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SCOFFLAW

International Law and America's Deadly Weapons in Vietnam

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ABSTRACT

This research uses the Vietnam War as a case study to elucidate and assess state obligations for post-war clean up and reparations for continuing harm against civilians. The cessation of hostilities fifty years ago marked the end of the Vietnam War for U.S. and Viet Cong troops, but to date the War has yet to end for Vietnamese civilians. Much of the ordnance employed by the U.S. military never detonated and remain, to present day, live and buried in and on the soil surface typically exploding upon human contact and injuring or killing unsuspecting children and adults. Since the U.S. troops departed Vietnam in 1973, at least 100,000 Vietnamese children and adults have been injured or killed by such explosions. In addition to ordnance, the contamination of Agent Orange and other herbicides sprayed during the War in concentrations greater than the standard international limit continues to pollute the environment and critically impairs human health.

One focus within this research is the gender-based impacts of war. As the bearers of children and as traditional caregivers, particularly in rural villages where much of the War was fought, women are particularly affected by the continuing effects of war. This research explores how, in the example of Vietnam, women are often at elevated risk of ordnance explosions; why they typically experience social and economic isolation as a result of physical and reproductive health adversities from the abovementioned violence; and how they are at a particular disadvantage when it comes to accessing health and rehabilitation services related to war.

This research documents in detail the extent as well as the psychosocial and economic impacts of the left-behind ordnance and herbicide contamination on civilian populations. It covers variables such as the quantities of ordnance and herbicides deployed by the U.S. during the War, the number of Vietnamese killed and injured by explosive ordnance since the end of the War, the demographics of such victims, the number of civilians exposed to Agent Orange and other toxic herbicides, and the inter-generational human health outcomes of exposure to the chemicals.

This work also addresses obligations the U.S. may have under international law to clean up its weapons and chemical contamination, as well as to provide reparations for victims. To assess state responsibility, the paper presents, examines and analyzes the provisions of four relevant international conventions, considering their entry into force and U.S. ratification status, whether they cover the weapons used in Vietnam, what cleanup obligations they require of states after war, and what reparations obligations the U.S. may be responsible for offering Vietnamese civilians. The paper closes with conclusions about the United States' adherence to international law, and it provides recommendations to the United Nations and the international community regarding U.S. responsibilities under treaty and customary international law.

*Scofflaw: One who ignores or flouts the law,
especially laws difficult to enforce.*

Oxford English Dictionary

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FOREWORD

*Right is only a question between equals. The strong do what they can
and the weak suffer what they must. – Thucydides*

This is a story about a war that never should have happened and what happened after it ended. It also is a story about the rule of international law and how it is undermined when states ignore it. Perhaps above all, this is a story about a remaining agenda for the world community to give international law greater meaning—and meaningful teeth—to help tame an unruly world.

I spent the summer of 2016 in Vietnam conducting field research regarding the extent and impact of civilian exposure to unexploded ordnance and Agent Orange during and after the Vietnam War. Vietnam is a compelling case study, exemplary of the larger issue of state responsibility for post-war cleanup and reparations worldwide. My research has entailed the compilation of both quantitative and qualitative data, including interviews with U.S. war veterans, Vietnamese staff of non-governmental organizations, and review of U.S. and Vietnamese government databases, assessing the location and quantity of Agent Orange sprayed, and the health implications associated with exposure to live ordnance and toxic herbicides.

I also made site visits throughout the country to both Vietnamese and international organizations, conducting interviews with staff to learn about the experiences of victims of chemicals and bombs, and to learn about the involvement and roles of the U.S. and Vietnamese governments in post-war cleanup and reparations. These organizations included the Vietnamese Association for Victims of Agent Orange, Vietnamese Women's Union, Vietnam Veterans for Peace, and Project RENEW, the latter two groups having been founded by returning U.S. veterans. During my field research I also conducted literature reviews of news stories and journal articles pertaining to U.S. involvement in Vietnam, civilian exposure to both unexploded

ordnance and Agent Orange, and the gender- and family-based effects of these exposures. I also researched United Nations databases regarding international treaties and conventions pertaining to state responsibility for the legacy of war.

Two individuals proved to be particularly instrumental in my research. One is Chuck Searcy, an American Vietnam War veteran and the founder of Project RENEW, a Vietnamese organization committed to neutralizing the effects of war. RENEW staff physically (and often perilously) remove unexploded ordnance from heavily-bombed provinces, and conducts community outreach programs to educate local communities about the existence and dangers of unexploded bombs. Searcy, whose work is recognized by the U.S. Congress, was with U.S. military intelligence in Saigon during the War, and is now a full-time resident in Vietnam as well as a leading expert on the aftermath of the conflict.

The other individual is Dr. Jeanne Stellman, Professor Emeritus at Columbia University's Mailman School of Public Health. Stellman specializes in environmental health with particular expertise in exposure to Agent Orange and other herbicides, including those deployed by the U.S. military in Vietnam. In collaboration with her scholar husband, Steven Stellman, she obtained U.S. military records to track herbicide exposures in Vietnam, doing so in conjunction with the National Academy of Sciences and the U.S. Institute of Medicine.

My hope is that this work will contribute to the field of international human rights law in two ways. First, that these findings increase awareness regarding the responsibility states bear for human rights violations pertaining to the legacy of war. State accountability for post-war responsibility—cleanup, destruction of weapons, and reparations for civilians—is an often unexplored and unaddressed topic, certainly among the lay public but also often among policymakers and the international community itself. A second contribution hopefully will be

greater understanding of the long-term consequences of left-behind weapons on civilian victims, and the imperative of responsible parties to adhere to international standards regarding cleanup and reparations. In the case of the Vietnam War, as we shall see, this responsibility now largely rests with the United States of America.

1. WAR WITHOUT END

It is commonly said that war is hell, but only some know the hell that continues long after combat ends.

The perils of military combat have been well-documented, particularly as technological and communications advances illuminate experiences on the battlefield to capture the immediate impact of conflict on both soldiers and civilian populations. But it is less well known that the violence of war typically continues after hostilities cease, with civilian casualties continuing to accrue even decades after warring parties depart the scene of battle.

A key test of the efficacy of international law pertains to state obligations for post-war reparations and cleanup of unexploded ordnance (UXO), munitions, and chemical weapons that typically continue to maim and kill civilians years after the end of armed conflict. While international standards such as the 1949 Geneva Conventions and Additional Protocols long ago established rules governing armed conflict, responsibility for the removal of war remnants and redress for innocent civilians are responsibilities often ignored. With unenforced obligations, responsibility for the aftermath of war often are left to derive from the good-will of the offending state, whether due to altruistic intentions or as an attempt to secure positive world standing. But historical experience reveals that neither motivation has proved sufficient to compel warring parties to accept international responsibility during and after war.

International treaties regarding the legacy of war do exist, but with limited legal muscle due to limitations in the ratification, implementation, and enforcement of treaty law. It is not uncommon, for example, for states to fail to ratify treaties, or to ratify but fail to implement their provisions. This bears relevance particularly to obligations in the aftermath of war, particularly

the cleanup and removal of harmful and even lethal weapons left on foreign soil, or reparations to innocent civilians injured by those weapons.

A key example of the phenomenon of continuing post-war harm is the Vietnam War, the term applied to the U.S. presence in Vietnam starting in the early 1960s and lasting until the departure of U.S. troops in 1973. During this period the U.S. deforested large swaths of Vietnam with highly toxic chemical defoliants and, from 1965- 1973, it also dropped more than five million tons of ordnance throughout the country.¹ When the United States military left Vietnam in 1973, after a decade on the battlefield, it left behind tons of undetonated explosives on Vietnamese soil that continue to maim and kill civilians even today. Moreover, residual levels of toxic herbicides were left in the environment and their effects still impair the health of civilians, including small children and even infants at birth.

