burn pits.\textsuperscript{88} Consequently, the GAO Report's discussion of health effects from burn pit exposure is limited.\textsuperscript{89} Instead, the report highlights "neither U.S. Forces in Afghanistan nor Iraq have monitored burn pit pollutants as directed," because they have not produced data on individual exposure to burn pits.\textsuperscript{90} Thus, the GAO found the "health impacts of burn pit exposure on individuals are not well understood."\textsuperscript{91} The GAO Report concluded that when the ESHO Report is released it will "assist in efforts to understand the health effects associated with exposure to burn pit smoke by conducting additional epidemiological studies."\textsuperscript{92} As the GAO predicted, the ESHO Report explored the health effects of burn pit exposure in greater detail.\textsuperscript{93}

B. The ESHO Report and Its Flaws

The ESHO Report was completed by the AFSCH and the NHRC "to look for associations of illness or other health conditions among deployed U.S. Service member populations who were assigned to locations with burn pits."\textsuperscript{94} The health conditions in-

\textsuperscript{86} See Risen, supra note 79 (discussing imminent availability of large-scale study on possible impacts of burn pit exposure).


\textsuperscript{88} See U.S. Gov'T ACCOUNTABILITY OFFICE, supra note 6, at Highlights (explaining purpose and findings of GAO report). GAO was invited to investigate the U.S. military's use of open burn pits in Afghanistan and Iraq, and subsequently report on: "(1) [the] extent of open pit burning in Afghanistan and Iraq, and whether the military has followed its guidance; (2) alternatives to burn pits, and whether the military has examined them; and (3) [the] extent of efforts to monitor air quality and potential health impacts." Id.

\textsuperscript{89} See id. at 31 (rationalizing GAO's limited focus on harm of burn pit exposure because GAO was asked only in part to discuss health impacts of burn pit exposure).

\textsuperscript{90} See generally id. (explaining deficiencies in measuring effects of burn pit exposure).

\textsuperscript{91} Id. (concluding burn pit exposure is not well understood due to limited available data).

\textsuperscript{92} Id. at 43 (stating AFHSC will conduct more thorough report).

\textsuperscript{93} For a further discussion of the ESHO report, see infra notes 94-112 and accompanying text.

\textsuperscript{94} DEP'T OF Def., supra note 11, at 1 (explaining main purpose of ESHO study as examination of burn pit exposure effects on soldiers).
cluded in the report were: "[r]espiratory symptoms and diseases, cardiovascular disease, chronic multisymptom illness (CMI), lupus erythematosus, rheumatoid arthritis, sleep apnea, and birth outcomes for infants of parents who had deployed." 95 In every area of the study, the AFSCH and NHRC determined "there was no substantial or consistent health effects in personnel assigned to locations with burn pits at the bases examined compared to other deployers." 96

While the AFSCH and NHRC adamantly contended burn pits do not have "substantial or consistent health effects" on soldiers exposed to burn pits, the report is contradictory and incomplete. 97 The introduction of the report notes personal observation and public outcry as the impetus of the study, rather than scientific evidence. 98 It states, "anecdotal reports of complaints by Service members . . . news outlets and Members of Congress have expressed concern that exposure to burn pit smoke in certain deployed settings is causing adverse health effects." 99

The report is at times contradictory and discounts data potentially attributable to negative health effects from burn pit exposure. 100 For example, the study concluded the primary analysis for burn pit exposure before and during pregnancy for active duty military personnel "was not associated with an increase in birth defects." 101 Two sentences later, however, the NHRC found an increased risk of birth defects among infants of male service members deployed to a burn pit region more than 280 days prior to

95. Id. (listing specific illnesses and injuries studied and potentially associated with burn pit exposure).

96. Id. at 2 (concluding study yielded no tangible results to substantial military burn pit exposure as cause of adverse health effects on soldiers).

97. Id. at 2 (indicating no link found between military burn pit exposure and adverse health effects). For further discussion of the ESHO report as contradictory, incomplete, inadequate, and seemingly adamant stance that military burn pits do not cause serious long-term health effects on soldiers, see infra notes 100-112 and accompanying text.

