U.S. MILITARY RESPONSIBILITY FOR ENVIRONMENTAL CLEANUP IN CONTINGENCY ENVIRONMENTS

BY

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Environmental destruction is an inevitable byproduct of warfare. However, the new paradigm of U.S. military contingency operations requires a strategic vision beyond merely engaging the enemy. American military commanders in the 21st century must also seek to win the hearts and minds of a local population in order to solidify gains and ensure a lasting victory. Unfortunately, many commanders have not adapted to this new way of thinking. As a result, commanders fail to consider the long-term environmental damage inflicted by their soldiers during combat operations, damage which must be borne by the civilian population. Such damage includes hidden unexploded ordnance hazards, depleted uranium, and other hazardous waste generated by the day-to-day operations of U.S. military personnel deployed to contingency environments. Though commanders claim exigent circumstances prohibit them from implementing environmental controls, the long-term nature of current U.S. occupation—up to thirteen years—undermines these excuses. In fact, the U.S. military has a robust collection of policies, regulations, and personnel, which could be modified to limit the amount of damage caused by military deployments.

This Article examines the existing hazards in contingency environments and the collection of U.S. military regulations, which apply to "enduring" bases, and those in the Continental United States.

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Additionally, it surveys the international laws regarding environmental destruction currently applicable to U.S. deployments, as well as what methods of recourse citizens of Iraq and Afghanistan have to address environmental damage caused by the U.S. military. Finally, it proposes solutions to deal with gaps in U.S. and international law and policy in order to prevent and mediate environmental damage caused by U.S. contingency operations and provides methods of recourse by citizens of countries hosting military deployments.

I. INTRODUCTION

Seventy years after the last Allied bomb fell on Germany, accidental detonations of unexploded World War I and II ordnance remain so common German construction companies must consult sixty-year-old Allied bombing maps and have explosive ordnance disposal experts on standby before building in major metropolitan areas.[1] In August 2012, explosives experts conducted a controlled detonation of the remnants of a 550-pound World War II-era bomb discovered under a bar in Munich, Germany.[2] The detonation ignited several buildings and shattered windows across the city.[3]

1 *See* Andrew Curry, *Hunting for WWII Duds: German Firm Uses Aerial Photos to Find Bombs*, SPIEGEL, Apr. 9, 2012, http://www.spiegel.de/international/business/firm-uses-historic-aerial-photos-to-find-unexploded-wwii-bombs-a-825836-druck.html (last visited Feb. 14, 2015) (explaining that private companies use aerial photos from British and American bombers to locate buried bombs in Germany).

2 Victoria Cavaliere, *World War II-Era American Bomb Detonated in Evacuated Area of Central Munich*, N.Y. DAILY NEWS, Aug. 29, 2012, http://www.nydailynews.com/news/world/world-war-ii-era-american-bomb-detonated-evacutated-area-central-munich-article-1.1146912 (last visited Feb. 14, 2015).

3 *See id.* (explaining the blast knocked out nearby windows, and discussing and displaying pictures of the neighboring buildings engulfed in flames).

More recently, a bomb dropped on the city of Euskirchen, Germany in the 1940s claimed the life of a bulldozer driver and injured thirteen others.[4]

Unexploded ordnance (UXO)[5] is just one of many environmental hazards common to modern warfare. Complicating efforts to address these hazards is the unsettled nature of modern victory. There are no longer defined phases of conflict such as declaration, warfare, and post-conflict.[6] A new dynamic has emerged for what are now known as "contingency operations," wherein U.S. Armed Forces "are or may become involved in military actions, operations, or hostilities against an enemy of the United States."[7] Rather than declared hostilities and signing ceremonies, conflicts today are marked by fluid phases, which often overlap: pre-conflict, engagement and deterrence, seizing the initiative, decisive operations, and post-conflict.[8] This overlap often results in situations where the U.S. military is destroying the environment through combat operations and simultaneously improving it with civil works projects. In such a chaotic and potentially deadly setting, preserving the environment and remediating environmental damage from combat is often overlooked. Nonetheless, with the recent departure of U.S. military personnel from Iraq in 2011 and the

4 Anna Maja Rappard, *Suspected World War II-Era Bomb Detonates in Germany, Killing One*, CNN.COM, Jan. 3, 2014, http://www.cnn.com/2014/01/03/world/europe/germany-explosion (last visited Feb. 14, 2015).

5 Unexploded ordnance (UXO) refers to military munitions that: "(A) have been primed, fused, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded, whether by malfunction, design, or any other cause." 10 U.S.C. § 101(e)(5) (2012).

6 *See* JOINT CHIEFS OF STAFF, JOINT PUBLICATION 1, DOCTRINE FOR THE ARMED FORCES OF THE UNITED STATES ch. I, at 5–7 (Mar. 25, 2013), *available at* http://www.dtic.mil/doctrine/new_pubs/jp1.pdf [hereinafter JOINT PUB. 1] (defining "Traditional Warfare" and "Irregular Warfare"). "Irregular Warfare" is "a major and pervasive form of warfare" requiring a "combination of offensive, defensive, and stability operations" that require the consideration of "a variety of factors, such as capabilities and nature of the enemy." *Id.*

7 JOINT CHIEFS OF STAFF, JOINT PUBLICATION NO. 1-02, DEPARTMENT OF DEFENSE DICTIONARY OF MILITARY AND ASSOCIATED TERMS 77–78 (2010) (defining contingency operation as "[a] military operation that is either designated by the Secretary of Defense as a contingency operation or becomes a contingency operation as a matter of law (Title 10, United States Code, Section 101[a][13]). It is a military operation that: a. is designated by the Secretary of Defense as an operation in which members of the Armed Forces are or may become involved in military actions, operations, or hostilities against an enemy of the United States or against an opposing force; or b. is created by definition of law. Under Title 10, United States Code, Section 101 (a)(13)(B), a contingency operation exists if a military operation results in the (1) call-up to (or retention on) active duty of members of the uniformed Services under certain enumerated statutes (Title 10, United States Code, Sections 688, 12301[a], 12302, 12304, 12305, 12406, or 331-335); and (2) the call-up to (or retention on) active duty of members of the uniformed Services under other (non-enumerated) statutes during war or national emergency declared by the President or Congress.").

8 *See* JOINT CHIEFS OF STAFF, JOINT PUBLICATION NO. 3-0, JOINT OPERATIONS x, xv, xx, V-22 (2011) (noting military engagement and deterrence are ongoing, routine activities, while seizing the initiative and decisive operations occur after operations commence, and peace operations occur post-conflict).

anticipated drawdown from Afghanistan by 2016,[9] the time has come for the U.S. military to consider what, if any, actions it will take to mitigate the environmental legacy of over a decade of armed conflict, even as it turns authority over to the governments of Iraq and Afghanistan. As this Article will demonstrate, American military environmental policies and procedures in combat zones are either outdated, insufficient, or ignored outright; though environmental damage and destruction may be an inevitable result of the exigent circumstances of war, it is indefensible not to mitigate and remediate such damage once hostilities are over, and it is deemed safe enough for our departure.

Large gaps remain in U.S. military environmental policy, which threaten to undercut military efforts in Afghanistan and Iraq. A 2011 survey of U.S. Army environmental practices in contingency operations concluded:

> A review of existing strategies and policies indicated, however, that none of the documents are directed at implementing or developing sustainability as a driving factor in contingency operations. Even recent attempts by the Department of the Army to implement a Strategic Sustainability Campaign Plan have left sustainability conspicuously absent when it pertains to contingency operations.[10]

In this instance the Army defines sustainability as "the ability to simultaneously meet current as well as future mission requirements worldwide, safeguard human health, improve quality of life, and enhance the natural environment."[11]

All four of the U.S. armed services[12] acknowledge environmental protection and encourage sustainability as a contribution to the military's mission of "fight[ing] and win[ning] this Nation's wars."[13] Beyond enlightened self-interest, the military assumes certain legal and ethical responsibilities when it chooses to invade or deploy to a foreign country.

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9 See Joseph Logan, *Last U.S. Troops Leave Iraq, Ending War*, REUTERS, Dec. 18, 2011, http://www.reuters.com/article/2011/12/18/us-iraq-withdrawal-idUSTRE7BH03320111218 (last visited Feb. 14, 2015) (noting the last convoy of U.S. soldiers departed Iraq in December 2011); Gopal Ratnam, *Afghanistan Going off the Rails As U.S. Withdrawal Speeds Up*, FOREIGN POLICY, Oct. 30, 2014, http://www.foreignpolicy.com/articles/2014/10/30/afghanistan_us_poppy_taliban_SIGAR_troops_withdrawal_opium_heroine (last visited Feb. 14, 2015) (noting the anticipated gradual withdraw of remaining American troops from Afghanistan by 2016).

10 DAVID A. KROOKS & KURT J. KINNEVAN, U.S. ARMY CORPS OF ENG'RS, ANALYSIS OF POLICY AND GUIDANCE REGARDING SUSTAINABILITY AND ENVIRONMENTAL CONSIDERATIONS IN OVERSEAS CONTINGENCY OPERATIONS IN THE JOINT, INTERAGENCY, INTERGOVERNMENTAL, AND MULTINATIONAL (JIIM) ENVIRONMENT ii (2011), *available at* http://www.aepi.army.mil/docs/whatsnew/AEPI%20Sustainability%20Analysis%20Final%20v2.pdf.

11 *Id.* at vi.

12 The U.S. Armed Services are considered to be the U.S. Army (responsible for ground operations), the U.S. Navy (responsible for seagoing operations), and the U.S. Air Force (responsible for air operations). A fourth service, the Unites States Marine Corps, falls under the Department of the Navy for administrative and headquarters functions. *See generally* 10 U.S.C. §§ 3001–9842 (2012).

13 U.S. DEP'T OF ARMY, FIELD MANUAL 1, THE ARMY § 1-2 (2005), *available at* http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/fm1_0.pdf [hereinafter FM 1].

These obligations are part of what Colin Powell infamously referred to as the "Pottery Barn Rule:" if you break a country, you own it.[14] This Article argues the failure of the U.S. military to adequately plan for and execute post-conflict environmental cleanup violates the obligations it assumes when entering contingency operations and largely undermines its efforts to achieve lasting victory. The ad hoc, slapdash method used by the U.S. military to address environmental damage is largely the result of inadequate leadership and training and outdated policies which ignore the long-term nature of modern contingency and stabilization operations. The failure to acknowledge and attend to environmental damage in these areas not only endangers the civilian populations it seeks to support, but also threatens U.S. personnel and U.S. standing as a world leader as well.

This Article examines U.S. military obligations with respect to cleaning up and mitigating environmental damage and destruction wrought by U.S. military deployments to foreign countries, both during and after combat. Part II outlines current environmental issues in conflict and post-conflict areas, explaining why they are vital to the U.S. national interest. Part III describes the international law and environmental policy for conflict areas. Part IV explores U.S. domestic environmental law and policy governing military matters. Part V examines methods of redress for citizens living in conflict and post-conflict areas. Part VI proposes solutions to current U.S. environmental law and policy governing military operations. Finally, Part VI concludes that the United States has a moral obligation and a national interest in better managing military operations to minimize and remediate environmental degradation.

II. ENVIRONMENTAL HAZARDS IN POST-CONFLICT AREAS

Armed conflict has long been known to cause devastating effects on the environment.[15] Apocryphal stories of the Roman general Scipio salting the earth of Carthage following the Third Punic War in 146 B.C. are but one example of environmental destruction in warfare.[16] In 2009, the United Nations (U.N.) declared, "[t]he toll of warfare today reaches far beyond human suffering, displacement and damage to homes and infrastructure. Modern conflicts also cause extensive destruction and degradation to the environment."[17] In addition to physical destruction by bombs and other munitions, UXO and other hazardous substances released as a consequence

14 *See* David Samuels, *A Conversation with Colin Powell*, THE ATLANTIC, Apr. 2007, http://www.theatlantic.com/magazine/archive/2007/04/a-conversation-with-colin-powell/305873/ (last visited Feb. 14, 2015) (featuring Mr. Powell's theory that when a government takes down a regime it becomes that government and assumes associated responsibilities).

15 LEE DAVIS, ENVIRONMENTAL DISASTERS: A CHRONICLE OF INDIVIDUAL, INDUSTRIAL, AND GOVERNMENTAL CARELESSNESS 203 (1998).

16 GEORGE RIPLEY, THE NEW AMERICAN CYCLOPEDIA: A POPULAR DICTIONARY OF GENERAL KNOWLEDGE 497 (1863).

17 U.N. ENV'T PROGRAMME, PROTECTING THE ENVIRONMENT DURING ARMED CONFLICT: AN INVENTORY AND ANALYSIS OF INTERNATIONAL LAW 8 (2009), *available* at http://www.un.org/zh/events/environmentconflictday/pdfs/int_law.pdf [hereinafter PROTECTING THE ENVIRONMENT].

of war can cause environmental damage "beyond the borders of conflict-affected countries [and] threaten the lives and livelihoods of people well after peace agreements are signed."[18]

Recent conflicts in Iraq, Afghanistan, Bosnia, and Kosovo magnified the issue of environmental damage in warfare, where long-term deployments in-theater became the norm as the United States sought to rebuild and stabilize these countries while simultaneously defeating enemy combatants.[19] Longer military deployments meant more interaction with local populations as well as more opportunities to create hazards affecting those populations. A constant refrain of U.S. commanders during contingency operations is the need to win the "hearts and minds" of civilians in conflict areas,[20] populations that are often both poor and dependent on the land for their livelihood.[21] As a result, stewardship of the environment by the U.S. military, particularly in regard to UXO, depleted uranium, and handling and disposal of hazardous substances, impacts how the local population views U.S. military operations.[22] The following paragraphs discuss the size and scope of these issues, and current U.S. efforts to address them.

A. UXO As an Environmental Hazard

During World War II, massive Allied aerial bombing dropped more than 1.9 million tons of bombs on German soil, killing an estimated 500,000 people.[23] Most experts agree between 5% and 15% of these bombs did not explode, with an estimated 95,000 to 285,000 tons of munitions still dotting the German countryside.[24] The grave and long-lasting environmental consequences of UXO are dire in Germany where WWII ordnance continues to maim and kill.[25]

Unlike Germany, nearly 40% of the Afghan population lives in poverty.[26] Beginning with the Soviet occupation in 1979, thousands of tons of ordnance

18 *Id.*

19 DAVID E. MOSHER ET AL., GREEN WARRIORS: ARMY ENVIRONMENTAL CONSIDERATIONS FOR CONTINGENCY OPERATIONS FROM PLANNING THROUGH POST-CONFLICT 10–11 (2008) [hereinafter GREEN WARRIORS].

20 Jason Lyall, *How Hard Is It to Win Hearts and Minds in Afghanistan? Very Hard.*, WASH. POST, Jan. 6, 2014, http://www.washingtonpost.com/blogs/monkey-cage/wp/2014/01/06/measuring-hearts-and-minds-in-afghanistan (last visited Feb. 14, 2015) (internal quotation marks omitted).

21 *See* Cent. Intelligence Agency, *The World Factbook*: *Afghanistan*, https://www.cia.gov/library/publications/the-world-factbook/geos/af.html (last visited Feb. 14, 2015) (stating that 78.6% of Afghanistan's labor force is employed in agriculture and 36% of the country is below the poverty line).

22 *See infra* note 156 and accompanying text.

23 David Crossland, *Unexploded Bombs in Germany: The Lethal Legacy of World War II*, SPIEGEL ONLINE, Oct. 14, 2008, http://www.spiegel.de/international/germany/unexploded-bombs-in-germany-the-lethal-legacy-of-world-war-ii-a-584091.html (last visited Feb. 14, 2015).

24 *Id.*

25 *Id.*

26 *See* Cent. Intelligence Agency, *supra* note 21 (noting that 36% of Afghanis live below the poverty line).

have fallen on Afghanistan.[27] Even before the U.S. invasion in 2001, the Department of Defense estimated between ten and thirty million landmines littered the Afghan countryside, a legacy of previous wars with the Soviet Union and Taliban.[28] According to the U.N., "[m]ines and explosive remnants of war . . . affect a significant number of Afghan communities: 4,681 minefields and 192 battlefield areas threaten the lives and livelihoods of 1,655 Afghan communities in the country.[29] Over 670,000 Afghans—3% of the population—live within 500 meters of contaminated areas."[30] UXO severely hinder agriculture, which comprises 78.6% of Afghanistan's labor force.[31] The Centers for Disease Control observed that "[m]ines [in Afghanistan] often are laid around objects of economic importance . . . resulting in injuries among persons who are traveling or performing activities of economic necessity."[32] Because of their tendency to be found above ground, "UXO pose a particular threat to children and adolescents who like to play or tamper with strange objects" resembling toys or even aid packages.[33] As a result, mines and explosive remnants of war injured or killed an average of thirty-nine civilians a month in Afghanistan in 2013.[34]

The U.S. contribution to this toll accelerated in recent years due to the shutdown of U.S. base camps with firing ranges peppered with deadly explosives.[35] By April 2014, the United States withdrew from a majority of its 880 bases in Afghanistan; however at that point less than 3% of formerly U.S. occupied land had been cleared of munitions.[36] Though U.S. officials say they intend to clean up discarded munitions, none of the estimated $250 million cost has been approved for the effort, which is expected to take two to five years.[37]

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27 Kevin Sieff, *A Rising Number of Children Are Dying from U.S. Explosives Littering Afghan Land*, WASH. POST, Apr. 9, 2014, http://www.washingtonpost.com/world/a-rising-number-of-children-are-dying-from-us-explosives-littering-afghan-land/2014/04/09/dea709ae-b900-11e3-9a05-c739f29ccb08_story.html (last visited Feb. 14, 2015).

28 Steve Lohr, *Moscow's Millions of Deadly Seeds*, N.Y. TIMES, Mar. 2, 1989, http://www.nytimes.com/1989/03/02/world/moscow-s-millions-of-deadly-seeds-afghan-mines.html (last visited Feb. 14, 2015).

29 U.N. MINE ACTION SERVICE, ANNUAL REPORT 44 (2013) [hereinafter U.N. MINE ACTION SERV.], *available at* http://www.mineaction.org/sites/default/files/publications/UNMAS%202013%20Annual%20Report%20Digital%20Presentation.pdf.