U.S. engagement in Vietnam presents a poignant case regarding the application of international law. Prior to the end of the War fewer treaties addressed post-war cleanup. While international standards have developed in the intervening years, compliance with their mandates often is ignored. Whether and how international law applies to U.S. responsibility for post-war cleanup and reparations in Vietnam is the subject of this work, one providing an insight into the even larger issue, namely whether states are free to ignore the status of innocents they harmed, or even to continue to harm them long after combat ends.

¹ James P. Harrison, "History's Heaviest Bombing." In *The Vietnam War: Vietnamese and American Perspectives*, edited by Jayne S. Werner and Luu Doan Huynh (New York: Routledge, 1994), p. 130-139; Michael Clodfelter. *Vietnam in Military Statistics: A History of the Indochina Wars 1772 – 1991* (Jefferson: McFarland and Company, Inc., 1995).

Timeline of U.S. Role Vietnam

Year	Event
1959	First American deaths in Vietnam (2 military advisors)
1960	United States increases advisors (from 327 to 685)
1961	First American combat death
1962	U.S. begins spraying herbicides to defoliate major swaths of South Vietnam
1963	Vietnamese Buddhist monks self-immolate to protest war
1964	Gulf of Tonkin Resolution passes Congress, giving President Johnson power to take any actions deemed necessary to defend South Vietnam from Viet Cong forces. This also was called the Blank Check.
1965	U.S. combat troops arrive in Vietnam. Extensive carpet bombing campaign known as Operation Rolling Thunder is authorized by President Johnson.
1965	First mass anti-war demonstrations in the United States.
1968	My Lai Massacre: American soldiers murder hundreds of civilians.
1969	Peace talks begin in Paris with representatives from the United States, South Vietnam and the NLF (Northern Liberation Front).
1969	President Nixon announces "Vietnamization," a plan for the U.S. to train South Vietnamese troops so they can implement roles that were performed by American troops.
1971	Congress votes to withdraw U.S. troops from Vietnam by end of the year.
1973	Mutual exchange of POWs.
1973	Official end of the U.S. role in Vietnam War (last U.S. soldiers leaves, but military advisors and some Marines remain).
1975	The North Vietnamese take over Saigon, signaling the end of the War.

Source: Vietnam War Statistics and Facts, 25th Aviation Battalion website; Hatfield Group.

The first U.S. troops arrived in Vietnam near an airbase in the central coast city Da Nang on March 8, 1965, where later forces remained for the better part of a decade. The recipe for the perfect storm of events leading to the Vietnam War brewed long before the 1960s, and derived from a combination of lingering vulnerabilities and fears stemming from the aftermath of World War II, and especially from the Cold War itself. The years following the end of the War introduced changes in government leadership and occupation in Vietnam, effectively splitting the country in half between forces claiming self-governance and forces siding with colonial powers seeking to retain control.

After WWII, France reclaimed its colonial toe-hold in Vietnam as the defeated Japanese

departed. Viet forces soon launched a rebellion against French occupation, and Chinese forces supported their struggle by placing soldiers on the border of northern Vietnam. By 1949 the struggle had turned into a conventional anti-colonial war.

In 1954, the Geneva Accords ended what was then known as the French Indochina War by dividing Vietnam along the 17th Parallel, with the North becoming the Democratic Republic of Vietnam under Ho Chi Minh and the South the Republic of Vietnam. This division only led to further conflict as North and South Vietnam, as they became known, fought for sovereignty. The Ho-led forces sought to liberate all of Vietnam from foreign domination, and U.S. forces arrived to protect South Vietnam and greater Southeast Asia from what they viewed as a Communist takeover of the region.

U.S. bombing campaigns in Vietnam began shortly after President Johnson authorized “Operation Rolling Thunder” in February, 1965, following the approval of the Tonkin Gulf Resolution.² The bombing campaign lasted until 1973,³ which marked the departure of the last American soldiers from Vietnam and the official end of U.S. role in the War. United States military advisors including some Marines would remain in-country for another two years, when the 1975 takeover of Saigon by the North Vietnamese signaled the actual end of the long-term conflict over regional control.⁴

In its decade of participation in the War, the U.S. dropped an estimated 7.66 million tons of bombs on Indochina⁵ (Vietnam, Laos and Cambodia combined), three times the amount

² “America Launches Operation Rolling Thunder.” <http://www.history.com/topics/vietnam-war/operation-rolling-thunder>.

³ Kolko. *Anatomy of a War*, p. 457.

⁴ “Minh Surrenders: Viet Cong in Saigon.” *New York Times*. April 30, 1975, p.1.

⁵ James P. Harrison, “History’s Heaviest Bombing, p. 130-139.”

deployed in Europe and the Pacific combined during WWII.⁶ Of the five million tons dropped on Vietnam itself, a notable percentage failed to detonate—estimates put the range at 10% to 30%⁷—and they continue to maim and kill civilians currently. Even after years of de-mining efforts, “... 350 to 800 thousand tons of bombs and mines remain, including high explosive bombs, shrapnel bombs, penetration bombs, missiles, mines, cannon warheads and other explosives.”⁸ The U.S. also planted the soil of Vietnam with landmines and other ordnance, many of which never detonated and remain live, often exploding upon human contact. The injuries and deaths that continue to occur remain largely unrecognized by the international community, now more than forty years after the end of the Vietnam War.⁹

In addition to the unprecedented deployment of ordnance, the U.S. saturated some 4.5 million acres of the Vietnamese countryside¹⁰ with 18 million gallons of toxic herbicides.¹¹ This spraying directly exposed an estimated 4.8 million Vietnamese to dioxin, a derivative compound in Agent Orange that is regarded as one of the most toxic substances known to science.¹² Dioxin

⁶ Ben Kiernan and Taylor Owen, “Making More Enemies Than We Kill? Calculating U.S. Bomb Tonnages Dropped on Laos and Cambodia, and Weighing Their Implications,” *Japan Focus: The Asia-Pacific Journal* 13, no. 17 (2015), p. 1-3.

⁷ Chuck Searcy (founder of Project RENEW) in discussion with the author, July 2016 (citing Department of Defense data); Chuck Searcy, “U.S. Veteran Leads Clean-up of Vietnam War’s Lethal Remnants,” *PBS Newshour* (November 20, 2014) <http://www.pbs.org/newshour/bb/u-s-veteran-leads-clean-vietnam-wars-lethal-remnants>; “Cluster Bomb Fact Sheet,” Legacies of War, http://legaciesofwar.org/resources/cluster-bomb-fact-sheet_p.1.

⁸ “Hard to Clear Post-War Bombs and Mines,” *Vietnam Government Portal: Online Newspaper of the Government*, May 14, 2012, accessed June 21, 2016, http://news.chinhphu.vn/Home/Hard-to-clear-postwar-bombs-and-mines/20125/14389.vgp_p.1.

⁹ International Committee of the Red Cross, “Explosive Remnants of War,” *International Committee of the Red Cross Resource Center*, 2014.

¹⁰ Myra MacPherson, “Voices of Veterans: The Endless Tragedy of Vietnam.” In *The People Make the Peace: Lessons from the Vietnam Antiwar Movement*, edited by Karín Aguilar-San Juan and Frank Joyce (Charlottesville: Just World Books, 2015).

¹¹ Arnold Schechter et al., “Recent Dioxin Contamination from Agent Orange in Residents of a Southern Vietnam City,” *Journal of Occupational and Environmental Medicine* 43, no. 1 (2001), p. 1; Michael F Martin, “U.S. Agent Orange/Dioxin Assistance to Vietnam,” *Congressional Research Service*, 2015, <https://fas.org/sgp/crs/row/R44268.pdf>, p. 1.