98. See generally Armed Forces Health Surveillance Ctr., supra note 9, at 3 (explaining underlying concerns regarding health risks for soldiers inhaling burn pit smoke).

99. Id. at 3 (explaining, in part, study was conducted to explore effects of burn pit exposure).

100. For a further discussion of the substantively contradictory nature of the ESHO report and attempt to diminish data potentially attributable to negative health effects from burn pit exposure, see infra notes 101-108 and accompanying text.

101. See Armed Forces Health Surveillance Ctr., supra note 9, at 4 (citing NHRC study revealing birth defects from burn pit exposure).
their infant’s date of conception. Further, the study discounts data suggesting a correlation between burn pit exposure and an increased risk of lupus. It first concluded it was possible burn pit exposure was not generally associated with an increased risk in lupus, but later stated there existed a statistically elevated risk of newly reported lupus for those deployed within close proximity to the JBB burn pit.

Additionally, the AFSCH and NHRC are skeptical of the JBB burn pit exposure statistics. JBB had the highest proportion of service members report exposure to smoke from burning trash and feces, as well as the highest percentage of medical encounters regarding respiratory issues. The AFSCH and NHRC diminish the JBB data since “it is not known if results are reflective of actual health problems and exposures or simply a reflection of personal differences in how the [soldier] was completing the forms.” The AFSCH and NHRC are also skeptical of soldiers’ recollections of burn pit exposure and advise those reading the report that “deployment form data should be interpreted cautiously,” because self-reported exposures and health outcomes from JBB may be subject to a reporting or recall bias.

Moreover, the AFSCH and NHRC acknowledge some limitations of the study. The study did not collect data on individual exposure to smoke or hazardous chemicals, arguably leading to inadequate and misleading data. Further, the AFSCH and NHRC could not measure potential misclassifications regarding actual and

102. See id. at 4 (explaining NHRC study found statistically significant increase in risk of birth defects among infants born to fathers exposed to burn pits more than 280 days prior to conception of infant).
103. For further examination of ESHO contradictions and discredit of data indicating negative health effects from the ESHO lupus findings, see infra notes 104-108 and accompanying text.
104. See Armed Forces Health Surveillance Ctr., supra note 9, at 4 (determining NHRC conclusion of relationship between burn pit exposure and risk of lupus should be further investigated).
105. For a further discussion of the skepticism surrounding AFSCH and NHRC analyzes of JBB burn pit exposure statistics, see infra notes 106-108 and accompanying text.
106. See Armed Forces Health Surveillance Ctr., supra note 9, at 17-19 (reporting and discussing findings from JBB study).
107. Id. (offering caveat for potential inaccuracy of statistics from JBB).
108. See id. (explaining rationale underlying skepticism regarding soldiers’ recollections).
109. See id. (noting several limitations to studies conducted by AFSCH and NHRC report).
110. See id. (determining unavailability of data on individual environmental exposures over time).
Finally, the study did not include data for longer-term trends, which is often standard practice for studies examining toxic exposure.112

C. Non-Governmental Reports

Non-governmental reports offer evidence contrary to the AF SCH and NHRC’s conclusion of “no substantial or consistent health effects in personnel assigned to locations with burn pits at the bases examined compared to other deployers.”113 Beginning in 2006, Air Force Lieutenant Colonel Darrin Curtis, a former bioenvironmental flight commander at JBB, issued a memorandum identifying a burn pit as an “acute health hazard for individuals.”114 In response to Lieutenant Curtis’s memorandum, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) conducted periodic sampling of the air at JBB from 2003 to 2007.115 USACHPPM’s sampling indicated the presence of harmful pollutants such as “dioxins, polyaromatic hydrocarbons, and volatile organic compounds,” but all pollutants were reported within acceptable ranges, according to Military Exposure Guidelines (MEG).116 After completion of the sampling, USACHPPM maintained that “long-term health effects are not expected to occur from breathing the [burn pit] smoke.”117

Medical experts, however, challenged the government’s conclusions.118 During a November 2009 Senate Democratic Policy Committee Hearing on military burn pits, Dr. Anthony Szema, Chief of the Allergy Section at the Veterans Affairs Medical Center,

111. DEP’T OF DEF., supra note 11, at 2 (listing limitations of ESHO study and emphasizing possible misclassification of individuals as exposed to burn pits in the absence of individual exposure statistics).