30 *Id.*

31 RICHARD MOYES ET AL., EXPLOSIVE REMNANTS OF WAR: UNEXPLODED ORDNANCE AND POST-CONFLICT COMMUNITIES 55 (2002) (explaining that UXO may impede agriculture); Cent. Intelligence Agency, *supra* note 21 (stating that 78.6% of Afghanistan's labor force works in agriculture).

32 Ctrs. for Disease Control & Prevention, *Injuries Associated with Landmines and Unexploded Ordnance—Afghanistan, 1997–2002*, Sept. 12, 2003, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5236a2.htm (last visited Feb. 14, 2015).

33 *Id.*

34 U.N. MINE ACTION SERV., *supra* note 29.

35 *See* Sieff, *supra* note 27 (discussing how the United States closed many base camps without crafting a plan for removal of UXO even though many of these areas are "peppered with explosives").

36 *Id.*

37 *Id.*

This oversight has proven especially deadly for children, who often search former ranges for pieces of scrap metal they can sell.[38] In some instances the children attempt to remove aluminum from ordnance fuses, commonly found in mortar shells by striking live rounds with a large hammer.[39] Another common practice is removing copper driving bands from artillery and tank rounds by laying the rounds in a fire in order to expand the copper band with heat, making it easier to remove.[40] If the round does not explode, young scavengers will use a hammer to strike the bands and remove them.[41] The consequences of this scavenging are often tragic, including catastrophic amputation or even death.[42] Abdul Mateen, the brother of a twelve-year-old Afghan boy maimed by explosives, poignantly stated: "What can he do without legs? . . . . His future is hopeless."[43]

Abdul Mateen's brother is not an isolated case: according to the U.N. in 2013, out of a total of 343 casualties caused by UXO, 284 victims or 83% were children.[44] Between 2012 and April 2014, eighty-four casualties were recorded in and around United States' or North Atlantic Treaty Organization's (NATO) firing ranges or bases.[45] *The Washington Post* observes, "[o]f the casualties recorded by the United Nations [since 2012], 88 percent were children."[46] U.S. officials say they will deal with the firing ranges eventually.[47] Nonetheless, the same officials categorically deny any legal or moral responsibility to clear remnants of UXO from the 240 high explosives ranges used in Afghanistan, stating there is no legal obligation to do so because Afghanistan is not part of the U.N. Convention on Certain Conventional Weapons.[48]

This stance is surprising when one considers the differences between how unused munitions are handled in the United States versus how they are handled in Afghanistan. In the United States, unused munitions are considered hazardous waste when abandoned (for example, buried, placed in landfills, or dumped at sea), detonated (except as a consequence of intended use), burned, incinerated, or treated before disposal; removed from storage for treatment or disposal; deteriorated or damaged beyond repair;

38 MOYES ET AL., *supra* note 31, at 10, 37–38 (illustrating the danger of collecting UXO when people gather scrap metal).

39 *See, e.g.*, *id.* at 38 (discussing an Afghan child's attempt to remove aluminum from a fuse and the common removal technique of using a hammer).

40 *Id.*

41 *Id.*

42 *See id.* (discussing being killed or maimed as consequences to battlefield scavenging).

43 Sieff, *supra* note 27 (internal quotation marks omitted).

44 U.N. ASSISTANCE MISSION IN AFG., AFGHANISTAN ANNUAL REPORT 2013: PROTECTION OF CIVILIANS IN ARMED CONFLICT 64 (2014).

45 *See* Sieff, *supra* note 27 (discussing that the United Nation's Mine Action Coordination Center recorded 70 casualties but The Washington Post found an additional 14 casualties).

46 *Id.*

47 *Id.*

48 *Id.*

recycled or reused; or declared as waste by an authorized military official.[49] In response to section 107 of the Federal Facility Compliance Act of 1992, EPA changed its rules under the Resource Conservation and Recovery Act of 1976 (RCRA)[50] to require specific procedures for storage, transport, and disposal of unused munitions as hazardous waste when they fall into the above categories.[51] A munition is not considered a hazardous waste when "[u]sed for its intended purpose, including . . . training."[52] Therefore, what may be considered hazardous waste in one country can simply be abandoned in another country.

The issue of environmental contamination from UXO on U.S. ranges continues to worsen as U.S. military personnel leave Afghanistan. As troop numbers decline there are fewer uniformed personnel or contractors to survey contaminated sites and to provide security for nongovernmental organizations (NGOs) and contractors participating in demining activities.[53] Though a limited number of Afghan National Army personnel have been trained on explosive ordnance disposal techniques,[54] as one of the poorest countries in the world, Afghanistan lacks the manpower, equipment, and financial resources to deal with the problem.[55]

An additional environmental hazard posed by U.S. munitions comes from the use of cluster bombs, both in Iraq and Afghanistan. Cluster bomb units "consist of a great number of small, but extraordinarily powerful [bomblets] contained within a large canister or dispenser."[56] These bomblets are contained in canisters "designed to break apart in flight and distribute the submunitions or bomblets over a wide area."[57] Cluster bomb units are used by the United States as "area weapons," primarily targeting "soft" targets such as personnel rather than "hard targets" such as tanks,[58] because

49 *See* Military Munitions Rule, 62 Fed. Reg. 6621 (Feb. 12, 1997) (codified at 40 C.F.R. § 266.202(b) (2013)) (identifying when conventional and chemical military munitions become hazardous waste).

50 42 U.S.C. §§ 6901–6992k (2012) (amending Solid Waste Disposal Act, Pub. L. No. 89-272, 79 Stat. 992 (1965)).

51 *Id.* § 260.203–.206 (stating the technical standards for the storage, transport, and disposal of hazardous waste).

52 *Id.* § 260.202.

53 *See* Sieff, *supra* note 27.

54 Staff Sergeant Brian Buckwalter, Int'l Security Assistance Force, *Afghan Soldiers Learn Advanced EOD Techniques, Prepare for Real-World Missions*, http://www.isaf.nato.int/article/news/afghan-soldiers-learn-advanced-eod-techniques-prepare-for-real-world-missions.html (last visited Feb. 14, 2015).

55 *See* CIA Factbook, *supra* note 21 (noting that Afghanistan is one of the poorest nations in the world).

56 Robert M. Augst, *Environmental Damage Resulting from Operation Enduring Freedom: Violations of International Law?*, 33 ENVTL. L. REP. 10,668, 10,669 (2003); *see also* Fed'n of Am. Scientists, Military Analysis Network, *CBU-87/B Combined Effects Munitions (CEM) BLU-97/B Combined Effects Bomb (CEB) (1999)*, http://www.fas.org/man/dod-101/sys/dumb/cbu-87.htm (last visited Feb. 14, 2015) (noting that during Operation Desert Storm the U.S. Air Force dropped 10,035 CBU-87s over the Persian Gulf) [hereinafter FAS].

57 Michael O. Lacey, *Cluster Munitions: Wonder Weapon or Humanitarian Horror?*, ARMY LAW., May 2009, at 28.

58 Augst, *supra* note 56, at 10,668–69, 10,672 (internal quotation marks omitted).

they are "very effective against troops in the open."[59] During Operation Desert Storm, over 61,000 cluster munitions were dropped on Iraqi conventional forces as well as designated military targets.[60] This practice was continued in the Balkans in 1999, in Afghanistan beginning in 2001, and again in Iraq during the 2003 U.S.-led invasion.[61]

Cluster munitions are a particularly insidious hazard. In addition to failing between 5% and 7% of time,[62] cluster munitions are dispersed over a wide area,[63] usually close to civilian population centers.[64] Unlike self-destructing landmines, cluster bombs failing to go off on delivery or impact may blow up at any time, "even years after their initial attempted use."[65] As time passes cluster bombs initially failing to detonate on impact grow even more dangerous as the fuse mechanism, which arms the munitions, deteriorates.[66] Furthermore, due to their design, color, and size—approximately that of a soda can, with a parachute attached—the bomblets resemble toys, which local children pick up, often resulting in death or amputation.[67] Of the 331 known areas where aerial ordnance was dropped on the Taliban, U.S. officials state they have no obligation to clear sites of unexploded cluster munitions bomblets.[68]

Beyond the immediate impact of demise and dismemberment, UXO can render once habitable or arable land uninhabitable for decades:

> Assuming a fairly standard strike of five [cluster bomb dispensers with 147 bomblets each], the resulting 35 unexploded bomblets may have a post-conflict impact ranging from insignificant to devastating. Thirty-five bomblets spread across the agricultural and grazing land of a subsistence community could effectively destroy its future and force it to abandon its homes and land. [A community] has no way of knowing that there are 'only' 35 bomblets present

59 *See* Lacey, *supra* note 57.

60 Human Rights Watch, *Ticking Time Bombs: NATO's Use of Cluster Munitions in Yugoslavia, III. What Are Cluster Bombs? Widespread Cluster Bomb Use in the Gulf War*, http://www.hrw.org/reports/1999/nato2 (last visited Feb. 14, 2015).

61 *Id.* (acknowledging the use of cluster bombs has led to a large number of human casualties); HUMAN RIGHTS WATCH, CLUSTER BOMBS IN AFGHANISTAN (2001), *available at* http://www.hrw.org/legacy/backgrounder/arms/cluster-bck1031.pdf; Kamal Ahmed, *Revealed: The Cluster Bombs That Litter Iraq*, THE GUARDIAN, May 31, 2003, http://www.theguardian.com/world/2003/jun/01/iraq.foreignpolicy1 (last visited Feb. 14, 2015).

62 Ron Laurenzo, *Cluster Bomb Dud Rates Cut, Army Says*, DEF. WKLY., June 1, 1999, at 3.

63 Human Rights Watch, *supra* note 60.

64 HUMAN RIGHTS WATCH, CLUSTER BOMBS IN AFGHANISTAN: A HUMAN RIGHTS WATCH BACKGROUNDER 1 (2001) [hereinafter CLUSTER BOMBS IN AFGHANISTAN], *available at* http://www.hrw.org/legacy/backgrounder/arms/cluster-bck1031.pdf.

65 Thomas Michael McDonnell, *Cluster Bombs over Kosovo: A Violation of International Law?*, 44 ARIZ. L. REV. 31, 80 (2002).

66 *See* RAE MCGRATH, CLUSTER BOMBS: THE MILITARY EFFECTIVENESS AND IMPACT ON CIVILIANS OF CLUSTER MUNITIONS, UK WORKING GROUP ON LANDMINES 27 (2009), *available at* http://www.academia.edu/2341130/Cluster_Bombs_The_military_effectiveness_and_impact_on_civilians_of_cluster_munitions (discussing the failure of cluster bombs, and how they lead to civilian casualties).

67 Laurenzo, *supra* note 62, at 42.

68 Sieff, *supra* note 27.

> nor would it have any reasonable expectation of the land being cleared within a feasible timescale.[69]

The presence or potential presence of UXO also prevents people from "safely using land for agriculture and infrastructure, for example collecting wood, growing cash crops, and rebuilding houses. . . . [T]he economy of the family and the wider community is affected."[70] Though land denial from UXO is "not always absolute," clearly the economic impact on subsistence communities like those of Iraq and Afghanistan is profound, especially for families lacking nonfarming skills.[71] In its most extreme form, contamination can be so pervasive that many families choose to abandon land rather than expose themselves and their children to risk.[72] Secondary impacts of UXO include disease outbreaks amongst refugees fleeing impacted areas, malnutrition, and starvation due to lack of cultivation of these lands, which now lie fallow.[73]

B. Release of Hazardous Substances

UXO is not the only way war damages the environment. Deliberate targeting of industrial and "dual use" sites—meaning those used for both military and civilian purposes—and collateral damage to the surrounding areas devastates the environment over and over again. In 1999, NATO targeted the Pancevo Industrial Complex in Serbia with airstrikes, releasing "2,100 tons of Ethylene Dicholoride . . . , eight tons of metallic mercury, 460 tons of vinyl chloride monomer . . . , 80,000 tons of oil and oil products and 250 tons of liquid ammonia."[74] Though spared from the worst environmental effects due to prevailing winds carrying toxins away from the city, the citizens of Pancevo still suffered from "respiratory difficulties, burning eyes, choking sensations and upset stomachs."[75] In one instance a doctor reportedly advised all of his pregnant patients to have abortions due to fears over birth defects resulting from chemical exposure.[76] Damage to storage tanks in Novi Sad released 70,000 tons of crude oil into the soil and groundwater, while in Kragujevac 2,500 kilograms of polychlorinated

69 MCGRATH, *supra* note 66, at 7.

70 MOYES ET AL., *supra* note 31, at 8–9.

71 *Id.* at 9.

72 *See id.*

73 Indian Inst. of Peace, Disarmament and Envtl. Prot., Nagpur, India & Global Green Peace, Srinagar, Jammu & Kashmir, India at Srinagar, India, *Landmines—Challenges to Humanity & Env't Convention, Impact of War and Landmines on Environment* ¶¶ 29, 33–38 (Apr. 20, 2013), *available at* http://lib.icimod.org/record/11218/files/1409.pdf.

74 Mark D. Sameit, *Killing and Cleaning in Combat: A Proposal to Extend the Foreign Claims Act to Compensate for Long-Term Environmental Damage*, 32 WM. & MARY ENVTL. L. & POL'Y REV. 547, 567–68 (2008).

75 Uli Schmetzer, *Serbs Allege Nato Raids Caused Toxic Catastrophe*, CHI. TRIB., July 8, 1999, http://articles.chicagotribune.com/1999-07-08/news/9907080418_1_nato-spokesmen-nato-strikes-yugoslav-army (last visited Feb. 14, 2015).

76 Sameit, *supra* note 74, at 568.

biphenyls were released from damaged transformers into the Lepenica River.[77]

More recently, during Operation Desert Storm, U.S. planes targeted industrial sites in Iraq including pharmaceutical and fertilizer plants due to their potential use in chemical weapons manufacturing and storage.[78] Destruction of the Iraqi power grid by U.S. aerial bombing resulted in serious damage to already-inadequate water and sewage systems.[79] While the targeting of military sites is to be expected, U.N. observers found "[m]any of these attacks achieved the military objective of denying the Iraqi military arms and other support; however, these attacks were also associated with releases into the environment."[80]

Coalition bombers targeted industrial sites, some of which were located near facilities such as water treatment plants.[81] These targeted industrial sites cover over 100 square kilometers, and these attacks have resulted in extensive damage.[82] Desperate Iraqi nationals pillaged these sites following the bombing.[83] Inspectors later found the areas "derelict and comprehensively looted. Liquid and solid waste wastes including mounds of pure cyanide compounds remain[ed] on site and open to public access."[84] Especially concerning to the inspectors were residents exposed to "solvents, concentrated cyanides, acids, caustics and chromium compounds" once used in metalworking.[85]

Some observers believe the U.S failure to secure nuclear sites within Iraq following the aerial campaign resulted in lasting environmental damage.[86] The al-Tuwaitha nuclear research complex, thirty miles south of Baghdad, was thought to be the headquarters of Iraq's nuclear weapons program.[87] International Atomic Energy Agency inspectors visiting the site after several months of U.S. occupation found "metal containers of 300–400 kilograms of natural and low-enriched uranium and uranium oxide . . . either stolen or tipped out and [that] the containers [were] used for domestic purposes, such as milking cows, washing clothes, and storing drinking water

77 U.S. ARMY ENVTL. POL'Y INST., REVIEW OF UNITED NATIONS ENVIRONMENT PROGRAMME AND OTHER POST-CONFLICT ENVIRONMENTAL ANALYSES 20 (2009) [hereinafter UNEP REVIEW].

78 U.N. ENV'T PROGRAMME, UNEP IN IRAQ: POST-CONFLICT ASSESSMENT, CLEAN-UP, AND RECONSTRUCTION 21 (2007) [hereinafter UNEP IN IRAQ].

79 UNEP REVIEW, *supra* note 77, at 37.

80 *Id.*

81 *See* UNEP IN IRAQ, *supra* note 78, at 21 (discussing a March 2003 air strike on an Iraqi industrial site near the Al Rasheed water treatment plant).

82 *See* U.N. ENV'T PROGRAMME, ASSESSMENT OF ENVIRONMENTAL "HOT SPOTS" IN IRAQ 46, 128 (2005) [hereinafter IRAQ HOT SPOTS] (identifying the size of some of these sites and the extensive damage caused by attacks on oil pipelines).

83 *See, e.g.*, *id.* at 48 (showcasing specific examples of looting that occurred in the agricultural, chemical, and steel industries).

84 *Id.* at 46.

85 *Id.*

86 Andy Oppenheimer, *A Sickening Episode: Nuclear Looting in Iraq and the Global Threat from Radiological Weapons*, THE ACRONYM INST., Oct.–Nov. 2003, http://www.acronym.org.uk/dd/dd73/73op03.htm (last visited Feb. 14, 2015).

87 *Id.*

and food."[88] Some radioactive material at the site dispersed through broken windows, while other material flowed into the Tigris because Iraqis used river water to clean out the drums.[89]

In Afghanistan, the U.S. bombing campaign during the opening stages of Operation Enduring Freedom damaged Kabul's main water supply networks, resulting in severe water shortages contributing to a cholera outbreak.[90] One study of Coalition aerial bombing in Afghanistan found the attacks caused environmental damage, which "increased the number of internally displaced persons by approximately 360,000 and prompted 200,000 others to flee to neighboring countries."[91] Some estimates found 2,500 people residing in U.N. refugee camps in Afghanistan following these attacks died "from starvation, exposure, and associated illnesses during a four-month period."[92]

C. Depleted Uranium

Another way recent wars impacted the environment is the dispersal of depleted uranium (DU), which is a byproduct of uranium enrichment and used in armor-piercing munitions such as anti-tank rounds, tank armor, missiles, and projectiles.[93] DU is approximately 40% as radioactive as naturally occurring uranium.[94] The advantage of DU munitions over standard ammunition is its "high density, its ability to self-sharpen as it penetrates its target, and its propensity to ignite on impact at temperatures exceeding 600 degrees centigrade."[95] Combatants and civilians alike are exposed to DU when it pulverizes upon impact, either from a fired DU round or a damaged vehicle such as a "Humvee" with DU plating.[96] Upon impact, particles of DU are aerosolized, allowing them to be "inhaled, ingested, or absorbed through dermal contact or injury."[97] An additional hazard posed by DU is its deterioration to powdered uranium oxide, which when dispersed as a dust

88 *Id.*

89 *Id.*

90 Int'l Comm. of the Red Cross, *Afghanistan: ICRC Activities in Facts and Figures*, https://www.icrc.org/eng/resources/documents/update/57jrlu.htm (last visited Feb. 14, 2015); *see* Tara Rava Zolnikov, *The Maladies of Water and War: Addressing Poor Water Quality in Iraq*, 103 AM. J. PUB. HEALTH, at e1, e2 (2013) (discussing the ability of water to dissolve and redistribute harmful bacteria).