¹² Charles Bailey, “Agent Orange: What Efforts Are Being Made to Address the Continuing Impact of Dioxin in Vietnam?” Written testimony prepared for The House Committee on Foreign Affairs Subcommittee on Asia, the Pacific and the Global Environment, Washington, DC, June 2009, p. 7; Annika Johansson and Le Thi Nham Tuyet,

adversely impacts individuals in two ways: through direct exposure which produces serious transgenerational effects by altering human DNA, and indirect exposure which occurs through environmental contamination of crops and seafood.

Given the nature of war, there is variation among authoritative sources about the actual number of military and civilian deaths. Estimates of total deaths among Vietnamese military, for example, range from 666,000¹³ to 950,765.¹⁴ The range of civilian deaths is even wider, reflecting U.S. government estimates of 30,000¹⁵, scholarly estimates of 405,000¹⁶, and even as high as 2 million according to other scholars.¹⁷ Various authoritative sources put the number of American military deaths at a minimum of 58,000.¹⁸

In a dramatic and intense period during early 1973, largely due to widespread anti-war sentiment on the part of the American public, the United States government decided to exit Vietnam quickly. It removed all of its combat forces, all of its diplomatic representation, and many of its South Vietnamese allies. But the U.S. removed none of the deadly munitions it had dropped. Its unexploded bombs were left behind as was the lethal residue of herbicides in the Vietnamese soil and waterways.

“Impact of Chemical Warfare with Agent Orange on Women’s Reproductive Lives in Vietnam: A Pilot Study,” *Reproductive Health Matters* 9 no. 18 (2001), p. 156.

¹³ Guenter Lewy, *America in Vietnam*, (New York: Oxford University Press, 1978), p. 453.

¹⁴ This figure is the official U.S. Defense Department estimate, as quoted in Charles Hirschman et al., “Vietnamese Casualties During the American War: A New Estimate,” *Population and Development Review* 21 no. 4 (1995), p. 790.

¹⁵ *The Encyclopedia of the Vietnam War: A Political, Social, and Military History*. 5th edition. Edited by Dr. Spencer Tucker, and Dr. Paul G. Pierpaoli Jr (Santa Barbara: ABC-CLIO, 2011), p. 176.

¹⁶ Lewy, *America in Vietnam*, p. 453.

¹⁷ *The Encyclopedia of the Vietnam War: A Political, Social, and Military History*. 5th edition, p. 176.

¹⁸ National Archives, *Military Records: Statistical Information About Fatal Casualties of the Vietnam War*, accessed June 11, 2016, <http://www.archives.gov/research/military/vietnam-war/casualty-statistics.html>, see “Casualty Category.”

The remaining ordnance and herbicides have maimed and killed civilians throughout the decades following America's departure, and continue to do so today.¹⁹ Children playing in fields find baseball-size pieces of metal which, unbeknownst to them, are cluster bombs. They toss the "baseballs" to one another in spontaneous games of catch until they explode, blowing off arms or legs and even killing children at play.²⁰

An important and often-overlooked component of war, in this case of the Vietnam War, is its gender-based impacts. There are notable differences in the way men and women experience war, as well as how they experience the continuing economic, social, and emotional damage of its aftermath. While civilian populations routinely suffer the effects of armed conflict in their countries, the impact is often experienced differently. Differences in the division of agricultural labor between men and women influence their vulnerability to landmines and put them at differential risks of being maimed or killed by UXO while farming.²¹ Similarly, differences in community responses to male and female victims of UXO often isolate women and jeopardize their marriage prospects. The United Nations Mine Action Service notes that after UXO explosions in agrarian societies, such as those in central Vietnam, "women are perceived as 'damaged' and no longer productive members of society or desirable as a wife, because they can no longer work in the fields."²² Women also experience greater difficulty accessing health and rehabilitation services than men. "Women and children are often the most exposed to landmines,

¹⁹ Judy Gumbo, "Viet Nam Time Travel, 1970 - 2013." In *The People Make the Peace: Lessons from the Vietnam Antiwar Movement*, edited by Karin Aguilar-San Juan and Frank Joyce (Charlottesville: Just World Books, 2015), Chapter 2; Andrew Wells-Dang, "A Regional Approach: Mine and UXO Risk Reduction in Vietnam, Laos and Cambodia," *Journal of Mine Action* no. 9.2 (2013), accessed July 7, 2016, <http://www.jmu.edu/cisr/journal/9.2/focus/wells-dang/wells-dang.shtml>, p. 1.

²⁰ Judy Gumbo, "Viet Nam Time Travel," Chapter 2; Ngo Xuan Hien and Nguyen Thanh Phu (Project RENEW staff) in discussion with the author, July 2016.

²¹ Organization for Economic Cooperation and Development, "Conflict, Peace-Building, Disarmament, Security: Gender Perspectives on Landmines," *United Nations Department of Disarmament Affairs*, 2001, p. 1.

²² United Nations Development Fund for Women, *Women, War, Peace and Landmines*, 2004.

especially if they are primarily responsible for gathering fuel or water... [and]... women are much less likely than children and men to have access both to treatment and to rehabilitation and prostheses.”²³

The long-term impact of exposure to Agent Orange also falls disproportionately on women. Men and women who were exposed to dioxin directly, or whose parents or grandparents were exposed, experience changes to their DNA and often produce children with severe deformities, reflecting genetic impairments which can continue through several generations.²⁴

While both men and women suffer significant adverse health outcomes from exposure to dioxin, women often experience additional burdens such as elevated rates of infertility and miscarriages. For those who do carry babies to term, their children often are born prematurely, and with profound congenital malformations.²⁵ Parenting children with permanent physical or mental disabilities can have serious economic and social consequences for families, particularly for women as mothers and primary caregivers, perhaps even preventing them from working and contributing to family income.²⁶

Ultimately, however, the cost of war is not to be measured in terms of women or men, adults or children, soldiers or civilians, but by its impact on human lives, the pains of the wounded and permanently impaired, the deaths of its victims, and the broken lives of those scorched forever by its impact.

²³ United Nations Development Fund for Women, *Women, War, Peace and Landmines*.

²⁴ Mohan Manikkam et al., “Dioxin (TCDD) Induces Epigenetic Transgenerational Inheritance of Adult Onset Disease and Sperm Epimutations,” *PLoS ONE* 7(9), p. 1, 5, 11; Arnold Schecter et al., “Recent Dioxin Contamination;” p. 442.

²⁵ Johansson and Le, “Impact of Chemical Warfare,” p. 157.

²⁶ Organization for Economic Cooperation and Development, “Conflict, Peace-Building, Disarmament, Security: Gender Perspectives on Landmines,” *United Nations Department of Disarmament Affairs*; Program staff (Vietnam Women’s Union) in discussion with the author, July 2016.

2. FIFTY YEARS OF BOMBS

Substantial political resolve and no shortage of bravado led the United States to unleash a greater array of military might on Vietnam than the world had ever seen before. Perhaps nothing epitomizes U.S. intentions at the time more than the now-infamous 1968 statement of Air Force Chief of Staff, General Curtis LeMay: “We’re going to bomb them back into the Stone Age.”¹

The 7.66 million tons of ordnance the U.S. dropped throughout the narrow, serpent-shaped nation included a potpourri of explosives such as cluster bombs, missiles, grenades, landmines and more. While the term ordnance refers to all types of military equipment, ranging from explosive devices to trucks and airplanes, the term has come to be used primarily with respect to explosive devices. This latter definition will be used herein, at times abbreviated as UXO when referring to unexploded ordnance. (The following table lists the military terms used for this range of military devices).

Of the array of ordnance deployed in Vietnam, a significant percentage did not detonate as intended, and has remained live and deadly for more than forty years. Typically they are submerged in family rice fields and backyard gardens, or scattered in forests, bamboo groves and other areas near children’s footpaths to school.²

Sprinkled throughout the country these life-threatening devices, when exposed, often are assumed to be rocks—“rocks” that explode upon contact with farmers in their fields or children in family gardens.³ Cluster bombs—“the demon seed of modern munitions”⁴—comprise a

¹ Ross Wilson, *The Language of the Past* (New York: Bloomsbury Publishing Place, 2016), p. 61.