113. For a further discussion on non-governmental reports and evidence contrary to the ESHO’s conclusion, see infra notes 114-167 and accompanying text.


115. See U.S. Army Ctr., supra note 73, at 1 (showing environmental sampling at JBB was conducted from 2003 to 2007).

116. Id. at 1 (listing harmful pollutants produced from burn pits but within acceptable ranges).

117. Id. (finding military burn pits might not cause long term adverse health effects on soldiers).

118. For a further discussion on medical experts challenging government reports’ conclusions, see infra notes 119-167 and accompanying text.
disputed the accuracy of USACHPPM’s studies. Dr. Szema testified that the USACHPPM’s assessments were flawed because they did not measure the particulate matter found at military burn pits. He noted, “The size of the particulate matter is important to consider because the particles act as a carrier of various harmful chemicals in the air. The smaller the particular matter, the deeper the particles are able to travel into the lungs.” Dr. Szema testified the health risks from exposure to particulate matter include not only “risk of asthma, bronchitis, and emphysema... but there is also an association with respiratory and cardiovascular mortality—death—from inhalation of ultra fine particulate matter.”

For months after Dr. Szema’s testimony, the DoD maintained that “only minor, temporary effects have been identified with the burn pit smoke.” The DoD has now slightly reversed its position by acknowledging “burn pit smoke causes acute health effects in some people,” but “it is less clear what other longer-term health effects may be associated with burn pit smoke inhalation.”

There are other non-military medical experts determined to uncover the truth behind the respiratory ailments veterans suffer after returning from Iraq and Afghanistan. Dr. Robert Miller, an associate professor at Vanderbilt University’s Allergy, Pulmonary and Critical Care Medicine Division, and his colleagues conducted research on burn pit exposure over the last seven years. Dr. Miller testified before Congress on numerous occasions and continues to voice his concerns that soldiers are exposed to airborne tox-

119. See Are Burn Pits Making Our Soldiers Sick?: Hearing Before the S. Democratic Policy Comm., 111th Cong. 2-3 (2009) (statement from Dr. Anthony Szema, Chief of the Allergy Section, Veterans Affairs Medical Center) [hereinafter Are Burn Pits Making Soldiers Sick?] (disputing accuracy of studies).

120. See id. (noting comprehensive study of burn pit exposure needs to include size of particulate matter).

121. Id. at 2 (explaining importance of why size of particulate matter is essential to understanding adverse health effects of burn pit exposure).

122. Id. (listing health risks from burn pit exposure).


124. Kelly Kennedy, DoD Shows First Signs of Acknowledging Burn-Pit Woes, ARMY TIMES (Jan. 18, 2010), available at http://www.armytimes.com/news/2010/01/military_burn_pit_pentagon_011810w/ (showing DoD’s change in official stance on health effects from burn pit exposure); see also Kurera, supra note 57, at 293 (citing article).

125. See Bartoo, supra note 10, at 24-25 (lauding accomplishments of Dr. Miller and his studies on harmful respiratory effects of burn pit exposure).

126. See id. at 21-23 (outlining Dr. Miller’s study on detrimental effects of burn pit exposure).
...ins in Iraq and Afghanistan, which could potentially result in permanent lung damage.127

The Vanderbilt medical staff became involved when Sallie Lewis, a nurse practitioner at Blanchfield Army Community Hospital, noted a large number of soldiers with an extreme shortness of breath during their two-mile runs and an inability to pass standard physical requirements.128 The conventional tests administered to these soldiers for shortness of breath produced normal results.129 Thus, more than fifty soldiers were sent to Dr. Miller between 2003 and 2005, to whom the soldiers shared similar stories of significant exposure to sulfur fire smoke in 2003 or breathing burn pit emissions across Iraq.130 Dr. Miller consequently performed surgical biopsies to check for constrictive bronchiolitis, a rare condition involving the narrowing of the tiniest and deepest airways of the lungs.131 The biopsy results were eye-opening and conclusive—twenty-six of the thirty-one lung biopsies confirmed the soldiers had constrictive bronchiolitis.132