91 Augst, *supra* note 56, at 10,671.

92 *Id.* (citing Carl Concetta, *Strange Victory: A Critical Appraisal of Operation Enduring Freedom and the Afghanistan War*, PROJECT ON DEF. ALT., Jan. 30, 2002, at 36, http://www.comw.org/pda/0201strangevic.html (last visited Feb. 14, 2015)).

93 Dr. Michael H. Repacholi, *Background Material on Depleted Uranium (DU)*, http://www.nato.int/du/docu/d010108e.htm (last visited Feb. 14, 2015).

94 *Id.*

95 SPECIALISTS IN RADIATION SAFETY, HEALTH PHYSICS SOC'Y, DEPLETED URANIUM 1 (2010), *available at* https://hps.org/documents/dufactsheet.pdf [hereinafter HEALTH PHYSICS SOC'Y].

96 Scott Peterson, *Remains of Toxic Bullets Litter Iraq*, CHRISTIAN SCI. MONITOR, May 15, 2003, at 7–8; Augst, *supra* note 56, at 10,675–76. "Humvee" is the colloquial name for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) used by U.S. soldiers. *HMMWV*, MERRIAM-WEBSTER DICTIONARY, http://www.merriam-webster.com/dictionary/hmmwv (last visited Feb. 14, 2015).

97 Augst, *supra* note 56, at 10,675.

can be inhaled, absorbed, or ingested.[98] During the 1991 Gulf War, "[o]ver 290 metric tons of depleted uranium projectiles were fired into Iraq."[99] Operation Iraqi Freedom added an estimated 1,100 to 2,200 tons of DU to the environment from 2003 to 2009.[100]

The amount of actual physical harm caused by DU rounds and other scrap waste is the subject of much controversy. Early studies of the material by the United Kingdom's Ministry of Defense found exposure to DU increased the risk of lung, lymph, and brain cancer.[101] A 2005 epidemiological survey concluded, "[i]n aggregate the human epidemiological evidence is consistent with increased risk of birth defects in offspring of persons exposed to DU."[102] Reporters surveying impact sites near Iraqi tanks hit with DU rounds claimed to have measured radiation levels from 300 to 1,000 times the normal background levels, though these results have not been replicated.[103] Others attributed the puzzling constellation of symptoms known as "Gulf War syndrome" to exposure to burning vehicles and DU rounds.[104]

Nonetheless, the U.S. Department of Defense (DOD), NATO, and the Health Physics Society (HPS)—an organization that specializes in radiation safety—dispute these findings.[105] According to HPS, DU is generally considered a chemical, rather than a radiological, threat, primarily affecting the kidneys.[106] The HPS's factsheet on DU states the material can potentially become a radiation hazard when "inhaled in the form of tiny insoluble particles, which lodge in the lungs and remain there for very long times."[107] The United Nations Environmental Programme (UNEP) describes DU as: "a chemical hazard as it is moderately toxic—approximately the same as other heavy metals such as lead. It also presents a low-level radioactive hazard."[108]

98 IRAQ HOT SPOTS, *supra* note 80, at 115, 120.

99 Hassan Partow, *Environmental Impact of Wars and Conflicts*, *in* ARAB ENVIRONMENT: FUTURE CHALLENGES 159, 164 (Mostafa K. Tolba & Najib W. Saab eds., 2008), *available at* http://www.afedonline.org/afedreport/full%20english%20report.pdf.

100 ABDUL-HAQ AL-ANI & JOANNE BAKER, URANIUM IN IRAQ: THE POISONOUS LEGACY OF THE IRAQ WARS 95 (2009).

101 Richard Norton-Taylor, *MoD Knew Shells Were Cancer Risk*, THE GUARDIAN, Jan. 11, 2001, http://www.theguardian.com/uk/2001/jan/11/armstrade.world?intcmp=ilcnettxt3487 (last visited Feb. 14, 2015).

102 Rita Hindin et al., *Teratogenicity of Depleted Uranium Aerosols: A Review from an Epidemiological Perspective*, 4 ENVTL. HEALTH, 4:17 (2005), http://www.ehjournal.net/content/4/1/17 (last visited Feb. 14, 2015).

103 Peterson, *supra* note 93, at 1, 8–9.

104 CHRIS BUSBY, EUROPEAN COMM. ON RADIATION RISK, URANIUM, AND HEALTH: THE HEALTH EFFECTS OF EXPOSURE TO URANIUM AND URANIUM WEAPONS FALLOUT 12 (2010).

105 *See* HEALTH PHYSICS SOC'Y, *supra* note 95, at 2 ("[T]here is no known association between low-level DU exposure and adverse health effects.").

106 *Id.*

107 *Id.* (emphasis omitted).

108 IRAQ HOT SPOTS, *supra* note 82, at 115.

D. Burn Pits

A third source of environmental damage in war zones derives from the disposal of military hardware and other day-to-day wastes generated by personnel occupying U.S. Forward Operating Bases (FOBs) and Contingency Operations Basis (COBs).[109] According to DOD, the occupations of Iraq and Afghanistan generated about ten pounds of solid waste per servicemember per day.[110] Disposal methods for solid waste range from burying drums of hazardous waste to local commanders spilling waste oil directly into local lakes and sewers.[111] The most notorious method of waste disposal is the use of open burn pits.[112]

Beginning in 2001 in Iraq and 2003 in Afghanistan, COBs and FOBs heavily relied upon burn pits as a means of waste management.[113] Originally designed as a temporary measure in a contingency environment, burn pits were ubiquitous by 2010, "located at dozens of bases throughout Iraq and Afghanistan."[114] A 2009 Government Accountability Office (GAO) report found that in spite of U.S. Central Command (CENTCOM) regulations to the contrary, the military continued to burn prohibited items, producing plumes of toxic smoke affecting soldier and civilian alike.[115] A *New York Times* article noted: "Every conceivable type of waste was piled high in the pit—plastics, batteries, appliances, medicine, dead animals, even human body parts—and burned, with a dousing of jet fuel."[116]

Though DOD admits "[s]moke exposure [from burn pits] may cause acute symptoms in some people," it asserts "[m]ost short-term effects from exposure to particulate matter and burn pit smoke resolve after the

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109 A Forward Operating Base (FOB) is loosely defined as a base used to support tactical operations without establishing full support facilities. The base may be used for an extended time period. Support by a main operating base will be required to provide backup support for a forward operating base. U.S. DEP'T OF DEF., JOINT DOCTRINE ENCYCLOPEDIA 300, *available at* http://www.bits.de/NRANEU/others/jp-doctrine/jp-encyclop%2897%29.pdf. A Contingency Operating Base (COB) is usually occupied by an element larger than Brigade Combat Team size, from a single service or joint services, and is generally a command and control hub or a regional logistics hub; characterized by advanced infrastructure for facilities and communications for the expected duration of the operations. *See* U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-11-77, IRAQ DRAWDOWN (2011), *available at* http://www.gao.gov/new.items/d11774.pdf.

110 U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-11-63, AFGHANISTAN AND IRAQ: DOD SHOULD IMPROVE ADHERENCE TO ITS GUIDANCE ON OPEN PIT BURNING AND SOLID WASTE MANAGEMENT 1 (2010) [hereinafter GAO REPORT 11-63].

111 Kelly Kennedy, *Report: Army Making Toxic Mess in War Zones*, ARMY TIMES, Oct. 2, 2008, http://www.armytimes.com/article/20081002/NEWS/810020318/Report-Army-making-toxic-mess-war-zones (last visited Feb. 14, 2015).

112 *See* GAO REPORT 11-63, *supra* note 110 (discussing the use of open burn pits).

113 *Id.* at 8.

114 *See* Sean Dobbin, *Military Burn Pit Claims in Limbo*, USA TODAY, Oct. 20, 2013, http://www.usatoday.com/story/news/nation/2013/10/20/troops-civilians-in-limbo-over-military-burn-pits/3087659 (last visited Feb. 14, 2015).

115 *See* GAO REPORT 11-63, *supra* note 110, at 13 (noting that "a senior DOD official" had reported that prohibited items were routinely burned in violation of the regulations).

116 James Risen, *Veterans Sound Alarm Over Burn-Pit Exposure*, N.Y. TIMES, Aug. 7, 2010, http://www.nytimes.com/2010/08/07/us/07burn.html.

individual leaves the deployed area."[117] This differs from a now-infamous memorandum drafted by Air Force Lieutenant Colonel Darrin Curtis, a bioenvironmental officer at Joint Base Balad in Iraq. The memorandum asserts that the burn pit at Balad was an "acute health hazard for individuals," and that "[i]t is amazing that the burn pit has been able to operate without restrictions over the past few years without significant engineering controls."[118] Lieutenant Colonel James Elliot, Chief of the Aeromedical Services, also stated "the known carcinogens and respiratory sensitizers released into the atmosphere by the burn pit present both an acute and a chronic health hazard to our troops and the local population."[119]

At larger FOBs, private contractors hired by the DOD, most notably Kellogg, Brown & Root (KBR), largely handled waste disposal in order to allow uniformed personnel to perform other missions.[120] In 2008, Joshua Eller, a civilian computer-aided drafting technician deployed to Balad with the 332nd Air Expeditionary Wing, filed suit against KBR and its former parent company, Halliburton, claiming it had negligently handled waste disposal at the Balad burn pit.[121] Thousands of servicemembers and civilians exposed to smoke at burn pits, like the one at Balad, attribute ailments ranging from respiratory infections to Lou Gehrig's disease and cancer to exposure to toxic smoke.[122] One article recounts medical waste being burned in the same pit as other trash, in direct violation of military regulations.[123] Mr. Eller claimed that "[he] witnessed the open air burn pit in operation at Balad Air Force Base [and that on] one occasion he witnessed a wild dog running around base with a human arm in its mouth. The human arm had been dumped on the open air burn pit by KBR."[124] Although such lawsuits received widespread coverage in the press, scant attention was paid to the effect on the local population's exposure and health.[125]

The lack of media attention does not mean the local population is not paying attention. In July 2010, the *Christian Science Monitor* reported on a

117 Katie Drummond, *Ring of Fire: Why Our Military's Toxic Burn Pits Are Making Soldiers Sick*, THE VERGE, Oct. 28, 2013, http://www.theverge.com/2013/10/28/4771164/the-next-agent-orange-why-burn-pits-are-making-soldiers-sick (last visited Feb. 14, 2015) (internal quotation marks omitted).

118 *See generally* Memorandum from Darrin L. Curtis, Dep't of Air Force, to Dep't of Air Force, 332nd Air Expeditionary Wing, Balad Air Base Iraq (Dec. 20, 2006), *available at* http://www.comanchero.org/BaladIraq.pdf.

119 *Id.*

120 Kate Donovan Kurera, *Military Burn Pits in Iraq and Afghanistan: Considerations and Obstacles for Emerging Litigation*, 28 PACE ENVTL. L. REV. 288, 289 (2010).

121 *Id.*; Complaint at 1–2, Eller v. KBR Inc., No. 4:08-CV-03495 (S.D. Tex. 2009), *available at* http://burkepllc.com/files/2011/11/Eller_Complaint.pdf.

122 Dobbin, *supra* note 114.

123 Kelly Kennedy, *Suit Claims Halliburton, KBR Sickened Base*, ARMY TIMES, Dec. 3, 2008, http://www.armytimes.com/article/20081203/NEWS/812030329/Suit-claims-Halliburton-KBR-sickened-base (last visited Feb. 14, 2015).

124 *Id.*

125 *See, e.g.*, Kelly Kennedy, *Burn Pit at Balad Raises Health Concerns*, ARMY TIMES, Oct. 27, 2008, http://www.armytimes.com/article/20081027/NEWS/810270315/Burn-pit-Balad-raises-health-conerns (last visited Feb. 14, 2015) (discussing briefly that burn pits have negative health effects on the local population as well as servicemembers).

tour by Iraqi environmental officials of U.S. hazardous waste management sites in Iraq.[126] This tour was provided in response to a *London Times* article alleging U.S. military contractors dumped fifty-five gallon drums of engine oil.[127] U.S. forces generated an estimated 11,000,000 pounds of hazardous waste that was "allegedly . . . mixed with recyclable materials and sent from U.S. bases to Iraqi scrap yards."[128] Iraqi scrap dealers handling the waste developed skin lesions and rashes, while others attributed gagging and coughing to the U.S. waste.[129] Though Iraqi officials on the tour expressed satisfaction with what they saw of the disposal site, Hikmat Gabriel Gorgess, an engineer with Iraq's Environment Ministry added: "You cannot feel safe through one visit to one site. This [cleanup] site . . . is reassuring, but what about the rest of the sites?"[130] A RAND Corporation study (RAND Study), relating to environmental issues of Operation Iraqi Freedom and Operation Enduring Freedom,[131] later recounted several instances of improper waste management by the U.S. military or military contractors, including failures to properly dispose of insecticides, used vehicle batteries, and petroleum products.[132] The study noted, "[s]oldiers jokingly referred to fuel spills as 'replenishing the oil wells.'"[133]

The RAND Study pointed to organizational and structural deficiencies leading to improper hazardous waste handling in contingency zones.[134] Military officials failed to realistically plan for the long term when setting up COBs and FOBs, leading to an exigency mindset and the failure or complete lack of environmental management:

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126 Scott Peterson, *As Iraq War Winds Down, US Military Cleans Up Hazardous Waste*, CHRISTIAN SCI. MONITOR, July 22, 2010, http://www.csmonitor.com/World/Europe/2010/0722/As-Iraq-war-winds-down-US-military-cleans-up-hazardous-waste (last visited Feb. 14, 2015).

127 Oliver August, *Blisters, Rashes, and Toxic Waste—The US Army's Dirty Little Secret in Iraq*, LONDON TIMES, June 14, 2010, at 12 ("[O]pen acid canisters sit within easy reach of children, and discarded batteries lie close to irrigated farmland.").

128 Sean Alfano, *U.S. Military Turns Iraq into a Toxic Dump of Oil Drums and Acid Cans, Investigation Finds*, N.Y. DAILY NEWS, June 14, 2010, http://www.nydailynews.com/news/world/u-s-military-turns-iraq-toxic-dump-oil-drums-acid-cans-investigation-finds-article-1.179295 (last visited Feb. 14, 2015).

129 August, *supra* note 127, at 12.

130 Peterson, *supra* note 120 (alteration in original).

131 The United States launched Operation Iraqi Freedom on March 20, 2003. The operation's short-term goal was to remove the Iraqi regime, in part to eliminate its ability to employ weapons of mass destruction or to provide them to terrorists. The larger, long-term objective encompassed helping Iraqis build a prosperous and free Iraq. Catherine Marie Dale, Cong. Research Serv., RL34387, Operation Iraqi Freedom: Strategies, Approaches, Results, and Issues for Congress (2008), *available at* http://fpc.state.gov/documents/organization/101771.pdf. Operation Enduring Freedom refers to military operations by the United States launched in response to the September 11, 2001 attacks on the World Trade Center and covers ongoing operations in Afghanistan, operations against terrorist groups in other countries, and providing training support to foreign militaries engaged in counterterrorism operations. Lawrence Kapp, Cong. Research Serv., RL31334, Operations Noble Eagle, Enduring Freedom, and Iraqi Freedom: Questions and Answers About U.S. Military Personnel, Compensation, and Force Structure (2005), *available at* http://www.fas.org/sgp/crs/natsec/RL31334.pdf.

132 GREEN WARRIORS, *supra* note 19, at 202.

133 *Id.*

134 *Id.* at 4.

> The longer a camp is likely to be occupied, the more investment must be made in infrastructure to handle wastes and provide healthy, sanitary conditions for the soldiers who live there. Conditions that will suffice for a few weeks or months can become unacceptable hazards to health and safety if a camp is used for longer periods. Decisions about how much to invest in a base camp are complicated by uncertainty about how many Army forces will remain in the region and how long they will remain, which often leads decision-makers to consider base camps as "temporary" even after they have been occupied for years.[135]

Throughout recent wars this lack of insight resulted in a failure to properly fund and manage environmental hazards including proper waste disposal.[136] "Temporary camps often have trouble getting the equipment they need for environmental support, such as incinerators to burn solid, hazardous, and medical wastes."[137] Lack of funding meant ad hoc, substandard waste disposal methods became routine and habitual.[138] While the U.S. military has a robust network of environmental engineers and managers to support enduring facilities, "[t]he Army organizations charged with managing permanent installations in the United States and overseas have not considered base camps as part of their mission, which means that the commanders in a contingency cannot benefit from the expertise of those organizations in planning or running base camps."[139] Michael Wolford, a member of the U.S. Army Engineer School faculty, surveyed U.S. battalion and brigade commanders on the reasons why they did not properly plan for waste management in theater.[140] The responses ranged from, "[w]e're here to fight a war, not pick up trash," to "[w]e're just passing through and do not have time," to "[w]e're in the desert. What does it matter?"[141]

The responses above reflect a pervasive attitude toward environmental responsibility in combat, one that would not be tolerated at stateside facilities. The typical U.S. military commander in combat focuses on two objectives: 1) accomplishing the mission, and 2) keeping his or her subordinates alive.[142] The following Subpart II.E examines why and how avoiding and mitigating environmental destruction in conflict is important to achieving the goals of mission accomplishment and survivability, how military commanders shortchange themselves by failing to include environmental considerations in wartime planning, and why U.S. law and military policy should include those considerations.