² Interview with Ngo Xuan Hien and Nguyen Thanh Phu (Project RENEW staff) in discussion with the author, June 27, 2016.

³ Ngo Xuan Hien and Nguyen Thanh Phu, 2016; Wyatt Olson, “A New Approach to Ridding Vietnam of Unexploded Ordnance,” *Stars and Stripes*, accessed June 27, 2016, <https://www.stripes.com/news/pacific/a-new-approach-to-ridding-vietnam-of-unexploded-ordnance-1.176497#.WOPixqK1tPZ>, p. 2.

⁴ Olson, “A New Approach”, p. 3.

significant proportion of the UXO remaining in Vietnam.⁵ Their prevalence, as well as their size and mechanism of operation, make them, along with unexploded grenades, the leading cause of UXO-related injuries and deaths since the end of the War.⁶

Relevant Military Terms	
<i>Ordnance</i>	All types of military supplies, ranging from weapons and explosives to vehicles, aircraft and artillery.
<i>Munitions</i>	General term for ammunition and armaments (explosive, chemical, nuclear).
<i>UXO and ERW</i>	Unexploded ordnance (UXO) refers to all undetonated explosive weapons (bombs, shells, grenades, mines, cluster bombs), while explosive remnants of war (ERW) includes those detonated as well.
<i>Cluster bombs</i>	Air-dropped or ground-launched explosive weapons that release “sub-munitions” or “bomblets” designed to kill human targets or destroy vehicles and equipment.
<i>Landmines</i>	Explosive devices concealed under- or above-ground to disable or destroy human and other targets when triggered by pressure or a trip wire.
<i>Grenades</i>	Small bomb thrown by hand of three major types: fragmentation (lethal fragments), concussion (explosive power) and anti-tank.
<i>Missile</i>	A self-propelled precision-guided munition (ballistic, cruise or surface-to-air).
<i>Rocket</i>	An unguided missile shot into the air.
	<i>Sources: These terms have been selected because of their relevance to the Vietnam War, and defined by the author based on military records and common usage from a variety of sources.</i>

⁵ Doug Hostetter, “A Pacifist in the War Zone.” In *The People Make the Peace: Lessons from the Vietnam Antiwar Movement*, edited by Karín Aguilar-San Juan and Frank Joyce (Charlottesville: Just World Books, 2015), p. 107 - 120; Olson, “A New Approach”, p. 2; Interview with Chuck Searcy (founder of Project RENEW) in discussion with the author, June 28, 2016.

⁶ Jonathon Guthrie and Portia Stratton, “The Quang Tri Integrated Survey and Clearance Project,” *The Journal of ERW and Mine Action*, 19.1, April 2015, p. 16.

Since the final departure of the U.S. from Vietnam in 1975, more than 100,000 Vietnamese civilians have been injured (60,000) or killed (42,000) by UXO explosions.⁷ Some reports place these figures even higher, including the Vietnam Ministry of Labor, Invalids, and Social Affairs which lists UXO-related injuries alone at 66,000.⁸ As for deaths attributed to UXO, the numbers can be staggering: The number of Vietnamese who have died in UXO-related explosions since the U.S. departure, more than 42,000, is comparable to killing every baseball fan in the 37,949-seat stadium at Boston's Fenway Park. And even today, the number of injuries and deaths continue to mount.

When expanded from Vietnam to include Laos and Cambodia, which the U.S. bombed heavily as well, thousands more have been injured or killed.⁹ Not surprisingly, they are ubiquitous in nature: In central Vietnam alone live ordnance exist on or beneath some 35% of the land, covering some 16 million acres.¹⁰

Altogether, so prevalent is the presence of UXO in Indochina that at the current rate of cleanup it would take three centuries to clear the land of explosives.¹¹ Various military terms, some synonymous and overlapping, are used to describe the types of ordnance. The term "explosive remnants of war" (ERW) is an umbrella term that encompasses all types of explosive ordnance from war—artillery shells, grenades, mortar shells, rockets, and missiles—regardless of

⁷ Ngo Xuan Hien and Nguyen Thanh Phu, 2016; Hostetter, *The People Make the Peace*, p. 107 - 120; The Associated Press, "Vietnam: More than 100,000 Casualties From Explosives Since War Ended," *New York Times*, December 7, 2011.

⁸ Olson, "A New Approach."

⁹ Andrew Wells-Dang, "A Regional Approach: Mine and UXO Risk Reduction in Vietnam, Laos and Cambodia," *Journal of Mine Action* No. 9.2 (2013), accessed July 7, 2016, <http://www.jmu.edu/cisr/journal/9.2/focus/wells-dang/wells-dang.shtml>, p. 3.

¹⁰ Chloe Cunningham, "U.S. and Vietnam Sign Memorandum of Understanding," *The Journal of ERW and Mine Action*, 18.1, Spring 2014, p. 1.

¹¹ "Deputy Defense Minister Nguyen Chi Vinh Talks About VN-US Defense Ties," *Vietnam Net Bridge*, March 3, 2015, <http://english.vietnamnet.vn/fms/special-reports/126759/deputy-defense-minister-nguyen-chi-vinh-talks-about-vn-us-defense-ties.html>, p. 4; Olson, "A New Approach," p. 1.

whether or not they detonated.¹² Unexploded ordnance (UXO) are a subset of ERW that embodies the same types of ordnance, the difference being that UXO refers to ordnance that were “launched, dropped, or otherwise used but have not exploded as intended.”¹³ Of the combined ERW used by the U.S., the predominant share consists of “explosive remnants,” cluster bombs, grenades, missiles, shells, rockets.¹⁴

Cluster bombs themselves contain hundreds of small bomblets the size of baseballs, and were released by aircraft or deployed on the ground via rocket launchers, artillery, and combat vehicles.¹⁵ During the War, cluster bombs typically were deployed by the Air Force on fixed-flight paths, often as a means of clearing space for the spraying of Agent Orange. Because of the manner in which they were dropped, “unexploded [cluster] bombs tend to be found in groups; if you find one, you’re likely to find more.”¹⁶ Each of the hundreds of bomblets within each cluster bomb is small, containing within it thousands of sharp pieces of shrapnel. Each cluster bomb is designed to explode several feet from the ground, dispersing its bomblets and razor-sharp shrapnel over several square meters to maximize its destructive impact on humans.¹⁷

The release of cluster bombs from an aircraft is triggered by the spinning of a dispenser which determines the pattern by which the bombs fall, as well as their orientation to the ground. The bombs fall at the rate of 125 feet per second, exploding close to the ground with the intensity of a pistol bullet and capable of maiming or killing anyone within its radius.¹⁸ “Unlike landmines, which are designed to maim more than to kill, cluster bombs are much more likely to

¹² “Explosive Remnants of War,” *International Committee of the Red Cross Resource Center*, p. 1.

¹³ *Ibid*, p.1.

¹⁴ Wells-Dang, “A Regional Approach”, p. 1.

¹⁵ “Cluster Bombs”, *Handicap International United Kingdom*, accessed July 10, 2016, http://www.handicap-international.us/cluster_bombs, p. 1.

¹⁶ George Black, “The Vietnam War is Still Killing People,” *The New Yorker*, May 20, 2016, p. 3.

¹⁷ “Cluster Bombs”, *Handicap International*, p. 1; George Black, “The Vietnam War is Still Killing People”, p. 3.