The medical staff agreed with the soldiers’ anecdotal evidence that exposure to toxic smoke caused the constrictive bronchiolitis.133 J.D. Williams, an aviation officer diagnosed with constrictive bronchiolitis, slept an eighth of a mile from the massive burn pits at JBB.134 Similarly, most soldiers diagnosed with constrictive bronchiolitis were exposed to burn pit smoke.135 After the conclusive results of the biopsies performed by Dr. Miller, Matthew King, a resident in the Division of Allergy, Pulmonary and Critical Care Medicine Division at Vanderbilt University, voiced his distress re-

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127. See id. at 23-25 (showing extensive effort and studies by Dr. Miller to prove burn pits can cause respiratory illness).
128. See id. at 22 (observing shortness of breath among soldiers exposed to burn pits).
129. See id. (showing conventional studies came out normal and further studies must be conducted).
130. See Bartoo, supra note 10, at 24 (finding soldiers sharing similar stories of exposure to burn pits).
131. See id. (explaining additional studies had to be conducted to determine effects of burn pit exposure on soldiers’ respiratory system).
132. See id. at 22 (releasing findings from biopsy and finding twenty-six out of thirty-one soldiers were diagnosed with constrictive bronchiolitis). For a further discussion on how the results from the biopsies have been eye-opening and quite conclusive, see infra notes 137-135 and accompanying text.
133. See Bartoo, supra note 10, at 22 (citing Dr. Miller regarding inhalation injuries, suffered in line of duty).
134. See id. (describing one soldier’s experience, which is similar to other stories shared by soldiers exposed to burn pit smoke).
135. See id. (recognizing commonalities between soldiers diagnosed with constrictive bronchiolitis).
garding soldier exposure to burn pits. King reported, “There is a lot of concern that this is the tip of the iceberg. We are asking what’s causing these illnesses and what prevention and management can we offer soldiers in the future.”

Officials of the Disabled American Veterans (ODAV) and certain members of Congress also expressed concern regarding exposure of soldiers to burn pits. More than 500 veterans contacted the ODAV complaining of illnesses they believed were caused by burn pit exposure. Representative Timothy H. Bishop, a Democrat from Long Island, took the lead on the matter in Congress. He believes the issue of burn pits will become more prominent as the health effects of burn pits become more widely recognized. Representative Bishop discussed the possibility of an increase in illnesses from burn pit exposure as “very evocative of the experience we’ve had with the exposure of toxins at ground zero in New York. Just like with ground zero, we are going to see the numbers of people who contract illnesses grow dramatically as the years pass.”

The media also conducted its own research criticizing the completeness and accuracy of the AFHSC findings. The Military Times reported Army Col. Bob Defraites, director of the AFHSC, was not able to gather morbidity data (the rate of incidence of various health problems) on the ten-year trends for troops’ health in Iraq and Afghanistan. Moreover, the AFHSC reports do not track trends over multiple years, but instead only show the current year’s figures. In response to the incompleteness of these reports, The
Military Times compiled data spanning ten years to identify longer-term trends on soldiers' health.\textsuperscript{146} The Military Times analysis of the health data from 2001 through 2009 revealed the rate of respiratory issues rose by thirty-two percent, complications related to pregnancies and births increased by forty-seven percent, and neurological conditions, such as multiple sclerosis and Parkinson's disease, rose by nearly two-hundred percent.\textsuperscript{147}

Several of these studies demonstrate that both smoke from burning wood and dioxins from burning plastic can cause heart disease and respiratory issues.\textsuperscript{148} According to the Center for Disease Control and Prevention (CDC), most individuals develop emphysema from long-term smoking; but asthma, air pollutants, genetics, and respiratory infections also lead to chronic obstructive pulmonary disorder (COPD).\textsuperscript{149} The Military Times surveillance report showed the rate of COPD per ten-thousand active-duty members increased 122 percent from 2001 to 2009.\textsuperscript{150} Further, the rate of chronic sinusitis increased by 244 percent, and the rate of lower respiratory infections increased by fifty percent.\textsuperscript{151} The CDC reports that the civilian population between ages twenty-five and fifty-four with mild or moderate COPD declined over the past twenty-five years; whereas the number of service members with mild or moderate COPD more than doubled in the past ten years.\textsuperscript{152}