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135 *Id.* at 73 (explaining that often environmental assessments are not done prior to establishing or expanding a camp).

136 *Id.*

137 *Id.* at 73–74.

138 *See id.* at 74 (explaining that surges in population prevent established environmental procedures from being followed).

139 *Id.*

140 Kennedy, *supra* note 111.

141 *Id.*

142 *See* GREEN WARRIORS, *supra* note 19, at 4–5 (noting that commanders do not normally consider environmental issues because they are instead worried about survival of their subordinates and the success of the mission).

E. Why It Matters

In spite of one battalion commander's response to the RAND Study, "[i]f it was important enough for us to do, we would have been told about it before we got here,"[143] the RAND Study did make two major findings in its analysis of U.S. military environmental planning: 1) "[e]nvironmental issues can have a significant impact on operations;" and 2) "[e]nvironmental considerations can be particularly important for success in the post-conflict phase."[144] The perception among many soldiers of concern for the environment being a "tree-hugger thing"[145] fails to properly account for how environmental issues can be both the difference between life and death as well as mission success or failure. One article notes, "if troops can dispose of their waste inside the wire in an environmentally friendly way, they may not have to risk lives going outside the wire to dispose of it."[146] An Army study of sustainability in contingency operations found:

> Sustainability in contingency operations becomes a force multiplier through:
>
> - reduced casualties associated with resource/supply movement,
> - increased operational efficiencies and effectiveness,
> - reduced logistical burdens, and
> - reduced life-cycle costs.
>
> In addition, sustainable operations promote the well-being of soldiers, civilians, and the host nation population through:
>
> - enhancement of the military's relationship to host-nation communities, and
> - avoidance of health hazards and post-event liabilities.[147]

Lieutenant Colonel Garth Anderson, a U.S. Army engineer, spent months studying and critiquing units in Afghanistan on their waste disposal practices.[148] In Kandahar, Afghanistan, he observed U.S. troops creating a burn pit in a pile of debris to dispose of Taliban equipment.[149] "[P]eople tossed in aerosol cans, hazardous waste, petroleum and oil—which could seep into the ground water supply—and medical waste. Smoke hovered over

143 Kennedy, *supra* note 110.
144 GREEN WARRIORS, *supra* note 19, at 121.
145 Kennedy, *supra* note 111.
146 *Id.*
147 KROOKS & KINNEVAN, *supra* note 10, at 1.
148 Kennedy, *supra* note 111.
149 *Id.*

areas where troops slept and worked."[150] What had originally been designed as a temporary method of destroying Taliban equipment and vehicles quickly became a massive safety hazard for U.S. personnel.[151] Lieutenant Colonel Anderson and his team also saw troops spreading gasoline to keep the dust down, a common practice during Desert Storm that could potentially contaminate drinking water.[152] "It's a pretty significant problem," Lieutenant Colonel Anderson said.[153]

Simple practices, such as recycling petroleum, oil, and lubricants products, can pay huge dividends for force protection and soldier health. The RAND Study observed:

> Logistics requirements and costs can be reduced by good practices, for instance, applying technologies to reduce operational requirements for petroleum, oil, and lubricants . . . or field water treatment systems, or reducing acute threats to soldier health. Good environmental practices can also reduce the resources that must be diverted to address environmental issues.[154]

As the burn pit lawsuit against KBR demonstrates, failure to address environmental hazards in a comprehensive manner can also have long-term implications for soldier health and readiness.[155]

Beyond immediate concerns of self-survival and troop health are impacts on local populations that can influence the perceived success or failure of contingency operations. The RAND Study found "[a]lthough environmental conditions may be poor and national environmental laws may be weak or nonexistent, our research indicates locals often care deeply about the environment, which can be critical to their survival, livelihood, and well-being."[156] Commentators argue the lack of environmental regulation in Afghanistan "demonstrated a low valuation placed on environmental quality by Afghans."[157] When RAND analyzed a series of public opinion surveys conducted in Iraq, environmental infrastructure issues—particularly clean drinking water—were ranked as important concerns by nearly 76% of the respondents, followed by sewage and sanitation.[158] Later surveys included questions regarding hazardous waste from military activities, solid waste management, and human-health impacts, all of which were found to be top concerns of Iraqi citizens.[159] Unsurprisingly, like American parents,

150 *Id.*

151 *See id.* (explaining how a burn pit in Kandahar became a safety hazard when a truck caught fire unloading items such as aerosol cans into the pit).

152 *Id.*

153 *Id.*

154 GREEN WARRIORS, *supra* note 19, at 7.

155 *See generally* Kurera, *supra* note 120 (exploring the legal and factual requirements implicated by a lawsuit on the health effects of burn pits in Iraq and Afghanistan).

156 GREEN WARRIORS, *supra* note 19, at 8.

157 Augst, *supra* note 56, at 10,672–73.

158 GREEN WARRIORS, *supra* note 19, at 174.

159 *Id.* at 189.

Afghans and Iraqis want clean drinking water and air for themselves and their children.

As the lines blur between conflict and post-conflict stages of an insurgency, popular support for U.S. forces can largely depend on how quickly environmental concerns are addressed, and on whether or not U.S. forces are seen as contributing to the problem. Whereas conventional wars such as World War I and World War II had a defined end to hostilities marked by peace treaties and signing ceremonies, conflicts today require the U.S. military to simultaneously fight insurgencies while providing humanitarian support and reconstruction activities.[160] In these environments, support of the local population is more important than ever in determining whether or not gains will be substantial and long-lasting. In previous conflicts, NGOs such as the U.N. and International Committee of the Red Cross were able to step in and mitigate the impact of humanitarian crises caused by war; now, with no defined end to hostilities, NGOs are less willing and able to provide humanitarian assistance to address environmental hazards due to lack of security for their personnel, even after the shooting stops.[161]

The RAND Study evaluated over 110 case studies of contingency operations involving an environmental component, and found approximately 60% occurred in the post-conflict phase.[162] It also established potential effects on U.S. military activities in eight key dimensions: impact on health of U.S. soldiers or others; impact on military mission; additional environmental harm; financial cost or savings to the Army; impact on community or diplomatic relations; impact on the safety of U.S. troops; environmental liability; and impact on reconstruction activities.[163] The study found of the 110 case studies, over one-third of environmental issues can affect reconstruction activities, a key component of the U.S. military post-conflict mission set.[164]

Access to basic services largely dependent on environmental issues can affect whether and how much support a post-conflict government gains, which in turn determines how quickly a country will stabilize.[165] In 2004, Major General Peter Chiarelli, commander of the U.S. Army First Cavalry Division, said an analysis by his intelligence officers of insurgent attacks found the insurgency was "strongest in areas with little or no sewer service, faltering electricity and high unemployment."[166] Environmental hazards caused by lack of clean drinking water were particularly important to "'fence sitters,' who with the handover of sovereignty approaching [hadn't] decided

160 *Id.* at 56.

161 *See id.* at 56–57, 99, 111 (explaining that NGOs are staying away from conflict zones due to the inherent dangers).

162 PowerPoint Presentation of Beth Lachman and David Mosher, *Environmental Considerations in Post-Conflict Military Operations and Reconstruction*, at slide 14 (July 27, 2006), *available at* http://www.denix.osd.mil/international/upload/Lachman-Post-Conflict.ppt.

163 *Id.*

164 *Id.*

165 GREEN WARRIORS, *supra* note 19, at 64.

166 Greg Jaffe, *U.S. Offers Iraqis Public-Works Jobs*, WALL ST. J., June 8, 2004, at A4.

whether or not they [would] support the new government or the insurgency."[167] Major General Chiarelli said addressing these deficiencies was important because, "[t]he harder we work to get dollars for these projects, the fewer of my soldiers will get shot at."[168]

Considering natural resources "such as water, soil, trees, and wildlife are the 'wealth of the poor,'" damage to these resources during and post-conflict "can undermine livelihoods, act as a driver of poverty and forced migration, and even trigger local conflict."[169] UNEP found establishing basic services and government,[170] also said to be fundamental to U.S. counterinsurgency strategy in Iraq and Afghanistan, depends on avoiding damage to natural resources and mitigating such damage when damage is unavoidable.[171] The operational importance of addressing such concerns is reflected in Major General Chiarelli's remarks above and on a microlevel in the daily challenges faced by U.S. soldiers. In one example cited by the RAND Study, U.S. soldiers cut down a grove of date palms in Baghdad in order to halt snipers attacking troop movements, even though an alternative route around the date palms would only be slightly longer.[172] Chiarelli expressed concern that such actions would result in locals turning against the Americans and throwing their support to the insurgency due to what they viewed as a needless destruction of an economic and cultural resource.[173]

Beyond winning hearts and minds, good environmental management and protection makes sense for the U.S. military from a financial standpoint. Claims raised by U.S. soldiers, civilians, and contractors exposed to hazardous substances can lead to financial loss, whether in the form of a lawsuit or from having to support a medically discharged soldier and train another to take his or her place.[174] Environmental damage caused by military operations can also cause conflict and diplomatic issues between the United States and nations hosting U.S. forces whose support is critical as a launching platform for force projection. One case involved a country supporting the U.S. war on terrorism, where a local national contracted to haul away POL products chose to dump them in a local landfill and sell the barrels.[175] The claim by the host nation cost the U.S. military $1.25 million in cleanup compensation.[176] What happens when environmental damage occurs and a host nation or local national does not have the leverage or resources to demand compensation or demand mitigation from the U.S. military? Part

167 *Id.*

168 *Id.*

169 PROTECTING THE ENVIRONMENT, *supra* note 17, at 9.

170 *Id.*

171 *See generally* JOINT CHIEFS OF STAFF, JOINT PUBLICATION 3-24, COUNTERINSURGENCY OPERATIONS (2013) (describing the fundamental precepts of counterinsurgency, which include establishing basic services and protecting natural resources for use by the local population).

172 GREEN WARRIORS, *supra* note 19, at 199.

173 *Id.* at 86–87, 199.

174 *Id.* at 8, 86.

175 *Id.*

176 *Id.*

III demonstrates there are very few enforcement mechanisms under international law to compel U.S. forces to resolve these issues.

III. CONVENTIONAL INTERNATIONAL LAW AND CUSTOMARY INTERNATIONAL LAW

In 2010, DOD managed permanent installations in thirty-eight foreign countries, the majority located in Germany (218 sites), Japan (115 sites), and South Korea (86 sites).[177] In countries with permanent DOD facilities, bilateral agreements between the United States and the host nation govern U.S. forces' obligations in addressing environmental harm.[178] For example, GAO found in 1988 that the U.S. military was paying about $28.8 million annually for "maneuver damage" claims in Germany, mostly for damage to roads from military vehicles.[179] The terms of this U.S.–Germany arrangement, established by NATO's Status of Forces Agreement (SOFA), provided "for the settlement of claims for damage allegedly caused by U.S. armed forces in the territory of other member states."[180] However, such agreements rarely exist in contingency environments where the host-nation government is either nonexistent or in transition.[181] Although U.S. federal statutes cover a variety of environmental harms, generally speaking, these laws do not apply extraterritorially.[182] This Part discusses the international law governing U.S. military operations in contingency environments.

International law consists of two basic categories: conventional law and customary international law.[183] Conventional international law covers formal agreements among countries, such as treaties, while customary international law requires the emergence of a general practice so widespread "it carries with it a sense of legal obligation."[184] Customary international law does not bind states consistently rejecting its application.[185] Given there is no hard and fast rule regarding when and how a general practice becomes part of custom international law, there is often ambiguity and inconsistency in its application.[186] Nonetheless, some principles are so widespread and so established as to be generally accepted as part of customary international law.[187] Most commentators agree that conventional international law and

177 U.S. DEP'T OF DEF., BASE STRUCTURE REPORT FISCAL YEAR 2010 BASELINE 9 (2010), *available at* http://www.acq.osd.mil/ie/download/bsr/bsr2010baseline.pdf.

178 GREEN WARRIORS, *supra* note 19, at 21–22.

179 U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-88-191, MANEUVER DAMAGE: DOD NEEDS TO STRENGTHEN U.S. VERIFICATION OF CLAIMS IN GERMANY 2, 19 (1988), *available at* http://www.gao.gov/assets/220/210389.pdf.

180 *Id.* at 1.

181 GREEN WARRIORS, *supra* note 19, at 22.

182 Wynne P. Kelly, Comment, *Citizens Cannot Stand for It Anymore: How the United States' Environmental Actions in Afghanistan and Iraq Go Unchecked by Individuals and Non-Governmental Organizations*, 28 FORDHAM INT'L L.J. 193, 208 (2004).

183 GREEN WARRIORS, *supra* note 19, at 156.

184 *Id.*

185 *Id.*

186 *Id.* at 157.

187 *See id.* at 156.

customary international law carry equal weight in the international community.[188]

A. Conventional International Law

The United States is well known for its reluctance to sign or participate in international treaties and agreements, environmental or otherwise.[189] Nevertheless, some treaties affect how the U.S. military handles environmental issues in contingency environments due to partnerships with other countries who are treaty participants. For example, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal,[190] signed but not ratified by the United States, "places limits on the generation, treatment and international shipment of hazardous waste."[191] The treaty, signed by 180 states and the European Union,[192] "significantly complicated" overseas operations of U.S. forces, according to Jim Carr, an attorney for the DOD's Defense Reutilization Marketing Service.[193] First proposed in 1987, the treaty aimed to ban the exports of hazardous wastes from developed to developing countries.[194] According to Sharron Philo, Associate General Counsel at the Defense Logistics Agency, "[i]n the absence of ratification, it is DOD policy to comply with the provisions of the Convention to the extent possible."[195] Ms. Philo observed that while waste generated at U.S. facilities and disposed of on-site is not problematic, waste "shipped back to the U.S. (or to a third country) . . . is considered a transboundary movement . . . trigger[ing] Basel compliance."[196] "In these situations, the country of export would be the host country (not the U.S.)."[197] The Basel Convention resulted in instances where hazardous waste could not be shipped back to the United States for proper disposal due to the governments of Spain and Panama refusing to allow the

188 *Id.* at 157.

189 Barbara Crosette, *Washington Is Criticized for Growing Reluctance to Sign Treaties*, N.Y. TIMES, Apr. 4, 2002, http://www.nytimes.com/2002/04/04/international/04TREA.html (last visited Feb. 14, 2015).

190 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, art. IV, Mar. 22, 1989, 1673 U.N.T.S. 57, *available at* https://treaties.un.org/doc/Treaties/1992/05/19920505%2012-51%20PM/Ch_XXVII_03p.pdf.

191 *Hazardous Waste Disposal Complicates U.S. Deployments*, NAT'L DEF. MAG., July 2001, http://www.nationaldefensemagazine.org/archive/2001/July/Pages/Hazardous_Waste4229.aspx (last visited Feb. 14, 2015) [hereinafter *Hazardous Waste Disposal*].

192 U.N. Treaty Collection, *Status of Basel Convention*, https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-3&chapter=27&lang=en (last visited Feb. 14, 2015).

193 *Hazardous Waste Disposal*, *supra* note 191 (internal quotation marks omitted).

194 Jim Puckett, Basel Action Network, *The Basel Treaty's Ban on Hazardous Waste Exports: An Unfinished Success Story*, http://ban.org/library/ierarticle.html (last visited Feb. 14, 2015) (initially published in International Environmental Reporter, Dec. 2000).

195 Sharron Philo, Address at the Overseas Hazardous Waste Disposal and Readiness Workshop: Basics of Basel: Provisions and History (July 13–14, 2000), *available at* http://www.denix.osd.mil/international/upload/Keynoteadd.doc (last visited Feb. 14, 2015).

196 *Id.*

197 *Id.*

waste to transit the Straits of Gibraltar and Panama Canal.[198] Such contingencies resulted in greater reliance in on-site disposal and host-nation contractors, potentially causing even more hazardous waste accumulation and eventually leading to on-site dumping.[199]

Though not applicable in current post-conflict areas, the United States is also a signatory to the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques of 1977 (ENMOD).[200] ENMOD arose in the wake of the use of mechanical and chemical defoliants—such as Agent Orange—and cloud seeding techniques in Vietnam, and is designed to prohibit the "hostile use of environmental modification techniques having widespread, long-lasting, or severe effects."[201] ENMOD does not, in and of itself, protect the environment from damage or destruction in warfare; rather, "it places limitations on environmental modification for hostile purposes."[202] In reality, the treaty does not afford much protection for the environment, since "most wartime environmental damage results from attacks against enemy forces" rather than attempts to modify the environment, and "[m]ost of the prohibited techniques are militarily unrealistic anyway."[203]

Other treaties protecting the environment include the Hague Convention, which codified the principle of customary international law stating methods of injuring the enemy are not unlimited.[204] Hague Convention Number IV (Hague IV) and its accompanying regulations marked the first time environmental principles were incorporated into treaty law.[205] The accompanying regulations forbid the destruction of enemy property

198 Jim Carr, Counsel for Def. Reutilization Mktg. Serv. Int'l, Address at the Overseas Hazardous Waste Disposal and Readiness Workshop: Current Practices and Issues (July 13–14, 2000), http://www.denix.osd.mil/international/upload/Keynoteadd.doc (last visited Feb. 14, 2015).

199 *Hazardous Waste Disposal, supra* note 191.

200 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, Signatory List, May 18, 1977, 31 U.S.T. 33, 1108 U.N.T.S. 1151, *available at* http://www.state.gov/t/isn/4783.htm.

201 *Id.* art. 1. *See also Weather Modification: Hearings Before the Subcomm. on Oceans and Int'l Env't of the Comm. on Foreign Rel.*, 93rd Cong. 77, 88 (1974) (describing the cloud seeding techniques used in Vietnam and the lack of governing principles of law); Tom Fawthrop, *Vietnam's War Against Agent Orange*, BBC NEWS, June 14, 2004, http://news.bbc.co.uk/2/hi/health/3798581.stm (last visited Feb. 14, 2015) (explaining the purpose and effects of using Agent Orange in Vietnam).

202 Rymn James Parsons, *The Fight to Save the Planet: U.S. Armed Forces, "Greenkeeping," and Enforcement of the Law Pertaining to Environmental Protection During Armed Conflict*, 10 GEO. INT'L ENVTL. L. REV. 441, 457 (1998).