¹⁸ “Cluster Bombs,” *Handicap International*, p. 2.

kill and to cause multiple casualties.”¹⁹ But a significant percentage of these ordnance did not detonate as planned, remaining live and lethal after having penetrated the soil and waterways where they remain today.²⁰

For the victims of UXO explosions who do not die on the spot, the impact typically is long-lasting and often permanent. Being maimed by UXO not only alters the physical appearance of a child or adult, but often destroys limbs and tears apart the fabric of families and even communities. The physical pain of an injury, the subsequent loss of work and related economic ramifications, challenges in accessing medical and rehabilitation services, and prolonged emotional trauma, together, produce long-lasting changes in the lives of survivors and families.

The physical impacts from UXO explosions include “fragmentation wounds, burns, punctured eardrums, loss of sight, and amputation of limb(s).”²¹ For many, these physical wounds are exacerbated by future repercussions. Adults and children whose limbs were blown off during the explosion, for instance, experience a series of additional burdens including the fitting of artificial limbs, health and rehabilitation services, and replacement of prosthetic limbs every set number of years.²²

As is common for survivors of trauma, UXO victims typically suffer tremendous psychological stress as well. Many experience shame, depression, and even ostracism resulting from the gravity of the injury itself. Whereas health services and counseling are usually made available to trauma victims, such services often are inaccessible to many Vietnamese survivors

¹⁹ “Cluster Bombs,” *Handicap International*, p. 2.

²⁰ Chuck Searcy, “US Veteran Leads Clean-Up of Vietnam War’s Lethal Remnants,” *PBS Newshour* (November 20, 2014), <http://www.pbs.org/newshour/bb/u-s-veteran-leads-clean-vietnam-wars-lethal-remnants/>.

²¹ “Explosive Remnants of War,” *International Committee of the Red Cross Resource Center*, https://shop.icrc.org/les-restes-explosifs-de-guerre.html?__store=default, p. 4.

²² *Ibid*, p. 4.

due to their remote location.²³

The psychological well-being of victims may be further compounded by sudden changes in employment and financial status. Victims suffer economic disabilities as sustained injury and sudden loss of hands, fingers or limbs may lead to diminished work ability or even no employment at all. Among those disproportionately impacted by UXO explosions are subsistence farmers. In addition to the many other complications that victims experience, these farmers are subjected to additional challenges due to their vulnerable financial status. Moreover, loss of individual and family income makes short- and long-term medical care (surgeries, prosthetic limbs, counselling) challenging for many, but for those living in abject poverty, medical and psychological assistance may be well beyond their means.²⁴

Even the most basic means of survival may become life-threatening, especially for subsistence farmers. Living and working land ridden with UXO substantially compromises the nature of their work, such that “growing crops, transporting goods, and foraging...all [become] risky activities under the circumstances.”²⁵ Left with no alternative, farmers often remain trapped in a Catch-22 in which, dangerous as it may be, “necessity drives [them] to till farmland, despite knowing that they might detonate unseen munitions.”²⁶ With no alternative means of income, subsistence farmers not surprisingly constitute the majority of UXO victims.

The areas of Vietnam most acutely affected by the prevalence of UXO are the South-central Coast and the Central Highlands.²⁷ Nestled in central Vietnam just south of the demilitarized zone that divided North and South Vietnam during the War, and 115 miles north of

²³ Ibid, p. 4.

²⁴ Ibid, p. 5.

²⁵ Ibid, p. 6.

²⁶ Ibid, p. 6.

²⁷ Wells-Dang, “A Regional Approach”, p. 3.

China Beach where U.S. troops first set foot in the country on March 8, 1965, sits Quang Tri province. About 60% of combat fighting occurred in Quang Tri²⁸, rendering it the most heavily-bombed province and now the one with the highest levels of UXO in the country.²⁹

The UXO infestation in Quang Tri presents unique challenges, setting it apart from the rest of the country and contributing to the increased vulnerability of its families. Because the province is largely agricultural with most of its people relying on subsistence farming, families are especially susceptible to UXO explosions. With endemic poverty and a hand-to-mouth lifestyle throughout much of the province, workers often depend upon unreliable means of earning money such as scrap metal collection.³⁰ But with Quang Tri being the most heavily-bombed province in the country, much of the sought-after scrap metal is from UXO. “With no other employment options, adult males living in contaminated areas search for UXO to remove from the ground and sell to local dealers. In some cases children are also involved.”³¹ Indeed, of the thousands of UXO-related deaths in Quang Tri since the end of the War, nearly one-third of the victims have been children.³²

Hundreds of thousands of tons of ordnance were dropped in Quang Tri, alone, and an estimated 83% of the land today remains ridden with UXO.³³ Both during and after the War, unexploded ordnance have impacted local families and communities in enduring ways. Since the end of the War there have been at least 8,000 serious UXO injuries and deaths within the

²⁸ Wendy Waldeck and Sarah Sensamaust, “Vietnam,” *Journal of Mine Action*, No. 9.2 (2006), <http://www.jmu.edu/cisr/journal/9.2/profiles/vietnam/vietnam.shtml>, p. 1.

²⁹ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

³⁰ *Interactions with a Violent Past: Reading Post-Conflict Landscapes in Cambodia, Laos, and Vietnam*, edited by Vatthana Pholsena. and Oliver Tappe (Singapore: National University of Singapore Press, 2013), p. 55.

³¹ Wells-Dang, “A Regional Approach”, p. 2.

³² Ngo Xuan Hien and Nguyen Thanh Phu, 2016; Olson, “A New Approach”, p. 3.

³³ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

province.³⁴ The majority of UXO accidents in Quang Tri have occurred in residential areas (25%), in rural areas (21.84%), in rice fields (11.78%), and in forests (10.78%). Within these locations, cluster bombs are the leading single cause of accidents. The majority of victims of UXO accidents are youth and adults ages sixteen to thirty-five (44.11%), followed by children ages one to fifteen (27.01%), and adults ages thirty-six to fifty-five (25%).³⁵

Over the last sixteen years UXO accidents and casualties in Quang Tri have noticeably declined, reflecting progress largely attributable to the clearance and risk education work of Project RENEW (established by American veteran Chuck Searcy), and its partner teams that remove individual ordnance and conduct local mine risk campaigns about the danger posed by UXO. But because of the large number of ordnance still in the ground, Quang Tri remains at greater risk than many other Vietnamese provinces, standing as a glaring microcosm of the harm that has continued since the U.S. departure.

The U.S. military's extensive seeding of the country with lethal devices largely ended on March 29, 1973, when U.S. combat troops left Vietnam and the War was declared over insofar as American troops were concerned. (The War, itself, would continue for an additional two years while U.S. military advisors remained in country, although U.S. combat forces had departed).

In the immediate years following the U.S. departure from Vietnam, the health and well-being of American veterans was tenuous at best, as their return home brought with it many permanent physical and mental wounds. Soldiers often experienced survivor's guilt, recurring nightmares and other forms of post-traumatic stress disorder (PTSD), with a significant number committing suicide. With many American families attempting to navigate through these

³⁴ Quang Tri Province Legacy of War Coordination Center website, accessed June 14, 2016, <http://lwcc-dbu-quangtri.vn/en-us/FACTS-AND-FIGURES/By-Province/Quang-Tri-Province>, p. 1.

³⁵ "Explosive Remnants of War Accidents and Casualties in Quang Tri from 2000-2016," Project RENEW website, accessed July 20, 2016, <http://www.landmines.org.vn>.

challenges the continuing impact of UXO on Vietnamese families and children was hardly on the radar in the United States. Moreover, attitudes in the U.S. remained quite antagonistic to all things Vietnamese, as did the stance of the American government.