Medical experts completed additional studies showing the environmental contamination of the surrounding air might be responsible for even more serious health effects on soldiers.\textsuperscript{153} Anna Johnson, an epidemiologist at the University of North Carolina who studies veteran populations, found congenital heart disease for mil-
itary members increased by 120 percent from 2001 to 2009. Obesity, a significant factor in the cause of heart disease, declined among military members, which led Johnson to attribute the increase in heart disease to environmental factors. Some studies link deaths from heart disease to biological warfare agent exposure. Soldiers exposed to sarin gas during Operation Desert Storm, for example, had an increased risk of brain cancer. Lieutenant Curtis performed an environmental sampling in Iraq and wrote a memo outlining the carcinogens, neurotoxins, and chemicals known to cause respiratory complications and other problems associated with burn pits. The morbidity data is bittersweet vindication for him as he says, "[t]he proof is in the pudding. All the environmental sampling in the world is a secondary standard to . . . the primary standard: Are people getting sick?"

With the difficulty of providing hard data and the lack of long term studies on burn pit exposure, the strongest indication that toxins released from burn pits cause serious health problems are the anecdotal stories of troops exposed to the burn pits. Of the plethora of soldiers exposed to burn pits, two anecdotal stories are salient. After spending four and a half months working as a surgeon at the Balad Combat Support Hospital, retired Air Force Lieutenant Colonel Steve Bowers said his headaches were so severe he sought an MRI when he returned home. "You don’t just come out of that environment and recover. . . . I had headaches for three months after I got home. Guys who spent 15 months there would

154. See Kennedy, Health Alert, supra note 144 (citing statistical increase in congenital heart disease for veteran populations).
155. See id. (explaining reason for statistics pointing towards environmental pollution).
156. See id. (linking toxic exposure to serious soldier illnesses).
157. See id. (listing other toxic chemicals causing soldier illness).
158. See id. (finding Lt. Curtis had large role in bringing awareness of dangers of burn pit exposure to public).
159. Kennedy, Health Alert, supra note 144 (quoting Lt. Curtis, who understood difficulty in providing conclusive data related to burn pit exposure, but thought soldier illnesses pointed towards burn pit exposure).
161. For anecdotal stories related to soldiers’ exposure to burn pit smoke, see infra notes 155-160 and accompanying text.
162. See Kennedy, Burn Pit, supra note 28 (relaying Air Force Lt. Col. Steve Bowers’ recollection of burn pit exposure).
have a harder health hit." He said virtually everyone on base had some version of "plume crud," was "coughing up black stuff," and also had "sinus problems, nasal congestion, bad coughing, and headaches." Army Sergeant Loyd Sawyer said he worked at the JBB mortuary, approximately 400 yards from the burn pit. He explained, "They had to abandon the guard tower near [the pit] because they kept getting respiratory infections. . . . It was just a wall of fire above our unit. Guys were coughing up black stuff, coughing up blood. I had a steroid inhaler because I got bronchitis." The detailed and harrowing stories from soldiers exposed to burn pits, independent studies conducted by medical experts, and investigations completed by the media paint a picture of burn pit exposure as causing detrimental and long-term health problems for soldiers.

V. THE FUTURE OF BURN PITS: REGULATIONS, LEGISLATION, AND SOLDIERS' BENEFITS

In January 2011, both Congress and the public rallied to protect soldiers from the environmental harms of unregulated military burn pits. The government did not take action until after the VA determined that Army Sergeant William McKenna died of a rare form of lymphoma due to exposure to burn pit fumes in Iraq. The death of Army Sergeant McKenna impelled the DoD to enact measures in response to the fomenting public outcry. As a result of his death, Senator Charles Schumer and Senator Bill Nelson wrote to the DoD and urged it to impose safety precautions for