203 Stephanie N. Simonds, *Conventional Warfare and Environmental Protection: A Proposal for International Legal Reform*, 29 STAN. J. INT'L L. 165, 187 (1992).

204 Convention (IV) Respecting the Laws and Customs of War on Land and Its Annex: Regulation Concerning the Laws and Customs of War on Land, preamble, Oct. 18, 1907, 36 Stat. 2277, 205 Consol. T.S. 277 [hereinafter Hague IV].

205 INT'L & OPERATIONAL LAW DEP'T, THE JUDGE ADVOCATE GEN.'S LEGAL CTR. & SCH., U.S. ARMY, OPERATIONAL LAW HANDBOOK 329 (Major William Johnson ed., 2013), *available at* http://www.loc.gov/rr/frd/Military_Law/pdf/operational-law-handbook_2013.pdf [hereinafter OPERATIONAL LAW HANDBOOK].

"unless such destruction . . . be imperatively demanded by the necessities of war."[206] The use of the words "enemy property" rather than "environment" have been criticized as being of limited utility to protect the environment of a country. This, along with an obligation "on occupying forces to preserve property in occupied territory"[207] means the onus is to protect discrete parcels of land associated with an owner, rather than the environment. However, the incorporation of international customary law under the Martens Clause causes U.S. military legal advisors, also known as Judge Advocates, to advise commanders that "environmental protections enjoy the widest spectrum of application of any of the [law of armed conflict] conventions; they apply to all property, wherever located, and by whomever owned."[208] Again, the application is to property, rather than to environment. While other treaties specifically reference the environment, they lack the "wide application enjoyed by Hague IV."[209] Article 23(g) of Hague IV forbids the destruction or damage of property in the absence of military necessity,[210] a principle of international law discussed below. When analyzing the principle of military necessity regarding the destruction of property, judge advocates are instructed to "pay particular attention to the geographical extent (i.e., how widespread the damage will be), longevity, and severity of the damage upon the target area's environment."[211]

According to Professor Margaret Okorodudu-Fubara's work on the legal implications of "environmental warfare" in the Persian Gulf War,[212] two treaties provide the greatest protection to the environment during armed conflict. These treaties are the Geneva Convention Relative to the Protection of Civilian Persons in Time of War 1949 (Fourth Geneva Convention)[213] and the Additional Protocol to the Geneva Conventions of 1949, and Relating to the Protection of the Victims of International Conflicts of 1977 (Protocol I).[214] Article 53 of the Fourth Geneva Convention protects the environment of an occupied territory by prohibiting the destruction or damage of "real or personal property belonging individually or collectively to private persons, or to the State, or to other public authorities, or to social or cooperative organizations," unless absolutely necessary for lawful military purposes.[215]

206 Hague IV, *supra* note 204, art. 23.

207 Parsons, *supra* note 199, at 448–49.

208 *See* OPERATIONAL LAW HANDBOOK, *supra* note 202, at 329 (discussing the traditional law of armed conflict application at the Hague Convention IV).

209 *Id.* at 330.

210 Hague IV, *supra* note 204, art. 23.

211 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 329.

212 *See* Margaret T. Okorodudu-Fubara, *Oil in the Persian Gulf War: Legal Appraisal of an Environmental Warfare*, 23 ST. MARY'S L.J. 123, 197 (1991) (asserting that the international customary law denounces environmental warfare and thus there is a legal obligation on nations not to resort to environmental warfare).

213 Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287 [hereinafter Geneva Convention].

214 Protocol Additional to the Geneva Convention of August 12, 1949, and Relating to the Protection of the Victims of International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Protocol I].

215 Geneva Convention, *supra* note 208, at 322.

Under Article 147 of the Fourth Geneva Convention, "extensive damage or destruction of property not justified by military necessity . . . and carried out unlawfully and wantonly [constitutes a] grave breach," requiring prosecution and extradition of persons suspected of committing the breach.[216] Judge advocates are reminded:

> A simple breach only requires parties to take measures necessary for the suppression of the type of conduct that caused the breach. United States policy requires the prompt reporting and investigation of all alleged war crimes (including environmental violations), as well as taking appropriate corrective action as a remedy when necessary.[217]

Adam Roberts, in his essay on the law of war and environmental damage, observes the inclusion of this prohibition "in a treaty that has virtually universal acceptance by states, and is indisputably in force in international wars."[218]

The United States has not ratified the 1977 Protocols Additional to the Geneva Conventions (API and APII) and is therefore only bound by those provisions reflecting customary international law and those restating parts of the Fourth Geneva and Hague Conventions.[219] Protocol I goes beyond baseline protections of property, instead extending a prohibition on "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term, and severe damage to the natural environment"[220] and "thereby to prejudice the health or survival of the population."[221]

Protocol I differs from previous attempts at protecting the environment by setting a maximum threshold of permissible environmental destruction, rather than employing a balancing test of military necessity versus expected destruction.[222] Regardless of the amount of justification or strategic importance of such destruction, any act that exceeds this threshold constitutes a violation of the law of armed conflict.[223] Articles 35 and 55 define this limit as any method of warfare "which [is] intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment."[224] Unlike other treaties, Protocol I goes beyond intentional damage to the environment to include damage which is reasonably

216 *Id.* at 388 (internal quotation marks omitted).

217 *Id.* (footnote omitted).

218 Adam Roberts, *The Law of War and Environmental Damage*, *in* THE ENVIRONMENTAL CONSEQUENCES OF WAR: LEGAL, ECONOMIC, AND SCIENTIFIC PERSPECTIVES 47, 57 (Jay E. Austin & Carl E. Bruch eds., 2000).

219 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 331 (quoting Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug., 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287).

220 Protocol I, *supra* note 211, art. 35.

221 *Id.* art. 55.

222 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 331.

223 *Id.*

224 Protocol I, *supra* note 211, at arts. 35, 55.

foreseeable.[225] The commentary to API defines "long-term" as measured in decades, e.g., twenty to thirty years.[226] U.S. military doctrine and other experts borrowed the term "widespread" from ENMOD, meaning several hundred square kilometers.[227] "Severe" incorporates Article 55's reference to an act that causes "prejudice [to] the health or survival of the population."[228] The conjunctive phrase "widespread, long term, and severe damage" requires all three elements to be present, thereby setting a very high threshold.[229] One commentary on Article 35 observed it would "not impose any significant limitation on combatants waging conventional warfare. [Article 35] seems primarily directed to high level policy decision makers and would affect such unconventional means of warfare as the massive use of herbicides or chemical agents which could produce widespread, long-term and severe damage to the natural environment."[230] Another argues the threshold is so high even "the majority of carnage caused during World Wars I and II (with the possible exception of the two nuclear devices exploded over Japan) would not have met this threshold requirement."[231]

Other provisions of Protocol I regarding the environment include Article 55's prohibition on reprisals against the natural environment and Article 54's prohibition on targeting "objects indispensable to the survival of the civilian population" such as agricultural areas and drinking water installations, "for the specific purpose of denying them for their sustenance value to the civilian population."[232] Article 56 also prohibits attacks on "works and installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, . . . if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population."[233]

In the early stages of Operation Enduring Freedom some accused the United States of violating Article 56 by attacking the hydroelectric power station near the Kajaki Dam in Afghanistan.[234] Transmission lines from the dam were hit by an airstrike in November 2001 and have been hit on several occasions since then.[235] Though not directly targeted by the airstrikes, the office of the U.N. regional coordinator for southern Afghanistan reported

225 MICHAEL BOTHE ET AL., NEW RULES FOR VICTIMS OF ARMED CONFLICTS: COMMENTARY ON THE TWO 1977 PROTOCOLS ADDITIONAL TO THE GENEVA CONVENTIONS OF 1949, at 345 (1982).

226 CLAUDE PILLOUD ET AL., INT'L COMM. OF THE RED CROSS, COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, at 416–17 (1987).

227 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 332.

228 Protocol I, *supra* note 211, at 28.

229 Guy B. Roberts, *The New Rules for Waging War: The Case Against Ratification of Additional Protocol I*, 26 VA. J. INT'L L. 109, 146–47 (1985).

230 BOTHE ET AL., *supra* note 222, at 348.

231 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 332.

232 Protocol I, *supra* note 211, art. 54.

233 *Id.* art. 56.

234 *See* Augst, *supra* note 56, at 10,680 (noting that the Taliban spokesmen claimed the dam itself was struck, and as a result the United States violated Article 56).

235 *Id.* at 10,679.

damage to the 300-foot high, 900-foot long dam could have caused massive flooding on important agricultural lands.[236]

Two other treaties indirectly implicated in protecting the environment are the 1954 Hague Cultural Property Convention and the 1980 Certain Conventional Weapons Convention and Protocols.[237] The United States did not ratify the Hague Cultural Property Convention until 2008, though it claimed its military operations were consistent with the treaty before that point.[238] The Hague Cultural Property Convention and First Protocol protect a broad range of property regarded as "cultural property," including "property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history [and] archaeological sites" and "buildings . . . such as museums, large libraries and depositories" of large amounts of cultural property.[239] Although the treaty does not directly cover environmental damage, actions large enough and damaging enough to violate this treaty are also likely to damage the environment.[240] Like the other treaties mentioned above, many observers criticize the Hague Cultural Property Convention for lacking an enforcement mechanism.[241]

The U.N. Convention on Certain Conventional Weapons states "it is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment."[242] It was ratified by the United States in 1995.[243] Article 2(4) of the Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III) prohibits "mak[ing] forests or other kinds of plant cover the object of attack by incendiary weapons except when such natural elements are used to cover, conceal or camouflage combatants or other military objectives, or are themselves military objectives."[244] Again, the use of

236 *Id.*

237 Final Act of the Intergovernmental Conference on the Protection of Cultural Property in the Event of Armed Conflict, May 14, 1954, 249 U.N.T.S. 216 [hereinafter Hague Convention]; Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious to Have Indiscriminate Effects (with Protocols), Oct. 10, 1980, 1342 U.N.T.S. 137.

238 *See* SEN. JOE BIDEN, THE HAGUE CULTURAL PROPERTY CONVENTION, S. EXEC. DOC. NO. 110-26, at 7–10 (2008) ("The United States already complies in practice with the norms contained in this Convention."); PRESIDENT WILLIAM J. CLINTON, THE HAGUE CONVENTION AND THE HAGUE PROTOCOL: MESSAGE FROM THE PRESIDENT OF THE UNITED STATES, S. TREATY DOC. NO. 106-1, at IV (1999) ("United States military policy and the conduct of operations are entirely consistent with the Convention's provisions.").

239 Hague Convention, *supra* note 237, at ch. 1, art. 1.

240 Roberts, *supra* note 213.

241 *See, e.g.*, *id.*

242 Convention on Prohibitions or Restrictions of the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Oct. 10, 1980, 19 I.L.M. 1523, 1524 [hereinafter UNCCCW].

243 U.N. Treaty Collection, *Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects (with Protocols I, II, and III)*, https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXVI/XXVI-2.en.pdf (last visited Feb. 14, 2015).

244 Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons, Oct. 10, 1980, 19 I.L.M. 1534, 1535.

the conjunctive "widespread, long-term *and* severe" damage to the environment sets a very high threshold, similar to that of Protocol I.[245] Therefore, the usefulness of this prohibition is limited.

The Convention on Cluster Munitions entered into force on August 1, 2010.[246] The United States is not a signatory, insisting that cluster munitions "are acceptable under the laws of armed conflict" and "effective weapons against a variety of targets, such as air defense radars, armor, artillery, and large enemy personnel concentrations."[247] The Convention on Cluster Munitions "prohibit[s] the use, production, transfer and stockpiling of cluster munitions," citing the wide area impact of the weapon and the inability to distinguish between combatants and noncombatants.[248] Signatories believe wide use of cluster munitions leaves behind UXO that later may kill and maim civilians.[249] According to CCN supporters, the use of cluster munitions fails the test of discrimination, one of the key principles underlying customary international law.[250]

B. Customary International Law

The four underlying principles of customary international law governing the law of war are proportionality, discrimination, military necessity, and unnecessary suffering, also known as humanity. Although not often couched in environmental terms, each of these principles relates to protecting the environment because they underlie the notion that wanton and unnecessary destruction of the environment, which causes civilian population suffering, violates the law of war. While these principles are codified in some treaties where the United States is not a party, the United States nevertheless is bound to segments of treaties to the extent these four principles of customary international law arise.

Military necessity, as codified in Hague IV, forbids a belligerent "[t]o destroy or seize the enemy's property, unless such destruction or seizure be imperatively demanded by the necessities of war."[251] Military strategists believe this principle only limits a combatant to the amount of force necessary to secure the surrender of an opponent as soon as possible.[252] During the Persian Gulf War, Iraq deliberately released 1.5 million barrels of oil into the Persian Gulf, arguing it was trying to slow the advance of

245 UNCCCW, *supra* note 237 (emphasis added).

246 U.N. Treaty Collection, *Convention on Cluster Munitions*, https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXVI/XXVI-6.en.pdf (last visited Feb. 14, 2015).

247 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 27.

248 Convention on Cluster Munitions, May 30, 2008, 2688 U.N.T.S. 39.

249 *See id.* at 96.

250 *See* Virgil Wiebe, *Footprints of Death: Cluster Bombs As Indiscriminate Weapons Under International Humanitarian Law*, 22 MICH. J. INT'L L. 85, 87 (2000) (describing cluster bombs as "indiscriminate weapons" that create "prohibitively high" risk of civilian casualties).

251 Hague IV, *supra* note 204, art. 23(g).

252 ONITA DAS, ENVIRONMENTAL PROTECTION, SECURITY AND ARMED CONFLICT: A SUSTAINABLE DEVELOPMENT PERSPECTIVE 148 (2013).

Coalition Forces.[253] Additionally, retreating Iraqi forces sabotaged Kuwaiti oil wells, setting 611 wells alight and damaging others to release millions of gallons of oil into the ecosystem.[254] Arguably, the smoke from the oil well fires did hinder Coalition Forces' aerial operations by obscuring the Iraqi ground movements. However, the action then fails the principle of proportionality, which states an "anticipated loss of life and damage to property incidental to attacks must not be excessive in relation to the concrete and direct military advantage expected to be gained."[255] The massive smoke clouds produced by the Kuwaiti oil fires lingered for months, releasing dangerous toxins into civilian communities of Kuwait and neighboring Gulf States.[256] Large, flammable lakes threatened several residential areas.[257] The resulting oil slick created by the release of millions of gallons of oil into the Persian Gulf endangered desalination plants supplying the entire region's drinking water.[258] The severe atmospheric pollution caused by the fires was disproportionate to any anticipated military gain, and the damage was too massive to be dismissed as mere collateral damage.[259] According to one expert, the destruction of "all twenty-six gathering centers that were designed to separate the oil, gas, and water from one another—a process that is essential for oil production" demonstrated the true nature of Iraqi intentions.[260] No conceivable military advantage was gained by this wanton destruction, only revenge on the part of a defeated army.

Iraq was not alone in being accused of violating customary international law during Desert Storm and Operation Iraqi Freedom. As mentioned above, many countries believe cluster munitions used by the United States during the wars failed the test of discrimination, which demands combatants and noncombatants must be distinguished so parties to an armed conflict direct their operations only against combatants and military objectives.[261] As memorialized in Article 51 of Protocol I, combatants are prohibited from attacking in a manner:

> not directed at a specific military objective; . . . employ[ing] a method or means of combat which cannot be directed at a specific military objective; . . . employ[ing] a method or means of combat the effects of which cannot be

253 *Id.* at 144.

254 *Id.* at 147.

255 OPERATIONAL LAW HANDBOOK, *supra* note 202, at 13.

256 DAS, *supra* note 250, at 144–45.

257 *Id.* at 145.

258 *Id.*

259 *Id.* at 151.

260 *Id.* at 151–52.

261 *See* OPERATIONAL LAW HANDBOOK, *supra* note 202, at 12 (citing Protocol I, *supra* note 211, art. 48) (discussing that, while the United States does accept some provisions of Protocol I, the handbook provides no guidance on what procedures might violate the test of discrimination).

> limited as required; . . . [and] of a nature to strike military objectives and civilians or civilian objects without distinction.[262]

Amnesty International declares, "[c]luster bombs present a high risk of violating the prohibition of indiscriminate attack, because of the wide area covered by the numerous bomblets released."[263] Additionally, the organization condemns the relatively high initial failure rate of the bomblets, which "do not explode upon impact becoming de facto anti-personnel mines" endangering noncombatants who later encounter undetonated munitions.[264]

Near the beginning of Operation Iraqi Freedom and Operation Enduring Freedom, the failure to discriminate between combatants and noncombatants due to the bomblet dud rate was exacerbated by an unintentional oversight with horrifying results: food packets distributed by Coalition Forces via aircraft resembled the same dimensions and colors as cluster bomb munitions bomblets.[265] In 2001, ten-year-old Mohebolah Seraj lost three fingers in an explosion when he picked up an object he mistakenly thought was an aid packet; this type of injury is especially devastating in a country where the majority of the population earns their living from manual labor.[266] When the obvious danger was pointed out to General Richard Myers, the chairman of the Joint Chiefs of Staff at the time, he acknowledged the issue and stated that a re-design was in progress and fliers were being dropped to inform civilians of the difference.[267] General Myers remarked: "Unfortunately, they get used to running to yellow."[268] Later packages were changed to a salmon color.[269]

The fourth principle of international law—unnecessary suffering (also known as "humanity" or "superfluous injury")—states, "it is especially forbidden . . . [t]o employ arms, projectiles, or material calculated to cause unnecessary suffering."[270] This principle may strike some as bizarre given the horrific nature of war, but contained therein is a tacit acknowledgement some suffering is inherent to armed conflict. When a single cluster bomb unit explodes, it delivers hundreds of pieces of shrapnel in all directions traveling at "three times the speed of a bullet shot from an automatic rifle, each piece capable of causing injury at long distances."[271] If the bomblet does

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262 Protocol I, *supra* note 211, art. 51(4)(c).

263 Amnesty Int'l, *Afghanistan: Accountability for Civilian Deaths*, http://www.amnesty.dk/nyhed/afghanistan-accountability-civilian-deaths (last visited Feb. 14, 2015).