For nearly two decades after the departure from Vietnam, U.S. policymakers remained silent about the magnitude of harmful weapons they had left behind. Officials did not acknowledge the gravity of the problem or the fact that American weapons were continuing to maim and kill innocent civilians, nor did they evince responsibility for intervention and offer assistance to stop what amounted to a continuing war long after formal hostilities had ended.³⁶

It was not until the mid-1990s that the legacy of the Vietnam War and the ongoing harm to Vietnamese people would be publicly addressed, albeit in quite small and largely halting ways. Even then, initial steps were taken not by the U.S. government but by private organizations, often headed by GIs who had fought in the War. A first step was taken by Peace Trees, a non-governmental organization that came to plant trees in the country with the intention of repairing and strengthening relations between Vietnam and the United States. Over time, the presence of Peace Trees helped to expose the existence of UXO and the enormity of the problem, with the organization determining that its work should include the removal of unexploded ordnance, which interfered with the safe planting of trees. The presence of Peace Trees in Vietnam would bring about a change in the discourse and treatment of the legacy of the War, establishing the imperative not only to acknowledge the existence of all the left-behind killing devices, but also calling for their removal. With growing knowledge of the UXO threat, as well as the magnitude of the problem, impetus developed to pressure the U.S. government into

³⁶ Searcy, 2016.

removing ordnance from several acres of land, an act which signified the first U.S. acknowledgment of the problem it had created and then ignored for decades.³⁷

This pivotal period ultimately served as a catalyst to generate international interest and mobilization regarding the issue of UXO and possible solutions. International attention in turn began to pressure the United States to give even more consideration to the impact of its remaining war weapons, and also to start acknowledging the enormity of the “continuing war” that remained beneath the waters and soil of Vietnam.

From that point forward, at least some responsibility regarding UXO cleanup in Vietnam was a principle that remained on the American national policy table. The connection between U.S. ordnance and ongoing Vietnamese injuries and deaths had been established and U.S. culpability affixed, at least sufficiently so to break through the political and policy resistance of prior decades.³⁸

The previously unthinkable was to take place as the U.S. State Department would begin to support at least some UXO clearance efforts.³⁹ The beginning of direct U.S. involvement began with the State Department’s Humanitarian Office, with over \$200,000 given towards the launch of a UXO risk-safety program in conjunction with Peace Trees.⁴⁰ The State Department later donated \$3.3 million to Project RENEW through Norwegian People’s Aid and, more recently, allocated more than \$50 million toward expanding UXO cleanup in and around Quang Tri province.⁴¹

³⁷ Searcy, 2016.

³⁸ Searcy, 2016.

³⁹ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

⁴⁰ Searcy, 2016.

⁴¹ Searcy, 2016; Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

According to U.S. veteran Chuck Searcy, now a resident of Vietnam and a major player in bringing matters to the attention of U.S. officials, “This was the start of an approach to an end-game, that is to say real closure and with an effort to assist Vietnam to develop the capacity to manage [the UXO] problem for future years. Within the next decade, the U.S. should be able to step back and say ‘we finally assisted the Vietnamese and began to do what we should have done 40 years ago’.”⁴²

Yet despite such optimism, U.S. contributions remain exceptionally modest when compared to the need in Vietnam and to the capacity of the U.S. to engage in more serious cleanup and remediation. In 2012, for example, the Vietnamese Deputy Prime Minister, Nguyen Thien Nhan, predicted that UXO clearance in Vietnam would require \$10 billion and another hundred years to accomplish at the current rate of progress. Others have estimated triple that amount of time for complete removal.⁴³ In order to make a substantial impact, the U.S. State Department would in all likelihood need to make far more substantial contributions.

Future progress may depend on Senator Patrick Leahy of Vermont, who has been effective in encouraging Congress to allocate money to the State Department in support of UXO clearance. In addition to Senator Leahy, Senators McCain, Webb, Harkin, and former-Senator John Kerry have also demonstrated support to varying degrees, although Leahy has by far been the most instrumental.⁴⁴

In addition to allocated State Department funds for UXO clearance, the U.S. has also contributed to clearance in a handful of other ways such as capacity-building with the Vietnamese Ministry of Defense. The State Department also funds Golden West Humanitarian

⁴² Searcy, 2016.

⁴³ Olson, “A New Approach”, p. 4.

⁴⁴ Searcy, 2016.

Foundation programs in mine-impacted countries, and contributes to general development work throughout Vietnam.⁴⁵

Meanwhile, the years of silence on the part of the United States had left the Vietnamese government little choice but to take whatever remediation action it could afford. Searcy notes that the Vietnamese government “put a lot of money into their own budget [for clearance], but we don’t know much about what they do.”⁴⁶ In Quang Tri, for example, an initial response and rehabilitation system is now in place for victims of UXO, although the situation in other provinces remains somewhat less clear.

Above all, Project RENEW has played the key role in UXO clearance in the countryside. Committed to “restoring the environment and neutralizing the effects of war”, Project RENEW is located in Quang Tri province and operates three programs: the physical removal of UXO; community education regarding the identification and dangers of unexploded ordnance; and a victim assistance program providing prostheses and rehabilitation for victims of UXO explosions. The majority of RENEW’s revenue comes from a mix of U.S. and other international donors such as Norwegian’s People’s Aid (their primary partner), and the Vietnamese through the Department of Science and Technology; Department of Health; Department of Foreign Affairs; Provincial Military Headquarters; and Office of Province People’s Committee.

Project RENEW’s removal team follows the procedures of international humanitarian groups to help ensure safety, and within the last nine years has removed 30,538 UXO from gardens, rice fields, plantations, and roadsides in Quang Tri.⁴⁷ Within the past year alone, RENEW received more than 600 calls from local families reporting discoveries of ordnance.⁴⁸

⁴⁵ Searcy, 2016.

⁴⁶ Searcy, 2016.

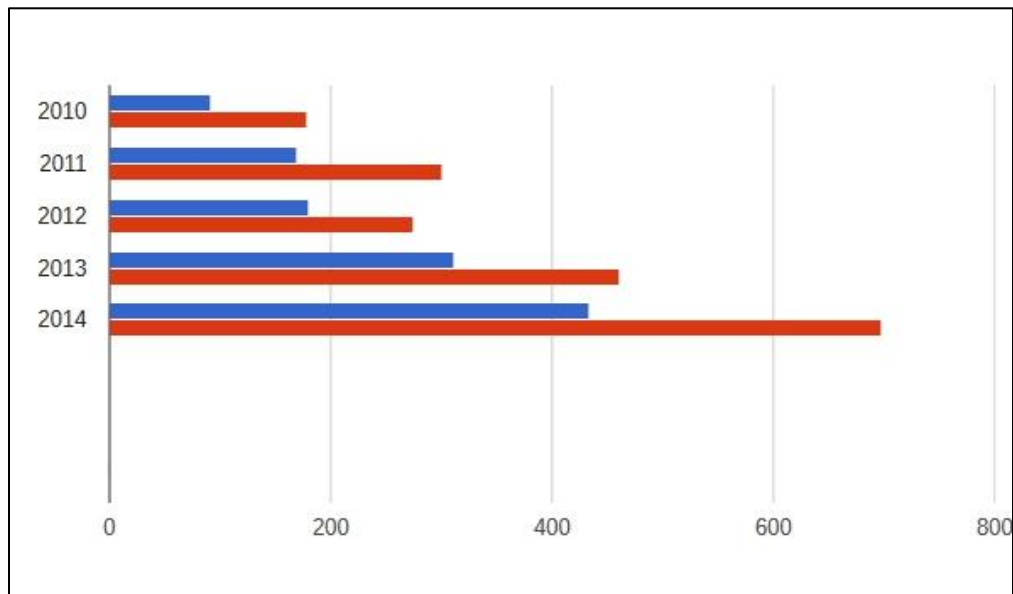
⁴⁷ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

⁴⁸ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

As shown in the following graph, there was a measurable increase over recent years in the number of UXO discovered and reported by local people to Project RENEW's teams for timely and safe removal.