163. Id. (quoting Air Force Lt. Col. Steve Bowers' experience at JBB burn pit).
164. Id. (quoting Air Force Lt. Col Steve Bowers' experience at JBB burn pit).
165. See id. (relaying Army Sgt. Loyd Sawyer's experience at JBB burn pit).
166. Id. (quoting Army Sgt. Loyd Sawyer's experience at JBB burn pit).
167. For previous discussion of soldier exposure to burn pits, independent studies conducted by medical experts, and investigations completed by the media concluding burn pit exposure causes detrimental and long-term health effects on soldiers, see supra notes 113-159 and accompanying text.
168. For further discussion of pressure from the public and Congress to protect soldiers from the harms of military burn pits, see infra notes 169-176 and accompanying text.
170. See id. (explaining why DoD finally enacted stronger measures to protect soldiers).
those working close to the noxious fumes.\textsuperscript{171} In a February 7, 2011 response letter to Senators Schumer and Nelson, Chairman of the Joint Chiefs of Staff Mike Mullen pledged that protective equipment, such as respirators and gas masks, would be made available to deployed troops near burn pits.\textsuperscript{172} Further, he promised to implement a policy promoting the use of protective equipment within sixty days.\textsuperscript{173}

Additionally, Mullen stated in his letter that, for the long-term, CENTCOM is buying and installing an estimated two-hundred solid-waste incinerators for use in Afghanistan.\textsuperscript{174} The letter also stated that all open air burn pits in Iraq were closed in 2010, and any burn pits used in Afghanistan would comply with the revised DoD regulations prohibiting incineration of hazardous and medical waste.\textsuperscript{175} Moreover, CENTCOM attempted to reduce burn pit exposure by limiting the permissible times and conditions under which to operate open fires.\textsuperscript{176} Thus, the DoD has significantly improved its burn pit policies by closing down some burn pits, and enforcing regulations on the pits still in operation.\textsuperscript{177}

While the DoD has made significant strides towards becoming environmentally responsible, there are two questions still left unaddressed.\textsuperscript{178} First, how can the DoD become more environmentally responsible when removing waste?\textsuperscript{179} Second, can troops exposed to burn pit smoke receive full benefits from the VA even though the leading governmental study concludes that “there was no substantial or consistent health effects” associated with exposure to burn pits?\textsuperscript{180}

\textsuperscript{171} See \textit{id.} (describing contents of letter Senator Charles Schumer and Senator Bill Nelson sent to DoD after death of Sgt. William McKenna).  
\textsuperscript{172} See \textit{id.} (indicating DoD's response to Senator Schumer and Nelson).  
\textsuperscript{173} See \textit{id.} (finding instructions on how to promote use of safety equipment will be ready in sixty days).  
\textsuperscript{174} \textit{See Maze}, \textit{supra} note 169 (pledging to reduce burn pits in Afghanistan by installing incinerators).  
\textsuperscript{175} See \textit{id.} (indicating further attempts to limit burn pit exposure).  
\textsuperscript{176} See \textit{id.} (indicating DoD's intention to restrict further use of burn pits in Afghanistan).  
\textsuperscript{177} For a discussion of the DoD's significant improvements in closing down burn pits and regulating the pits that cannot be shut down, see \textit{supra} notes 168-177 and accompanying text.  
\textsuperscript{178} For a discussion of two questions related to burn pit exposure, see \textit{infra} notes 179-203 and accompanying text.  
\textsuperscript{179} For a discussion on how the DoD can become more environmentally responsible when removing waste, see \textit{infra} notes 180-187 and accompanying text.  
\textsuperscript{180} \textit{See generally} Der't or Der., \textit{supra} note 11, at 2 (concluding study yielded no tangible results to substantial military burn pit exposure as cause of adverse health effects on soldiers). For a discussion of the plausibility of troops exposed to
The DoD’s path towards environmental responsibility in removing waste from Afghanistan and Iraq begins with the GAO recommendations. The GAO indicated various alternative waste management practices, such as recycling, incinerators, and landfills, to manage the DoD’s wartime waste stream, decrease the volume and potential toxicity of the waste, and reduce the potential health impacts of burn pits at U.S. bases in Afghanistan. Recycling, however, may prove to be a difficult alternative as military bases are often located in remote areas without an infrastructure to support a market for recycled materials. CENTCOM officials deemed burning waste a more viable option than implementation of an efficient recycling program, which would require: management of a sorting facility, a viable market for recycled products, and retaining trained environmental officers on the base.