264 *Id.*

265 CLUSTER BOMBS IN AFGHANISTAN, *supra* note 61.

266 *See* Amy Waldman, *Bomb Remnants Increase War's Toll*, N.Y. TIMES, Nov. 23, 2001, http://www.nytimes.com/2001/11/23/international/asia/23BOMB.html (last visited Feb. 14, 2015).

267 Press Release, U.S. Dep't of Def., DOD News Briefing—Secretary Rumsfeld and General Myers (Nov. 1, 2001), http://www.defense.gov/Transcripts/Transcript.aspx?TranscriptID=2255 (last visited Feb. 14, 2015).

268 *Id.*

269 Bill Dugan, *Project Briefing*, http://www.billdugan.com/projects/hdr/ (last visited Feb. 14, 2015).

270 Hague IV, *supra* note 204, art. 23(e).

271 McDonnell, *supra* note 65, at 69.

not kill the individual right away, removing the fragments, which weigh less than thirty grains, is very difficult.[272] Some argue the maiming and disfigurement caused by cluster munitions violate the principle of unnecessary suffering due to the painfulness and severity of the wounds among the survivors.[273] Additional effects of environmental harm, including the poisoning of potential agricultural lands, water supplies, and residential areas by UXO inflicts unnecessary suffering on the civilian population as a whole.[274]

Beyond these four principles of customary international law, so-called soft-law instruments, which are nonbinding agreements, guide whether and how armed combatants protect the environment during and after conflict.[275] For example, the Declaration of the United Nations Conference on the Human Environment declares: "States have . . . the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."[276] This responsibility appears to apply, by extension, to areas affected during times of armed conflict and the damage inflicted therein.[277] The Rio Declaration of 1992 went further, asserting: "Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary."[278] Following the Rio Declaration, the U.N. General Assembly adopted Resolution 47/37, urging states to implement internal measures to comply with international law protecting the environment during armed conflict.[279] These declarations are important first steps in recognizing the importance of protecting the environment both during and after conflicts and could serve as precursors for later treaties. The United States is a signatory to all three items, with some reservations on their application and interpretation.[280]

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272 *Id.*

273 *Id.* at 69–70.

274 Augst, *supra* note 56, at 10,672.

275 *See, e.g.*, Michael Bothe et al., *International Law Protecting the Environment During Armed Conflict: Gaps and Opportunities*, 92 INT'L REV. OF THE RED CROSS 569, 584 (2010) (stating that soft-law instruments are not binding until they rise to the level of customary international environmental law).

276 United Nations Conference on the Human Environment, Stockholm, Swed., June 5–16, 1972, *Report of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev.1, at 5 (1973).

277 *See, e.g.*, BOTHE ET AL., *supra* note 275 (discussing various provisions in international agreements that apply either explicitly or implicitly in times of war and asserting that the Stockholm principle discussed may apply in times of war).

278 United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, Annex I, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex I (Aug. 12, 1992), http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (last visited Feb. 14, 2015).

279 G.A. Res. 47/37, at 2, U.N. Doc. A/RES/47/37 (Feb. 9, 1993).

280 *See, e.g.*, BOTHE ET AL., *supra* note 275, at 584–85 (discussing the items mentioned and debating the extent to which they apply in times of conflict).

There are several problems with relying on international law as a means to deter or remedy environmental destruction caused by war. Many of these treaties either lack enforcement provisions completely or set thresholds so high for enforceability as to be essentially useless.[281] Furthermore, as the world's only remaining superpower, the United States is unlikely to submit itself to the jurisdiction of a regulatory body to judge the rightness or wrongness of its military actions, as demonstrated by the United States' refusal to join the International Criminal Court.[282] Therefore, the only viable avenue to redress environmental damage caused by U.S. combat operations is through U.S. domestic laws, rules, and regulations. Part IV examines U.S. domestic law, policy, and regulation guiding the U.S. military's establishment of an environmental agenda during and after armed conflict.

IV. U.S. DOMESTIC LAW AND POLICY

Since the 1970s, a variety of environmental statutes have governed U.S. forces stationed domestically.[283] Generally speaking, domestic environmental statutes do not apply extraterritorially.[284] In most instances a statute must have specific language enabling its application exterritorialy.[285] Nonetheless, many U.S. environmental statutes extend outside U.S. borders through the operation of executive branch policies, as well as occasional court cases.[286] This Part discusses U.S. regulations, policies, and laws that apply to U.S. military installations and operating bases domestically and overseas.

As mentioned above, RCRA extended coverage to abandoned military munitions domestically under the Military Munitions Rule of 1997.[287] Prior to 1997, RCRA defined some guidelines for hazardous waste generation, transportation, treatment, storage, and disposal for domestic U.S. military installations.[288] However, RCRA did not completely apply to DOD personnel until passage of the Federal Facility Compliance Act of 1992, which extended RCRA to federal facilities, subjecting federal employees to personal criminal liability "for environmental violations of any federal or state solid waste or [hazardous waste] law."[289] In addition to RCRA

281 *See supra* Part III.

282 Global Policy Forum, *U.S. Opposition to the International Criminal Court*, https://www.globalpolicy.org/us-un-and-international-law-8-24/us-opposition-to-the-icc-8-29.html (last visited Feb. 14, 2015).

283 *See* Natural Res. Def. Council, *Environmental Laws and Treaties*, http://www.nrdc.org/reference/laws.asp (last visited Feb. 14, 2015) (describing briefly the major federal statutes that pertain to the environment in the United States).

284 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 322.

285 *Id.*; Equal Emp't Opportunity Comm'n v. Arabian Am. Oil Co., 499 U.S. 244, 248 (1991).

286 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 322–23.

287 *See supra* text accompanying notes 46–47.

288 *See* Parola v. Weinberger, 848 F.2d 956, 960, 962 (9th Cir. 1988) (concluding that federal military installations fall within the scope of RCRA § 6001, which requires federal agencies and instrumentalities to comply with federal, state, and local requirements for solid and hazardous waste disposal).

289 U.S. DEP'T OF ARMY, FIELD MANUAL 3-34.5, ENVIRONMENTAL CONSIDERATIONS § A-26 (2010) [hereinafter FM 3-34.5].

guidelines, military installations must also comply with state permitting systems setting requirements for hazardous waste treatment, storage, and disposal.[290]

When conducting training or operations involving the management of hazardous waste, unit commanders are required to implement a hazardous waste management plan, which includes collecting and storing solid waste, cleaning up and reporting hazardous spills, and transporting hazardous materials according to local and installation procedures that comply with state and federal regulations.[291] Additionally, the Emergency Planning and Community Right-to-Know Act,[292] extended to federal facilities via Executive Order (EO) 12856, requires all military installations to have reporting and cleanup procedures in the event of an accidental hazardous material release.[293] In order to adhere to local, state, and federal environmental regulations, the military employs a vast array of environmental management and legal personnel at its domestic and overseas fixed installations.[294]

The National Environmental Policy Act (NEPA)[295] requires all federal entities, including the military, to provide a detailed evaluation of the environmental impact of any proposed major action significantly affecting the quality of the human environment.[296] Initially, appellate courts differed regarding NEPA's applicability extraterritorially;[297] later, EO 12114 required the military to conduct environmental analyses for major federal actions affecting the human environment overseas.[298] Department of Defense Directive (Defense Directive) 6050.7 implements EO 12114.[299] Defense Directive 6050.7 requires DOD officials to take environmental considerations into account when they conduct a major federal action causing significant harm to the environment of "the global commons"[300] not involved in the original action.[301] Similarly, DOD must also consider the environment if the action produces in a foreign nation a toxic emission that is strictly regulated by federal law due to its radioactive characteristics,[302] or if the action would

290 *Id.* § A-53.

291 *Id.* § A-54.

292 42 U.S.C. §§ 11001–11050 (2012).

293 FM 3-34.5, *supra* note 289, at § A-9.

294 *Id.* § A-2.

295 42 U.S.C. §§ 4321–4347 (2012).

296 National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4347 (2012). The requirement for an environmental impact statement is set forth in 42 U.S.C. § 4332(2)(C)(i).

297 *Compare* Wilderness Soc'y v. Morton, 463 F.2d 1261, 1261, 1262–63 (D.C. Cir. 1972) (per curiam) (finding that NEPA applied to federal activity in Trust Territory), *with* Natural Res. Def. Council, Inc. v. Nuclear Regulatory Comm'n, 647 F.2d 1345, 1347–48 (D.C. Cir. 1981) (finding that NEPA did not impose requirements on nuclear export decisions exclusively in foreign jurisdictions).

298 Exec. Order No. 12,114, 44 Fed. Reg. 1957 (1979), *reprinted as amended in* 42 U.S.C. § 4321 (1982) [hereinafter E.O. 12114]; OPERATIONAL LAW HANDBOOK, *supra* note 205, at 335.

299 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 335.

300 U.S. DEP'T OF DEF., DIRECTIVE 6050.7, ENVIRONMENTAL AFFECTS ABROAD OF MAJOR DEPARTMENT OF DEFENSE ACTIONS § E.1.1 (1979) [hereinafter Defense Directive 6050.7].

301 *Id.* § E2.2.1.1.

302 *Id.* § E2.2.1.2.

significantly harm natural or ecological resources of global importance designated by the President or the Secretary of State.[303] The purpose of EO 12114 is "to provide information to decisionmakers, increase awareness and interest in environmental concerns, and encourage environmental cooperation with foreign nations."[304] Field Manual 3-34.5 elaborates: "[Defense Directive 6050.7]'s sole objective is to establish internal procedures to achieve this purpose, and nothing in it shall be construed to create a cause of action."[305]

EO 12114 and Defense Directive 6050.7 exempt military actions undertaken "when the national security or national interest is involved" or the action occurs "in the course of an armed conflict."[306] Though exemptions on the basis of national security are not necessarily applicable during peacekeeping and support operations, they can be extended to these operations with the certification of the Secretary of Defense or the President.[307] Decisions to extend coverage to these operations are exceedingly rare; therefore, EO 12114 has "little practical effect" during contingency or operational deployments.[308] National security-based exemptions are characteristic of nearly all Defense Instructions and Defense Directives regarding the environment.[309]

At permanent installations overseas, however, there is a different dynamic. The United States depends on the goodwill of host-nation governments for stationing and airspace access.[310] Several military regulations protect natural resources and the environment at fixed U.S. military installations, unlike contingency outposts.[311] The overall authority for these matters is Department of Defense Instruction (Defense Instruction)

303 *Id.* § E2.2.1.3.

304 FM 3-34.5, *supra* note 289, § A-74.

305 *Id.* § A-68.

306 E.O. 12114, *supra* note 298, at 1959; Defense Directive 6050.7, *supra* note 300, §§ E2.3.3.1.3–E2.3.3.1.4.

307 Defense Directive 6050.7, *supra* note 300, § E2.3.3.1.4.

308 GREEN WARRIORS, *supra* note 19, at 33.

309 U.S. DEP'T OF DEF., INSTRUCTION NO. 4715.05, ENVIRONMENTAL COMPLIANCE AT INSTALLATIONS OUTSIDE THE UNITED STATES 2 (2013), *available at* http://www.dtic.mil/whs/directives/corres/pdf/471505p.pdf [hereinafter DEFENSE INSTRUCTION 4715.05] (exempting "[e]nvironmental analyses conducted in accordance with E.O. 12114"); U.S. DEP'T OF DEF., INSTRUCTION NO. 4715.08, REMEDIATION OF ENVIRONMENTAL CONTAMINATION OUTSIDE THE UNITED STATES 1 (2013), *available at* http://www.dtic.mil/whs/directives/corres/pdf/471508p.pdf [hereinafter DEFENSE INSTRUCTION 4715.08] (exempting "[s]pill responses governed by [Defense Instruction] 4715.05"); *see also* GREEN WARRIORS, *supra* note 19, at 33 (discussing DOD instructions like Defense Instructions 4715.05 and 4715.08 that "also exclude contingency operations").

310 *Cf.* Paul N. Nagy, *Access Is Key to Power Projection*, PROC. MAG., Feb. 1999, http://www.usni.org/magazines/proceedings/1999-02/access-key-power-projection (last visited Feb. 14, 2015) (describing dependence on host-nation goodwill for the U.S. Navy's access to bases and administrative complexes in Japan, Singapore, and Bahrain).

311 *See, e.g.*, Defense Directive 6050.7, *supra* note 300, § E2.1 (providing for requirements, such as procedural actions, to inform officials of "pertinent environmental considerations when authorizing or approving certain major DOD actions that do significant harm to the environment of a foreign nation or to a protected global resource").

4715.05, which is limited to the boundaries of the installation, and does not apply to off-installation training and operations of military aircraft and vessels.[312] Unlike contingency environments, the U.S. military has a robust body of environmental standards for overseas fixed installations published in the Overseas Environmental Baseline Guidance Document (OEBGD).[313] The OEBGD serves as a generic template for overseas installations establishing minimum standards and practices later developed into country-specific standards known as Final Governing Standards.[314] Defense Instruction 4715.05 specifically exempts operational deployments from environmental standards in cases of "hostilities, contingency operations in hazardous areas" and when "U.S. Forces [are] operating as part of a multinational force not under full U.S. control."[315]

When environmental damage occurs in countries with fixed installations, Defense Instruction 4715.08 controls the extent and amount of remediation.[316] Again, this regulation specifically exempts "actual or threatened hostilities, security assistance programs, peacekeeping missions, or relief operations" as well as "logistics, maintenance, or administrative support functions provided by a contractor off base."[317] It is designed to operate in the absence of an applicable international agreement.[318] The military is required to "take prompt action to address a substantial impact to human health and safety due to environmental contamination" located at a DOD operations.[319]

National security exemptions are not always absolute. In 2010, Congress addressed use of burn pits in the National Defense Authorization Act for Fiscal Year 2010,[320] requiring the development of "regulations prohibiting the disposal of covered waste in open-air burn pits during contingency operations except in circumstances in which the Secretary determines that no alternative disposal method is feasible."[321] Taking note of previous exemptions in circumstances of national security, Congress added,

312 Defense Instruction 4715.05, *supra* note 309, at 2.

313 *See id.* at 2–3, 23 (defining OEBGD as a "set of objective criteria and management practices the DOD develops . . . to protect human health and the environment").

314 *Id.* at 23 (defining Final Governing Standards as a "comprehensive set of country-specific substantive environmental provisions; typically technical limitations on effluent, discharges, etc.").

315 *Id.* at 1–2.

316 *See* Defense Instruction 4715.08, *supra* note 309, at 1 ("[This instruction] update[s] established policy and assigned responsibilities and procedures for remediation of environmental contamination on DOD installations outside the United States.").

317 U.S. DEP'T OF DEF., INSTRUCTION NO. 4715.08, ENVIRONMENTAL REMEDIATION FOR DOD ACTIVITIES OVERSEAS 2 (1998), *available at* http://biotech.law.lsu.edu/blaw/dodd/corres/pdf2/i47158p.pdf, *amended by* U.S. DEP'T OF DEF., INSTRUCTION NO. 4715.08, REMEDIATION OF ENVIRONMENTAL CONTAMINATION OUTSIDE THE UNITED STATES 1 (2013).

318 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 324.

319 Defense Instruction 4715.08, *supra* note 309, at 8.

320 National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, 123 Stat. 2190 (2009) (codified in various U.S.C. titles).

321 *Id.* § 317(a)(1). The requirements for burn-pit regulations are set forth in 10 U.S.C. § 2701 (2012).

"[s]uch regulations shall apply to contingency operations that are ongoing as of the date of the enactment of this Act, including Operation Iraqi Freedom and Operation Enduring Freedom, and to contingency operations that begin after the date of the enactment of this Act."[322] In response, DOD issued a memorandum, "prohibiting the disposal of covered waste in open-air burn pits during contingency operations except when the relevant commander of a combatant command makes a formal determination that no alternative disposal method is feasible."[323]

In September 2009, CENTCOM, the higher headquarters for U.S. forces in Iraq and Afghanistan, issued CENTCOM Regulation 200-2, establishing minimal acceptable standards for environmental management and waste disposal for units in its area of operations.[324] According to CENTCOM officials, this regulation was designed to "codify and expand" preexisting environmental Standard Operating Procedures (SOP) issued by theater commanders in Iraq and Afghanistan.[325] Regulations have more weight and are more easily enforceable than SOPs, which merely serve as guidance.[326] Nonetheless, GAO personnel reviewing disposal operations in 2010 found that four FOBs surveyed did not comply with CENTCOM Regulation 200-2.[327] When asked why they failed, personnel responded either that they were unaware of the regulation or compliance was impossible given the limited manpower devoted to solid waste management.[328] GAO found compliance further complicated by the amount of military supplies "made of, or packaged in, materials . . . prohibited from burn pits."[329] However, in one instance the presence of "strong leadership and adequate resources" enhanced a base's ability to comply with CENTCOM Regulation 200-2 in spite of obstacles.[330] As recently as December 2013, the media reported, notwithstanding the military's outlay of $5.4 million for modern incinerators over the past two years to eliminate the use of open burn pits in Afghanistan, many of these incinerators sit idle while burn pits continue to be used in contravention of law and regulation.[331] As a result, even more military

322 10 U.S.C. § 2701.

323 GAO REPORT 11-63, *supra* note 110, at 13 (citing U.S. DEP'T OF DEF., DIRECTIVE-TYPE MEMORANDUM (DTM) 09-032: USE OF OPEN-AIR BURN PITS IN CONTINGENCY OPERATIONS 1 (2010), *available at* http://www.dod.mil/pubs/foi/administration_and_Management/admin_matters/12-F-1130_Directive-type_Memorandum_DTM_09-032-_Use_of_Open-air_Burn_Pits_in_Contingency_Operations.pdf.

324 *See* CENT. COMMAND, REG. 200-2, ENVIRONMENTAL QUALITY: CENTCOM CONTINGENCY ENVIRONMENTAL STANDARDS ¶ 1-1 (2012); GAO REPORT 11-63, *supra* note 110, at 12 (explaining that regulation 200-2 was issued in September 2009 by CENTCOM). CENTCOM is the headquarters for U.S. forces in the Middle East, overseeing Afghanistan and Iraq. *Id.* at 5.