UXO Activity in Vietnam Over a Five Year Period

Red = UXOs discovered Blue = UXOs destroyed



Source: Project RENEW

Project RENEW's victim assistance staff works closely with hospital and health care providers regarding incidence and outcomes of victims of UXO explosions. All amputees fitted for prostheses also receive training by health care professionals about the use and care of artificial limbs, as well as regular checkups and counseling regarding the need for replacement of the prostheses. RENEW is one of the key organizations in Vietnam committed to UXO clearance and victim assistance and, since 2008, its staff have fit 1,100 people with prostheses, with nearly

that many more remaining on the wait list.⁴⁹

* * *

For a wealthy superpower, as well as the major protagonist leaving behind weapons of destruction that harm Vietnamese civilians to this day, the U.S. government arguably has done little regarding the ongoing damage inflicted by its unexploded ordnance. Children are still being maimed by cluster bombs, their parents are still dying from grenades and mines, and full removal of remaining live ordnance from Vietnam, at the rate of success over the past two decades, reportedly will take hundreds more years.

But explosive ordnance are not the only threat the U.S. left behind. Significant issues remain today regarding ground and water contamination in Vietnam, the result of widespread chemical defoliation by the U.S. Air Force during the War, a topic to which we now turn.

⁴⁹ Ngo Xuan Hien and Nguyen Thanh Phu, 2016.

3. HERBICIDE COCKTAILS, CANCERS, AND BIRTH DEFECTS

From 1962 until 1972, the U.S. Air Force planes sprayed millions of gallons of herbicides throughout Vietnam¹ with the dual purpose of “destroying crops that might feed the Viet Cong, and removing forest cover to make their presence more visible to spotter planes and airstrikes.”² Of the total gallons sprayed, nearly two-thirds were Agent Orange³, named for the color bands of its storage barrels.⁴ While estimates of herbicide use vary, scientists at Columbia University, led by Dr. Jeanne Steelman, placed the actual volume sprayed at more than 20 million gallons.⁵

The spraying targeted three primary areas of Vietnam: southern regions near the Bien Hoa and Phu Cat air bases; central provinces near the Da Nang air base; and along the Ho Chi Minh Trail, an area used by the Viet Cong to transport troops and supplies to the South. The defoliants blanketed a substantial portion of the land in southern Vietnam, and as much as 34% of the targeted areas were sprayed more than once, some of them many times.⁶

The Air Force conducted the spraying in so-called “missions” under the code name Operation Ranch Hand, carrying out a total of 20,000 missions often timed with the harvest cycle.⁷ While Agent Orange was sprayed in about two-thirds of the Ranch Hand missions, it was only one of a rainbow spectrum of poisonous herbicides used. Agent White was the second most-used defoliant, followed by Agent Blue which was used primarily for vegetation destruction (as opposed to trees). In smaller quantities Agents Pink, Green, and Purple were also used,

¹ Schechter, “Recent Dioxin Contamination from Agent,” p. 435- 443; Jeanne Stellman, “The Extent and Patterns of Usage of Agent Orange and Other Herbicides in Vietnam,” *Nature* 422 (2003), p. 681.

² George Black, “The Lethal Legacy of the Vietnam War,” *The Nation*, March 16, 2015, p. 22-23.

³ “Spillover,” Agent Orange Record, accessed June 22, 2016, http://www.agentorangerecord.com/impact_on_vietnam/environment/hot_spots, p. 1.

⁴ Stellman, “The Extent and Patterns,” p. 681; Black, “The Lethal Legacy,” p. 23.

⁵ Stellman, “The Extent and Patterns,” p. 682.

⁶ “The Invisible Enemy,” *Agent Orange Record*, accessed July 1, 2016, http://www.agentorangerecord.com/agent_orange_history/in_vietnam, p.1.

⁷ Stellman (quoted in George Black, “The Lethal Legacy,” p. 22.

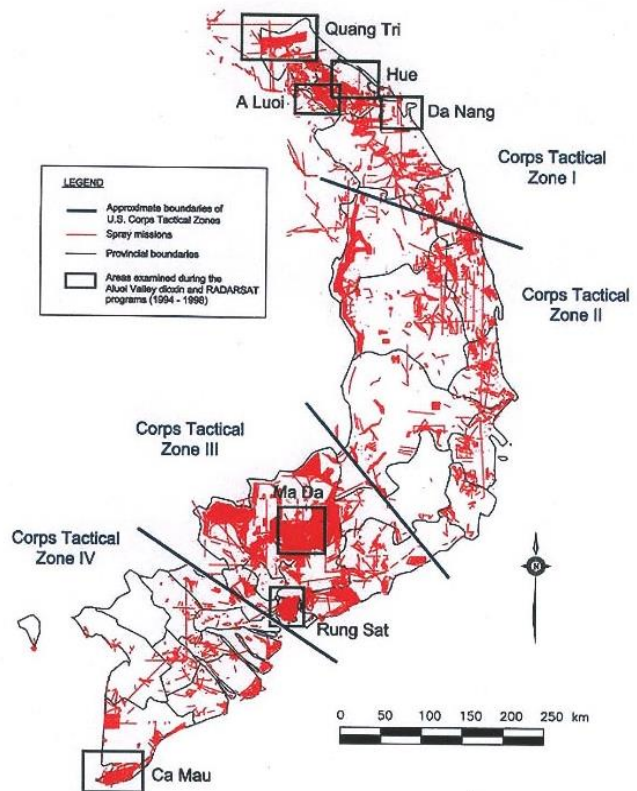
particularly during the early years of the War.⁸ Collectively, these defoliants were sprayed in quantities up to 50 times the concentrations recommended by their manufacturers.⁹

The spraying missions were ubiquitous, often executed at frequencies within days of each other, exposing Vietnamese soldiers and civilians alike to the toxic chemicals. Over the decade 3,181 villages were sprayed with the defoliants,¹⁰ exposing some 4.8 million men, women, and children to their harmful effects.¹¹

Stellman's research team found that one million Viet Cong soldiers were exposed,¹² in addition to many more Vietnamese civilians. Moreover, an estimated 2.8 million American troops on the ground were exposed to the chemicals as well, an outcome whose import

and far-reaching consequences would not begin to be understood until decades after the War

Locations of Herbicides Sprayed in Vietnam



⁸ Stellman, "The Extent and Patterns," p. 681.; Hatfield Consultants, Ltd, "Preliminary Assessment of Environmental Impacts Related to Spraying of Agent Orange Herbicide During the Viet Nam War," 1998, accessed July 11, 2016, <http://www.hatfieldgroup.com/wp-content/uploads/AgentOrangeReports/CIDA614/default.htm>, p. 36-38; John Stapleton, *Agent Orange: The Cleanup Begins*, (Sydney: A Sense of Place Publishing, Inc, 2013), p.6-7.

⁹ "Promoting Hope and Dignity: A Long-Term Humanitarian Response to Agent Orange and Dioxin in Vietnam," *The Aspen Institute*, accessed July 11, 2016, <https://www.aspeninstitute.org/programs/agent-orange-in-vietnam-program/promoting-hope-dignity-long-term-humanitarian-response-agent-orange-dioxin-vietnam>, p. 2; Stapleton, *Agent Orange: The Cleanup Begins*, p. 7.

¹⁰ "What is Agent Orange?" *The Aspen Institute*, accessed July 7, 2016, <https://www.aspeninstitute.org/programs/agent-orange-in-vietnam-program/what-is-agent-orange>, p.4; The War Remnants Museum, Ho Chi Minh City, Vietnam, 2016.

¹¹ "Agent Orange," *The American Public Health Association*, accessed July 7, 2016, <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/29/13/22/agent-orange>, p. 1; Program staff (Vietnamese Association for Victims of Agent Orange) in discussion with the author, July 2016.