DoD officials contend incinerators are the best combustion alternative to open burn pits, which is exemplified by the recent development and implementation of two-hundred solid waste incinerators in Afghanistan. Incinerators are a better alternative to open burn pits due to the more complete burn in the enclosed combustion chambers, large reduction in volume of waste, and ability to manage multiple waste streams; yet incinerators still yield potentially harmful emissions. Despite the incomplete elimination of emissions, incinerators provide more control for burning waste.

As to whether soldiers will receive compensation for burn pit injuries, the VA issued a thirty-page training letter in April 2010

burn pits receiving full benefits from the VA, despite the leading government study’s conclusion that “there was no substantial or consistent health effects” associated with exposure to burn pits, see infra notes 181-202 and accompanying text.

181. See U.S. Gov’t ACCOUNTABILITY OFFICE, supra note 6, at 22 (finding alternative to waste disposal other than burn pits).
182. See id. (holding DoD has not evaluated benefits and costs of waste management alternatives relative to its existing practices, leading to lack of key information to manage its solid waste).
183. See id. at 26 (finding USFOR-A officials concurred little recycling occurring at bases).
184. See id. (exploring reasons CENTCOM officials found difficulty in recycling).
185. See id. (stating incinerators are best alternative to burn pits and finding DoD began relying more heavily on incinerators as alternative to burn pits); see also Maze, supra note 173 (finding DoD plans on installing about 200 solid-waste incinerators in Afghanistan).
186. See U.S. Gov’t ACCOUNTABILITY OFFICE, supra note 6, at 26 (explaining incinerators also produce harmful emissions).
187. See id. at 26 (explaining controlled burn process from using incinerators is more environmentally friendly than using burn pits to remove waste).
outlining a new policy for determining veterans' benefits after exposure to environmental hazards.\footnote{188} The letter states, "Service members can be exposed to environmental hazards in the course of their military duties, which may result in adverse health effects."\footnote{189} Large burn pits throughout Iraq, Afghanistan, and Djibouti are included as hazards in the training letter.\footnote{190} The letter dictated that a veteran's lay statement of burn pit exposure is generally sufficient to establish such exposure if the veteran served in Iraq, Afghanistan, or Djibouti.\footnote{191} "Regional office personnel must also be aware that many veterans suffering from illnesses such as respiratory, cardiopulmonary, neurological, autoimmune, and/or skin disorders, may not associate such conditions with burn pit exposure."\footnote{192} Thus, the VA indicated that rating authorities must be prepared to actively review such claims by recognizing potential exposure issues whenever reasonably raised by the record.\footnote{193}

While the VA appears to adopt a sufficient policy to compensate troops for illnesses associated with burn pit exposure, obstacles remain for soldiers to receive benefits for their injuries in reality.\footnote{194} J.D. Williams, an aviation maintenance officer, was diagnosed with constrictive bronchitis over a year after his retirement, and must now prove his lung injuries are related to his service prior to receiv-

\footnote{188. See Letter from Dep't of Veteran Affairs, supra note 84, at 1 (explaining three main purposes of letter). First, it will inform regional office employees on specific environmental hazard incidents that present potential health risks to service members and Veterans. Second, it provides guidance on handling claims for disabilities potentially resulting from exposure to environmental hazards while on active duty. Third, it provides 'fact sheets' that may serve as valuable resources for VA examiners when they conduct Compensation and Pension (C&P) examinations associated with such exposure. The information and guidelines provided will ensure claims are processed in an objective and compassionate manner across all regional offices. Id.}

\footnote{189. Id. (finding numerous environmental hazards identified in Iraq, Afghanistan and other military installations could possibly pose health risks to service members and veterans).}

\footnote{190. See id. (listing military bases where burn pits are present).}

\footnote{191. See id. at 4 (explaining veterans' lay statement is sufficient because of extensive use of burn pits and lack of identification of all duty locations).}

\footnote{192. Id. (explaining many veterans will be unaware that illness or injury may be from burn pit exposure because exposure to burn pits is well-known fact). Further, if toxin exposure is raised by a veteran, he or she will generally not be aware of what toxins were released by burn pits. Id.}

\footnote{193. See Letter from Dep't of Veteran Affairs, supra note 84, at 1 (explaining rating agency must actively review records due to veterans' general unawareness of injury or illness potentially caused by burn pit exposure).}

\footnote{194. For a further discussion of veterans having difficulty receiving benefits from burn pit exposure, see infra notes 195-202 and accompanying text.}
ing compensation benefits. Further, soldiers are sometimes unaware that exposure to burn pits caused their injuries. Latent illnesses from burn pit exposure provide yet another obstacle for soldiers to receive compensation. Soldiers were exposed to burn pit smoke as early as 2004, and it becomes increasingly difficult to prove a compensable injury if the weight of proof rests on the soldiers.