325 GAO REPORT 11-63, *supra* note 110, at 12.

326 *See id.* at 12.

327 *Id.* at 3, 16.

328 *Id.* at 19–20.

329 *Id.* at 19.

330 *Id.* at 21.

331 Beth Ford Roth, *Report: US Military Used Dangerous Burn Pits in Afghanistan, Wasted Millions on Broken Incinerators*, KPBS, Dec. 16, 2013, http://www.kpbs.org/news/2013/dec/16/report-burn-pits-afghanistan-incinerators-sigar/ (last visited Feb. 14, 2015); *see also* SPECIAL

personnel are exposed to toxic smoke, potentially leading to "long-term health risks for camp personnel, including reduced lung function and exacerbated chronic illnesses, ranging from asthma to chronic obstructive pulmonary disease."[332]

In addition to Defense Instructions and Defense Directives, each service publishes internal environmental regulations designed for the garrison environment. For example, the Army's main environmental compliance regulation, Army Regulation (AR) 200-1, directs Garrison Commanders to "anticipate and allow for mission surge conditions that could result during times of national security emergencies, including but not limited to contingency operations. [W]here mission surge conditions could potentially exceed permit limitations or other environmental requirements, the [Government Commander] should request an exemption . . . ."[333] Garrison commanders command permanent installations rather than FOBs and COBs.[334] The regulation adds that some guidance does not apply to deployed or contingency operations, including important areas such as planning and implementation, emergency preparedness and response, pollution prevention, and environmental cleanup.[335] There are no analogous regulations to AR 200-1 for the deployed environment.[336] This lapse is particularly striking when one considers the Army would be most in need of guidance regarding environmental issues in contingency operations, given its position as the largest of the four services, and the one most likely to be charged with waste disposal operations at forward operating bases in theater.[337]

A survey by the U.S. Army Corps of Engineers of applicable Army environmental guidance found that guidance addressed discrete situations rather than providing an overarching system to deal with environmental harm; as a result, many tactical units were left to deal with such situations on an ad hoc basis.[338] Air Force, Navy, and Marine policies and regulations were found to have similar deficiencies.[339] The survey concluded, "[a] majority of the documents that directly and indirectly apply to contingency operation sustainability referred either to issues associated with

INSPECTOR GEN. FOR AFGHANISTAN RECONSTRUCTION (SIGAR), SIGAR 14-13 INSPECTION REPORT, FORWARD OPERATING BASE SHARANA: POOR PLANNING AND CONSTRUCTION RESULTED IN $5.4 MILLION SPENT FOR INOPERABLE INCINERATORS AND CONTINUED USE OF OPEN BURN PITS 1,3,6 (Dec. 16, 2013), *available at* http://www.sigar.mil/pdf/inspections/sigar_14-13_inspection_sharana%20incinerators.pdf (discussing results of SIGAR's inspection of incinerators in Afghanistan that cost $5.4 million and are unable to be used).

332 Roth, *supra* note 331.

333 U.S. DEP'T OF ARMY, REG. 200-1, ENVIRONMENTAL QUALITY: ENVIRONMENTAL PROTECTION AND ENHANCEMENT 50 (2007) [hereinafter AR 200-1].

334 *See id.* at 12, 51, 107, 110, 115.

335 *Id.* at 15, 17, 30, 37, 51.

336 GREEN WARRIORS, *supra* note 19, at 12, 128.

337 *See id.* at 128–29, 140–42; OFFICE OF THE DEPUTY UNDER SEC'Y OF DEF., U.S. DEP'T OF DEF., 2011 DEMOGRAPHICS: PROFILE OF THE MILITARY COMMUNITY iii (2012), *available at* http://www.militaryonesource.mil/12038/MOS/Reports/2011_Demographics_Report.pdf.

338 KROOKS & KINNEVAN, *supra* note 10, at vii.

339 *See id.* at 53–54.

environmental safety and occupational health, such as pest and vector control, or dealt with CONUS requirements that were vague in how they should be applied to contingency operations."[340]

While operational deployments remain largely exempt from environmental regulation, a number of publications serve as guidance. For example, Joint Publication 4-04 and Field Manual 3-34.5 both suggest using the OEBGD as a method of establishing minimum environmental standards in contingency operations.[341] The latest version of Field Manual 3-34.5 introduces the concept of an "environmental ethic," defined as "taking care of the environment because it is the right thing to do; this ethic is the operating principle and value that governs individual Soldiers, units, and the Army."[342]

In the absence of law and regulatory guidance, the in-theater commander is largely responsible for deciding what, if any, environmental considerations will apply in a contingency environment.[343] The primary instruments of executing guidance in theater are SOPs and operations orders. An Army survey of applicable guidance found Annex L, the designated annex for environmental considerations in operations orders, is "the single most important source for environmental compliance obligations for US forces who are participating in [overseas] contingency operations."[344] Annex L is meant to implement and integrate baseline guidance, DOD issuances, environmental safety guidelines, and the opinion of health services or environmental officers as sources for environmental requirements, thereby serving as a gap-filler for missing policy.[345] Unfortunately, too often the inclusion of Annex L in operations orders is cut and pasted from higher headquarters directives that are overly broad or ill-suited for the operation in question.[346]

In addition to largely inapplicable Defense Directives and Defense Instructions, and outdated or unsuitable operations orders, commanders must rely on international agreements for environmental guidance in contingency environments.[347] The Iraq SOFA contains a single reference consisting of two sentences on environmental protections, basically affirming the United States' "commitment to respecting applicable Iraqi environmental laws, regulations, and standards."[348] The Afghan version of

340 *Id.* at 4.

341 JOINT CHIEFS OF STAFF, JOINT PUBLICATION 4-04: JOINT DOCTRINE FOR CIVIL ENGINEERING SUPPORT, at VI-1 (2001) [hereinafter J.P. 4-04]; FM 3-34.5, *supra* note 289, § 1-21; GREEN WARRIORS, *supra* note 19, at 29.

342 FM 3-34.5, *supra* note 289, § 1-23.

343 *Id.* §§ 4-1, 4-2 (discussing the commander's responsibility to make environmental decisions in the field).

344 KROOKS & KINNEVAN, *supra* note 10, at 3.

345 *See id.*

346 *See id.* at vii.

347 J.P. 4-04, *supra* note 341, at VI-1.

348 Agreement Between the United States of America and the Republic of Iraq on the Withdrawal of United States Forces from Iraq and the Organization of Their Activities During Their Temporary Presence in Iraq, art. 8, Nov. 17, 2008 [hereinafter Security Agreement], *available at* http://www.state.gov/documents/organization/122074.pdf.

this document, known as the "Strategic Partnership Agreement," contains no provisions for protecting the environment, only a commitment to develop natural resources.[349] Oftentimes in regions in conflict there is no government with which to make an agreement, leaving decisions on incorporating and implementing environmental standards largely to the in-theater commander and his staff.[350]

V. CAUSES OF ACTION

In the absence of applicable international agreements, what recourse do Iraqi and Afghan citizens have should the United States leave behind environmental damage? One tool often employed by the military in contingency operations is the Foreign Claims Act (FCA),[351] passed by Congress in 1942 to "promote and to maintain friendly relations [with foreign nationals] through the prompt settlement of meritorious claims" for property loss, injury, or death caused by servicemembers or civilians deployed overseas.[352] Claims made under the FCA are compensable provided the claims result from the negligent or wrongful acts or omissions of U.S. military personnel engaged in noncombat activities.[353] Though limited to noncombat activities, the FCA is the most widely used claims statute in foreign deployments of military personnel, including those areas considered to be war zones.[354] Today's combat deployments involve a wide variety of activities beyond killing the enemy, and these activities may cause environmental damage.[355] Consider the daily operations of an FOB: depending on the context, everything from solid waste disposal to convoys traveling to another FOB could potentially give rise to a claim under the FCA.

The FCA does have limitations. First of all, the FCA is limited to noncombat activities and therefore would not cover collateral damage from the ordinary destruction of combat, such as damage from an aerial bombardment or the targeting of a dual-use target.[356] Persons harmed by UXO from cluster munitions would likely be unable to file a claim under the FCA. There is an "in scope" requirement for foreign nationals hired in the country where the incident occurred while working for the United States, though there is no scope of employment requirement for U.S. military personnel.[357] Therefore, it would be difficult to demonstrate that a local

349 Enduring Strategic Partnership Agreement Between the United States of America and the Islamic Republic of Afghanistan, at 5–6, May 2, 2012, *available at* http://www.whitehouse.gov/sites/default/files/2012.06.01u.s.-afghanistanspasignedtext.pdf.

350 GREEN WARRIORS, *supra* note 19, at 21–25.

351 Foreign Claims Act, ch. 645, 55 Stat. 880 (1942) (codified at 10 U.S.C. § 2734(a) (2012)).

352 *Id.*

353 32 C.F.R. 536.137(a) (2012).

354 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 301.

355 *See* PROTECTING THE ENVIRONMENT, *supra* note 11, at 8.

356 10 U.S.C. § 2734(a) (2012) (limiting recovery under the FCA to damage that is "caused by, or is otherwise incident to noncombat activities of the armed forces").

357 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 295.

national contractor who chooses to resell hazardous waste at the local scrap market, rather than properly dispose of it, was acting within the scope of his employment. Under the Army regulation dealing with such claims, FCA claims must be presented to the United States or other authorized officials within two years of accrual.[358] Given the United States' withdrawal from Iraq in December 2011, Iraqi citizens would currently be ineligible to file a claim for U.S. environmental damage.

FCA claims are investigated and adjudicated by U.S. military officers appointed to a Foreign Claims Commission, which applies the local law or custom to determine liability and damages.[359] Punitive damages are not available under the FCA.[360] No payments may be made "unless the amount tendered is accepted by the claimant in full satisfaction," with the maximum discretionary award being $100,000.[361] One drawback to the FCA is the use of local law in determining liability and negligence, which inevitably leads to a "host of challenging legal, gender, and ethnic issues" that may conflict with the values of the ordinary American taxpayer.[362] For instance, the loss of life through military negligence under the FCA generates a payment of $15,000 in Afghanistan, while brain damage incurred by an Australian woman hit by a golf ball on a U.S. military golf course warrants payments of $1,000,000.[363] The death of a Somalian woman results in half the compensation for that of a Somalian man.[364]

What about claims by host governments? After all, the default position of the DOD is that international agreements supersede any DOD policy or regulation.[365] Generally speaking, under the International Agreement Claims Act,[366] the FCA does not apply in foreign countries where the United States has a preexisting agreement providing for the "settlement or adjudication . . . of claims against the United States arising out of the acts or omissions of a member or civilian employee of an armed force of the United States."[367] Such instances are generally handled under provisions of the SOFA between the United States and the foreign country.[368] Under the Iraq–U.S. SOFA, Article 21 provides for a waiver of intergovernmental claims arising from "damage, loss, or destruction of property, or compensation for injuries or deaths that could happen to members of the force or civilian component of either Party arising out of the performance of their official duties in Iraq."[369]

358 U.S. DEP'T. OF ARMY, REG. 27-20, LEGAL SERVICES: CLAIMS § 2-5 (2008) [hereinafter AR 27-20]; 10 U.S.C. § 2734(b).

359 OPERATIONAL LAW HANDBOOK, *supra* note 205, at 296.

360 *Id.*

361 10 U.S.C. § 2734(d)–(e).

362 Sameit, *supra* note 74, at 565.

363 *Id.* at 566.

364 *Id.*

365 *See* OPERATIONAL LAW HANDBOOK, *supra* note 205, at 326 ("In all cases, DOD will follow applicable international agreements that require remediation.").

366 10 U.S.C. §§ 2734a–2734b (2012).

367 *See, e.g.*, David P. Stephenson, *An Introduction to the Payment of Claims Under the Foreign and International Agreement Claims Act*, 31 A.F. L. REV. 191, 191 (1994).

368 *See* OPERATIONAL LAW HANDBOOK, *supra* note 205, at 121, 276, 296.

369 Security Agreement, *supra* note 348, art. 21.

The Iraq–U.S. SOFA demonstrates several flaws underlying reliance on international agreements to address environmental concerns. Overall, participating parties are usually more concerned with politically sensitive issues, such as basing rights and troop numbers, and only rarely address environmental damage[370] or the inherent power differential between the United States and practically any other country where contingency operations may occur.[371] As the Army Environmental Policy Institute observed, "[l]ooking back at the last two decades, the U.S. Army has been deployed primarily to countries deeply in crisis (e.g., Somalia, Afghanistan, Iraq). All these crises have had an environmental component from either direct military action or other causes."[372]

Though some commentators view U.S. efforts as inadequate, the U.S. military has taken steps to address environmental damage in post-conflict areas. One method used to address some preexisting environmental issues and those caused by combat activities is the Commander's Emergency Response Program (CERP).[373] Originally designed to respond to "urgent humanitarian relief and reconstruction requirements," the scope of CERP was expanded to include civil works projects, including dams and other infrastructure damaged in combat operations.[374] In 2011, approximately $3.2 billion was appropriated for support in Afghanistan.[375] The CERP program has been criticized for its management at the tactical, rather than the strategic level.[376] Without an overarching strategy, environmental problems are addressed in a haphazard manner, largely dependent on the desires of the local government, sheik, or tribal leader.[377] Furthermore, only a small percentage of CERP funds go toward repairing environmental damage, and only in instances necessary to address damage to preexisting infrastructure.[378]

370 *See id.* arts. 5–6, 8–9 (demonstrating that the SOFA includes merely one short article addressing environmental protection, as opposed to lengthier articles on "Property Ownership," "Use of Agreed Facilities and Areas," and "Movement of Vehicles, Vessels, and Aircraft").

371 See Richard H. Steinberg, *Great Power Management of the World Trading System: A Transatlantic Strategy for Liberal Multilateralism*, 29 LAW & POL'Y INT'L BUS. 205, 206 (1998) (advocating the use of the "great power management approach" to pursue desirable trade arrangements).

372 UNEP REVIEW, *supra* note 77, at 17–18.

373 *See* OPERATIONAL LAW HANDBOOK, *supra* note 205, at 238.

374 *See id.* at 246–47.

375 INSPECTOR GEN., U.S. DEP'T OF DEF., REP. NO. DODIG-2012-023, MANAGEMENT IMPROVEMENTS NEEDED IN COMMANDER'S EMERGENCY RESPONSE PROGRAM IN AFGHANISTAN 1 (2011), *available at* http://www.DODig.mil/audit/reports/fy12/DODIG-2012-023.pdf.

376 *See generally* Heidi Lynn Osterhout, *No More "Mad Money": Salvaging the Commander's Emergency Response Program*, 40 PUB. CONT. L.J. 935, 951–52 (2010) (recognizing that although CERP has overall been considered an operational success, there are concerns about the standards for how CERP funding should be used).

377 *See generally id.* at 966–67 (acknowledging that because CERP is not uniformly governed like the Federal Acquisition Regulation there is corruption and bribing of local officials through CERP funds).

378 *See* INSPECTOR GEN., U.S. DEP'T OF DEF., REPORT NO. DODIG-2012-23, MANAGEMENT IMPROVEMENTS NEEDED IN COMMANDER'S EMERGENCY RESPONSE PROGRAM IN AFGHANISTAN

Between 2004 and 2009, 61% of CERP funds were spent on the transportation and storage sector, mainly on road construction.[379] Three percent was spent on water supply and basic sanitation.[380] Even in 2012, only an estimated 27% of Afghan households had access to clean drinking water.[381] Recently, CERP largely fell out of favor due to congressional concerns over lack of oversight, ever-higher approval authorities, and changing methods of providing aid to the Afghan government.[382]

Complicating issues of environmental damage and remediation are the preexisting conditions of countries subject to contingency operations. Many of Afghanistan's environmental concerns predate the U.S. occupation. For example, even before Soviet tanks rolled across the Afghan border in 1979, widespread illegal harvesting and uncontrolled grazing severely depleted Afghanistan's forests.[383] Decades of conflict predating Operation Enduring Freedom deprived Afghanistan of a stable government, resulting in a severe lack of basic services for clean drinking water and basic sanitation.[384] An estimated ten to thirty million Soviet landmines dot the countryside, contaminating thousands of acres of arable land.[385] Dust and vehicle emissions, combined with the use of open fires—often burning noxious materials—for heating and cooking have led to severe air pollution in many of Afghanistan's largest cities.[386] In the capital city of Kabul, "waste dumps, chemicals and open sewers" cause considerable public health risks even after billions in foreign aid spent on reconstruction.[387]

Iraq faced similar challenges under Saddam Hussein, who has been called an "eco-criminal" for his "stunning record of environmental ruin."[388]

Appendix D: CERP Project Categories, *available at* http://www.dodig.mil/audit/reports/fy12/DODIG-2012-023.pdf.

379 Gregory Johnson et al., *The Commanders Emergency Response Program in Afghanistan: Refining U.S. Military Capabilities in Stability and In-Conflict Development Activities* 11 (Ctr. for Global Dev., Working Paper No. 265, 2011), *available at* http://www.cgdev.org/sites/default/files/1425397_file_Johnson_Ramachandran_Walz_CERP_FINAL.pdf.

380 *Id.*

381 Lisa Hook, *The Future of Afghanistan's Natural Resources*, THE ASIA FOUND., Apr. 18, 2012, http://asiafoundation.org/in-asia/2012/04/18/the-future-of-afghanistans-natural-resources/ (last visited Feb. 14, 2015).

382 *See* Osterhout, *supra* note 376, at 952 (noting congressional criticisms regarding use of CERP funds).

383 John Schroder, *Afghanistan's Development and Functionality: Renewing a Collapsed State*, 70 GEOJOURNAL 95, 97 (2007).

384 *See* U.N. ENV'T PROGRAMME, UNEP IN AFGHANISTAN: LAYING THE FOUNDATIONS FOR SUSTAINABLE DEVELOPMENT 4–5, 22 (2009).