Moreover, even if the VA acknowledges a soldier's health problems are a result of burn pit exposure, the VA may contend the soldier's condition will improve, and thus not fully compensate the soldier for the injuries. A prime example of the VA's policy is the story of Tim Wymore, a soldier exposed to the JBB burn pit, who has three lesions on his brain, one lesion on his eye, a blood disorder, a damaged esophagus, and a partially removed colon. The VA believes his condition may improve and has yet to declare Wymore permanently disabled, which leaves his family ineligible for many benefits. Wymore is further concerned that should he pass away, the VA will deny payment of a survivor's benefit to his wife, unless she proves his death is directly related to his military service.

Although the DoD has recently taken significant strides to protect troops against the environmental hazards of burn pits, there are many lessons from the mistakes. Soldiers remain in a precari-

195. See Bartoo, supra note 10, at 21 (explaining difficulty in receiving full benefits). Further, the article quotes Williams on the future of receiving full benefits from burn pit exposure. Id. "It may take years for me to get any compensation from this, but we need people like Dr. Miller to help out the younger guys who are being told now they have to leave their career in the military. It's an injury, but it's on the inside, something they can't see. But it has changed us." Id.

196. See Letter from Dep't of Veteran Affairs, supra note 84, at 12-13 (explaining veterans' unawareness of injuries).

197. See Kurera, supra note 57, at 300 (finding latent illnesses provide occasion for intervening events that weaken causal relationship).

198. See id. at 300-301 (explaining difficulty in proving causation if weight of proof rests on soldiers).

199. For a discussion of how the VA may acknowledge health problems related to burn pits, yet not fully compensate a soldier for his injuries if the VA believes the soldier's condition will improve, see infra notes 200-202 and accompanying text.

200. See O'Connor, supra note 87 (describing Tim Wymore's injuries and explaining his fear regarding impact on his family if he passes away).

201. See id. (finding benefits denied Mr. Wymore include medical insurance for his wife and college costs for his three sons).

202. See id. (finding difficulty in receiving death benefits from burn pit exposure).

203. For a discussion on the lessons learned from DoD's mistakes, see infra notes 204-206 and accompanying text.
ous position due to the DoD’s lack of environmental planning, slow reaction to soldiers’ complaints about burn pits, inability to produce conclusive data on burn pit exposure, and obstinate refusal to acknowledge the relationship between inhalation of toxic smoke and long-term health impacts on troops. Even though the VA lowered the burden for soldiers to receive benefits, many of those soldiers still face difficulties prior to actually receiving compensation for burn pit associated injuries. Thus, soldiers remain unwell from their exposure to burn pits, and some soldiers remain uncompensated for their injuries. The unfortunate reality is some soldiers avoided enemy fire and roadside bombs, but cannot escape illness and injury due to the DoD’s failure to regulate military burn pits.

Michael Riess*

204. For an exploration of the DoD’s mistakes surrounding burn pits in Iraq and Afghanistan, see supra notes 1-203 and accompanying text.

205. For a discussion on how the VA has made it easier to receive full benefits for exposure to burn pits and the obstacles soldiers must hurdle to receive benefits, see supra notes 188-202 and accompanying text.

206. For a discussion on how soldiers remain sick from their exposure to burn pits, see supra notes 113-167 and accompanying text, and for discussion on how some soldiers remain uncompensated for their injuries, see supra notes 188-202.

207. For a discussion of DoD’s failure to regulate military burn pits, see supra notes 39-72 and accompanying text, and for discussion on how soldiers could not escape illness and injury, see supra notes 73-167.

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