385 THE ARMS PROJECT OF HUMAN RIGHTS WATCH & PHYSICIANS FOR HUMAN RIGHTS, LANDMINES: A DEADLY LEGACY 145 (1993).

386 Laura Lynch, *In Kabul, Death Toll from Dirty Air Rivals that of War*, PUB. RADIO INT'L, Apr. 23, 2012, http://www.pri.org/stories/2012-04-23/kabul-death-toll-dirty-air-rivals-war (last visited Feb. 14, 2015).

387 U.N. ENV'T PROGRAMME, AFGHANISTAN: POST-CONFLICT ENVIRONMENTAL ASSESSMENT 10–11 (2003), *available at* http://postconflict.unep.ch/publications/afghanistanpcajanuary2003.pdf.

388 Jonathan Adler, *Saddam Hussein, Eco-Criminal*, NAT'L REV., March 21, 2003, http://www.nationalreview.com/articles/206256/saddam-hussein-eco-criminal/jonathan-h-adler (last visited Feb. 14, 2015).

Hussein often damaged the environment to punish his adversaries, as he did when he drained 6,000 square miles of environmentally sensitive wetlands in southern Iraq in order to starve his enemies.[389] U.S. efforts to mitigate its own environmental damage in Iraq were often expensive and ineffective. In one instance U.S. soldiers struggled to clean an oil spill and contaminated soil around a single generator in an operations center in Basra being transferred to the Iraqi Army.[390] The total cost to remove and dispose of the contaminated soil was almost $10,000.[391] After spending over $6 trillion on the wars in Iraq and Afghanistan, enough to give every U.S. household $75,000,[392] the U.S. taxpayer rightfully wants to know: how much more is environmental stewardship going to cost?

VI. PROPOSED SOLUTIONS

In 2008 the RAND Study concluded that failure to plan for environmental contingencies and hazardous waste management substantially impacted current contingency operations.[393] The study found "environmental considerations are not well incorporated into Army planning or operations in any phase of an operation" even though such considerations are vital to achieving U.S. aims in contingency operations; environmental destruction can ultimately impact the health, safety, and welfare of U.S. servicemembers and local nationals while dramatically increasing the cost of the operation if overlooked.[394] Such failures are not only damaging to the U.S. mission and reputation, but are a betrayal of our moral obligations and the people we claim to be defending. This Part discusses what steps DOD can take to incorporate environmental planning into future contingency operations, while at the same time addressing lingering issues from our recent operations in Iraq and Afghanistan.

A primary concern highlighted by the RAND Study was the U.S. Army's failure to inculcate environmental planning into Army culture or service norms.[395] This weakness is endemic to all four services, which rightfully see their primary mission as "provid[ing] the military forces needed to deter war

389 Michael Wood, *Saddam Drains the Life of Marsh Arabs*, THE INDEP., Aug. 28, 1993, http://www.independent.co.uk/news/world/saddam-drains-the-life-of-the-marsh-arabs-the-arabs-of-southern-iraq-cannot-endure-their-villages-being-bombed-and-their-land-being-poisoned-and-are-seeking-refuge-in-iran-michael-wood-reports-from-huwaiza-marsh-on-the-death-of-a-5000yearold-culture-1463823.html (last visited Feb. 14, 2015).

390 Dina Maron, *Pentagon Weighs Cleanups as It Plans Iraq Exit*, N.Y. TIMES, Jan. 13, 2010, http://www.nytimes.com/gwire/2010/01/13/13greenwire-pentagon-weighs-cleanups-as-it-plans-iraq-exit-21915.html?pagewanted=all (last visited Feb. 14, 2015).

391 *Id.*

392 Sabir Shah, *US Wars in Afghanistan, Iraq to Cost $6 Trillion*, GLOBAL RES., Sept. 20, 2013, http://www.globalresearch.ca/us-wars-in-afghanistan-iraq-to-cost-6-trillion/5350789 (last visited Feb. 14, 2015).

393 GREEN WARRIORS, *supra* note 19, at iii–iv.

394 *Id.*

395 *See id.*

and to protect the security of our country."[396] The title of one article in *Joint Force Quarterly*, a publication read by many senior defense leaders, reveals the prevailing attitude about the environment and warfare: "Environmental Planning While Deployed: Mission Hindrance or Enhancement?"[397] While the article overwhelmingly makes the case for incorporating environmental considerations in all types of operational planning, it also notes the widespread failure to do so at both the tactical and strategic levels.[398] The same article discusses the abundance of doctrine and policy requiring military planners to consider environmental protection during contingency operations.[399] However, as cleanup issues associated with closing FOBs and ranges in Afghanistan indicate, environmental concerns are often an afterthought.

One solution suggested by the RAND Study is a "cultural change" related to how environmental issues are viewed during contingency operations.[400] Fundamental to this transition is the incorporation of environmental planning into each phase of operational planning, from pre-conflict to stabilization and redeployment.[401] Though critics may scoff and say environmental planning is incompatible with the concept of modern warfare, short of total war most U.S. military operations allow some latitude regarding targeting, basing, and other environmentally relevant decisions. Both the RAND Study and the *Joint Force Quarterly* article mention the failure of many battlefield commanders to include either environmental planning personnel or preventive medicine personnel when establishing FOB locations.[402] Negative consequences resulting from these lapses include the complete dismantling and relocation of an FOB due to environmental hazards unaccounted for in mission planning.[403] In another instance, failure to properly clean up hazardous waste led to a personnel sleeping area being hastily dismantled after it was discovered to lie on top a site of a 300-gallon fuel spill.[404] Additionally, failure to account for everyday waste disposal contributed to the widespread and continuing use of burn pits that are now accused of sickening many contingency personnel.[405]

Incorporating environmental planning into military culture may be easier than it first appears. An analogy may be drawn to the integration of legal counsel into target planning and acquisition in order to ensure

396 U.S. Dep't of Def., *About the Department of Defense (DOD)*, http://www.defense.gov/about/ (last visited Feb. 14, 2015).

397 LeeAnn Racz et al., *Environmental Planning While Deployed: Mission Hindrance or Enhancement?*, JOINT FORCE Q., July 2013, at 30, *available at* http://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-70/JFQ-70_30-33_Racz-et-al.pdf.

398 *See generally id.* (discussing several strategic and tactical reasons for environmental consideration in operational planning, and providing multiple examples where this was poorly done).

399 *Id.* at 31.

400 GREEN WARRIORS, *supra* note 19, at xvii–xviii.

401 *Id.* at xviii.

402 *Id.* at xvii, 135; Racz et al., *supra* note 397, at 31.

403 Racz et al., *supra* note 397, at 31.

404 GREEN WARRIORS, *supra* note 19, at 82.

405 Racz et al., *supra* note 397, at 31.

compliance with international law, which is a relatively recent development.[406] In 1983, military lawyers were not involved at all in the planning and rules of engagement for Operation Urgent Fury in Grenada; however, by 1991 the participation of Judge Advocates in targeting as well as other operational decisions became commonplace.[407] Commanders found the value of soldier–lawyers was the addition of recommendations and information regarding law of armed conflict that may not have been readily available to the commander otherwise, thereby adding legitimacy to targeting decisions.[408] Though change has been slow, most savvy commanders would not consider planning an operation without the input of an operational lawyer. Therefore, cultural and operational change is possible.

Unlike operational law issues, which arise primarily in armed conflict and are therefore not part of a commander's day-to-day existence, all commanders are familiar with meeting environmental requirements in garrison. Whether it be state and local hazardous waste permitting requirements, executive orders, or Defense Instructions, any commander assigned to a fixed military installation either in the United States or overseas is acquainted with the existence of and compliance with environmental regulations.[409] Though standards may not be as high as those for the United States or overseas fixed installations, there is no excuse for not establishing a minimum standard for operations in contingency areas, particularly in long-term operations.

Deficiencies arise in part because of a legalistic hand wave mentality on the part of military leaders; often commanders see themselves as being covered as long as they include Annex L in their operations orders, regardless of practical application or intent to execute.[410] While Annex L is included at the strategic level by combatant commands, by the time an operations order reaches a tactical commander, Annex L is either nonexistent or so vague and overbroad as to be meaningless.[411] Additionally, the RAND Study found operations orders, "focus primarily on the force-sustainment aspects of the environment and say little, if anything, about strategic aspects of environmental considerations or their importance in the post-conflict phases of an operation."[412] Failure to emphasize environmental issues and hold leaders accountable results in lackadaisical oversight and repetition of mistakes made by contingency operations in the Balkans years ago.[413] Unless and until environmental issues are highlighted by leadership,

406 *See* FREDERIC L. BORCH, JUDGE ADVOCATES IN COMBAT: ARMY LAWYERS IN MILITARY OPERATIONS FROM VIETNAM TO HAITI 313–14 (2001) (summarizing the remarkable transformation of the role of Army lawyers from 1959 to 1996).

407 *Id.* at 63–64, 166–67.

408 *See, e.g.*, *id.* at 166–70 (providing examples where commanders relied on solider–lawyers to address the legality of military targets by correctly applying Law of War rules and policies).

409 *See* GREEN WARRIORS, *supra* note 19, at 128.

410 *Id.* at 69–70.

411 Racz et al., *supra* note 397, at 31.

412 GREEN WARRIORS, *supra* note 19, at 68.

413 *Id.* at 112–13.

as part of a leader's fundamental duties, the military will continue to have commanders making statements like: "We're in the desert. What does it matter?"[414]

Such nonchalance means commanders and soldiers often do not consider the second- and third-order effects of improper waste disposal. They view their FOB and its environs as a temporary home for a six-, twelve-, or fifteen-month deployment, not as a homestead where farmers must cultivate crops and children walk to school.[415] This bifurcation results in a lackadaisical attitude allowing firing ranges to be abandoned with UXO buried in the ground and petroleum, oils, and lubricant products to be dumped on-site.

The RAND Study observes environmental conditions differ markedly in contingency operations than garrison environments.[416] While servicemembers in the United States and abroad at fixed installations have robust support to deal with environmental issues, in a contingency environment the absence of environmental regulation often combines with a preexisting degraded environment.[417] These conditions are further complicated by the immediate danger of combat zones. However, managing the rigors of combat while at the same time taking environmental needs into consideration is not completely alien to combatant commanders. For example, in Annex L of the Operation Iraqi Freedom operations order, the inherent conflict between environmental compliance and military expediency is addressed thusly:

> In the combat arena, environmental considerations will always be subordinated to the preservation of human life and force protection. However, this does not mean that the preservation of the natural environment may be ignored in the execution of orders generated from this Plan or in the development of branch, sequel, or subordinate plans.[418]

Preservation of the environment does not have to come at the risk of mission failure. The excuses of *we are not here that long* or *it was like that when we got here* falls short when current wars last over a decade. It stands to reason that with the architecture, expertise, and education already in place in garrison environments, all that is left to do for the U.S. military is to: 1) educate leaders such that environmental protection is as much part of the process of going to war as other operational planning; 2) have real and lasting consequences for those who neglect to do so; 3) ensure environmental experts are integrated into the operations order process all the way from the strategic to the tactical level so Annex L at the tactical level is both meaningful and practical; 4) change existing doctrine, policies,

414 Kennedy, *supra* note 111.

415 *See generally id.* (asserting that troops have little training or knowledge about environmental hazards in the field, and enforcement of environmental rules is lax due to time constraints).

416 *See* GREEN WARRIORS, *supra* note 19, at 4.

417 *Id.*

418 *Id.* at 69 (quotation marks and citation omitted).

and regulations to include minimum environmental standards for contingency operations, including post-operative cleanup, particularly including UXO disposal; 5) allocate funds up front to provide for post-conflict hazardous waste cleanup; and 6) train contracting officers and contracting officer representatives to monitor the use of contractors in hazardous waste disposal and cleanup.

As recent efforts to address military sexual assault[419] and suicide[420] demonstrate, once military leaders turn their attention to an issue, subordinate leaders generally fall in line. The same expertise and resources can be devoted to environmental stewardship. By integrating environmental stewardship into initial entry military training and reinforcing it at professional schools throughout a servicemember's career, the military can begin to change its focus from remediation to prevention. Forcing commanders to allocate financial resources to remediate environmental damage caused by U.S. military operations will compel commanders to account for environmental damage when considering the costs and benefits of an operation. Putting teeth into regulations by creating baseline standards and establishing punitive measures should commanders fall short would end the short-term, *not my problem* mentality that accompanies deployments lasting between thirty days and fifteen months. It would mean commanders assuming command of an FOB or an area of responsibility would compel their predecessors to ensure all lingering environmental hazards are addressed; it would also force commanders occupying an area for the first time to carefully survey and account for all preexisting environmental hazards so their successors could not blame them for preexisting conditions. Part of determining whether or not an area is secure enough to turn over to local national forces should include an assessment of UXO and possible DU hazards left behind by U.S. forces, combined with cleanup if necessary; it is ludicrous to consider an area safe enough for withdrawal of military personnel if children are not safe from leftover U.S. munitions. Monitoring contractors for actual adherence to environmental standards contained in military contracts and fining those who fail to do so will oblige contractors to care as leaders do.

More broadly speaking, the United States must restore its moral leadership by addressing environmental concerns caused by the deployment and operations of its military. A *Foreign Affairs* magazine article observes that one of the many negative consequences of wars in Iraq and Afghanistan, includes "alienating the rest of the world through assertions of infallibility and demand[ing] obedience,"[421] which has damaged American credibility and

419 *See generally* Lisa M. Schenck, *Sex Offenses Under Military Law: Will the Recent Changes in the Uniform Code of Military Justice Re-Traumatize Sexual Assault Survivors in the Courtroom?*, 11 OHIO ST. J. CRIM. L. 439, 440 (2014) (asserting that the recent congressional push to address sexual assault in the military is not adequate).

420 David Wood, *Military and Veteran Suicides Rise Despite Aggressive Prevention Efforts*, HUFFINGTON POST, Aug. 29, 2013, http://www.huffingtonpost.com/2013/08/29/military-veteran-suicides-prevention_n_3791325.html (last visited Feb. 14, 2015).

421 John Edwards, *Reengaging with the World: A Return to Moral Leadership*, FOREIGN AFF., Sept.–Oct. 2007, at 19, 19.

foreign policy objectives. The critical issue for how history judges the U.S. wars in Iraq and Afghanistan will be the conditions we leave behind for the citizens forced to live there. Despite the United States' unwillingness and inability to force Iraqi and Afghan citizens to choose among many competing political factions, it does have the ability and moral obligation to clean up UXO, DU, range detritus, and the hazardous waste left by its own personnel. While the United States might not leave a legacy of peace and democracy, it must strive to leave these places no worse than it found them.

While it may be too late to address the issue in Iraq, the United States still has an opportunity to clean up the bases it occupied in Afghanistan. Even if the security situation does not permit U.S. personnel to clear those areas of UXO, at a minimum the United States has an obligation to provide funds to NGOs, contractors, or the Afghan government to ensure these areas are safe for civilians. The United States and its allies continue to work on cluster munitions with lower failure rates combined with self-destruct mechanisms to address lingering hazards, but these efforts are too far in the future for Afghan and Iraqi civilians suffering in the present.[422] Going forward, accurate mapping of areas hit by U.S. ordnance and planning for eventual cleanup of duds and DU hazards should be a cornerstone of all contingency operations planning short of total war.

The United States must provide some practical means of recourse for those affected by its actions. Recent U.S. military counterinsurgency doctrine places as much emphasis on securing the civilian population as destroying the enemy.[423] Gaining civilian support has become a strategic goal rather than an offshoot of U.S. military operations.[424] Therefore, a fundamental part of ensuring a positive U.S. legacy is to provide a forum and a means to address environmental harm caused by U.S. military activities. A natural starting place would be the expansion of the FCA to include *both* combat and noncombat activity caused by a negligent or wrongful act or omission, caused by U.S. servicemembers, civilians, and contractors.[425] Such an expansion would be in line with the U.S. counterinsurgency strategy of winning hearts and minds in spite of the inevitable collateral damage of combat. The architecture for adjudicating claims up to $100,000 made by local nationals for noncombat claims already exists.[426] Rather than aiding the enemy, dropping the combat exclusion for FCA payments while maintaining the adjudicative architecture would ensure innocent civilians are not turned

422 ANDREW FEICKERT & PAUL K. KERR, CONG. RESEARCH SERV., RS22907, CLUSTER MUNITIONS: BACKGROUND AND ISSUES FOR CONGRESS 5, (2014), *available at* http://fas.org/sgp/crs/weapons/RS22907.pdf.

423 *See generally* U.S. DEP'T OF ARMY, FIELD MANUAL 3-24, COUNTERINSURGENCY § 1-14 (2006) (asserting that while managing insurgents is necessary, priority should be to secure local populations and gain their support).

424 *Id.*

425 *See generally* JONATHAN TRACY, CARR CTR. FOR HUMAN RIGHTS POLICY & CAMPAIGN FOR INNOCENT VICTIMS IN CONFLICT, COMPENSATING CIVILIAN CASUALTIES: "I AM SORRY FOR YOUR LOSS, AND I WISH YOU WELL IN A FREE IRAQ" 3–8 (2008) (asserting the civilian compensation strategy is problematic due to failure to include combat casualties and casualties caused by contractors).

426 10 U.S.C. § 2734 (2012).

toward the enemy's cause due to environmental damage and destruction caused by U.S. forces. Linking such claims within reason to a battlefield commander's budget or evaluation would further incentivize military leaders to avoid environmental damage when they are able, and to carefully consider the costs and benefits when they are not.

VII. CONCLUSION

For far too long the U.S. military has shrouded its environmental destruction in the name of national security and exigent circumstances. Yet, President Obama's *National Security Strategy* calls for American leadership in the environmental arena, specifically identifying climate change as a critical threat to our own national security.[427] The strategy declares, "[a] key source of American leadership throughout our history has been enlightened self-interest."[428] The same principles should apply regarding preventing, mitigating, and remediating U.S. military environmental damage in contingency operations areas. U.S. national security interests are enhanced by establishing and adhering to baseline standards in contingency operations, as well as providing a method of recourse when it fails to meet these standards. More than enlightened self-interest, more than the principle of, *if you break it you buy it*. Cleaning up our own mess is simply the right thing to do.

427 THE WHITE HOUSE, NATIONAL SECURITY STRATEGY 8–9 (2010), *available at* http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf.

428 *Id.* at 3.