¹² "Eating, Drinking, Touching, Breathing, Nursing, Conceiving," *The Agent Orange Record*, accessed June 10, 2016, http://www.agentorangerecord.com/impact_on_vietnam/health, p. 4.

would end.

Spraying of Agent Orange, Operation Ranch Hand Mission



Source: Chau, *Beyond the Lines*

The spraying missions cast a wide shadow of destruction. But unlike the deployment of ordnance whose threats are announced by loud explosions, the approaching peril of defoliants is more silent, their unseen toxins penetrating the environment and food chain for years.¹³

The most pernicious of the silent killers was dioxin, also known by the chemical name TCDD (tetrachlorodibenzo-p-dioxin). TCDD is a derivative compound of Agent Orange, classified as one of the most toxic substances known to science.¹⁴ Dioxin is part of a family of seventy-five chemicals, of which TCDD is the most toxic,¹⁵ and is produced as a by-product

¹³ “Dioxins and Their Effects on Human Health,” *World Health Organization*, accessed July 8, 2016, <http://www.who.int/mediacentre/factsheets/fs225/en>, Section: “Key Facts.”

¹⁴ Doug Hostetter, “A Pacifist in the War Zone.” In *The People Make the Peace: Lessons from the Vietnam Antiwar Movement*, edited by Karín Aguilar-San Juan and Frank Joyce (Charlottesville, Just World Books: 2015); Johansson and Le, “Impact of Chemical Warfare,” p. 156.

¹⁵ Schechter, “Recent Dioxin Contamination,” p. 435; “Dioxins and Their Effects on Human Health,” *World Health Organization*, Section: “Background;” “Dioxins,” *The National Institute of Environmental Health Science*, accessed July 14, 2016, <https://www.niehs.nih.gov/health/topics/agents/dioxins>, p. 1.

during combustion or during the manufacture of chlorinated chemicals.¹⁶ According to the World Health Organization, the standard safe limit of dioxin in the blood is .07 parts per trillion (ppt), and the environmental limit in many countries typically is 1,000 ppt in soil and 100 ppt in sediment.¹⁷ As we will see, these standards were to be ignored many times over by the U.S. military.

The ubiquitous use of this toxic agent in Vietnam was compounded by its persistent shelf-life. Dioxin is slow to degrade in the environment, and in surface soil it can take decades to break down to its half-life (half the original concentration). “Sun will break down dioxin, so on leaf and soil surfaces it will last one to three years, depending on conditions, [whereas] dioxin buried or leached under the surface or deep in the sediment of rivers and other bodies of water can have a half-life of more than 100 years.”¹⁸

¹⁶ “All You Ever Wanted to Know About Dioxin or Perhaps You Really Do Not Want to Know,” *Agent Orange Association of Canada*, accessed July 19, 2016, <http://www.agentorangecanada.com/dioxin.php>, p. 1.

¹⁷ “Health Effects,” *The Aspen Institute*, accessed June 10, 2016, <https://www.aspeninstitute.org/programs/agent-orange-in-vietnam-program/health-effects>, p. 4; Charles Bailey and Susan Hammond, “Frequently Asked Questions About Agent Orange/Dioxin,” *War Legacies Project and Ford Foundation*, accessed, June 9, 2016, <http://www.agentorangerecord.com/images/uploads/modules/AODFAQ.pdf>, p. 4.

¹⁸ “What is Agent Orange?” *The Aspen Institute*, p. 4.

Conversion of Standard to Metric Measurements

Standard	Metric
1 gallon	3.79 liters
1 quart	0.95 liters
1 pint	0.47 liters
1 pound (lb.)	0.45 kilograms
1 ounce (oz.)	28.35 grams
1 ounce (oz.)	28,349.5 milligrams (one-thousandth of a gram)
1 ounce (oz.)	28,349,500 micrograms (one-millionth of a gram)
0.26 gallons	1 liter
1.056 quarts	1 liter
2.11 pints	1 liter
2.2 pounds (lb.)	1 kilogram
35.274 ounces (oz.)	1 kilogram
0.035 ounces (oz.)	1 gram
0.00003527396 ounces (oz.)	1 milligram (one-thousandth of a gram)
3.5274e-8	1 microgram (one-millionth of a gram)

PPT (Parts per Trillion)	PPT analogies
1 nanogram/kilogram (ng/kg) = 1 ppt	1 square inch in 250 square miles
1 nanogram/liter (ng/l) = 1 ppt	1 second in nearly 32,000 years
1 picogram/gram (pg/g) = 1 ppt	1 ounce in 7.5 billion gallons of water

Even in rivers and lakes dioxin is persistent. It accumulates in sediment and, because it is hydrophobic (water-repellent), it typically is absorbed by organisms where it works its way up the food chain to fish and eventually to humans.¹⁹ Moreover, just as “dioxin dissolves poorly in water, it does not dissolve well in the blood, and stays there for only a short time...accumulating in fatty tissues...” of animals and humans.²⁰ As such, “more than 90% of [dioxin] exposure comes from...fish, meat, and poultry...”²¹ sometimes in concentrations nearly 100,000 times higher than that of dioxin found in the environment.²²

So potent is dioxin that it continues to pose both environmental and human health risks decades after its use in Vietnam. An estimated two liters of its residue, for example, remain in the customary 208-liter storage barrels after they have been emptied, and even when rinsed up to three times, about 20% of the residue still remains.²³ Even so-called “low residue” barrels of dioxin contain 1.25 mg, an astronomical amount when considering that as little as 85g could wipe out an entire city of eight million people (if evenly consumed by all).²⁴ Barrel residue alone has led to “inadvertent defoliation of trees and gardens in Da Nang, Nha Trang, Bien Hoa, Phu Cat, and Saigon civilian areas near U.S. Air Force bases that handled the herbicides when the so-called empty barrels were transported to local merchants for commercial uses.”²⁵

Even the process of pumping herbicides into barrels and loading them onto aircraft for spraying sprees was risky due to vapors and spillage. The National Institutes of Health has noted,

¹⁹ Tran Thi Tuyet-Hanh et al, “Environmental Health Risk Assessment of Dioxin Exposure Through Foods in a Dioxin Hot Spot—Bien Hoa City, Vietnam,” *International Journal of Environmental Research and Public Health*, 7 no. 5 (2010), p. 2397.

²⁰ Tran, “Environmental Health Risk Assessment,” p. 2398.

²¹ “All You Ever Wanted to Know About Dioxin,” *Agent Orange Association of Canada*, p. 2.

²² Tran, “Environmental Health Risk Assessment,” p. 2397.

²³ Stellman, “The Extent and Patterns,” p. 685.

²⁴ Laws, Edward A, *Aquatic Pollution: An Introductory Text 3rd edition* (Los Angeles: John Wiley & Sons, 2000), 354; The War Remnants Museum, Ho Chi Minh City, Vietnam, 2016.

²⁵ Stellman, “The Extent and Patterns,” p. 685.

for example, that at least four major spills occurred within a three-month period from December, 1969 to March, 1970, consequently releasing a substantial amount of dioxin into nearby land and causing “considerable soil, water, mud, and food contamination...at the air base and its vicinities.”²⁶

Dioxin contamination in the environment frequently becomes a pernicious and virtually ongoing process. Dioxin can exist in the soil or be released from burned waste products to bind with particles in the atmosphere to shield it from photo-degradation by sun rays. The dioxin in turn “stays suspended for a long period of time before settling”, often into nearby land and surface-soil.²⁷ As such, the defoliant toxins affected the areas sprayed by the Air Force, and they also expanded into and contaminated broader regions of the land.

Dr. Wayne Dwernychuk of Hatfield Consultants, a Canadian environmental firm whose work in Vietnam was funded by the Ford Foundation, notes that “the loss of a significant proportion of southern Vietnam’s forest cover triggered a number of related effects...the loss of timber led to reduced sustainability of ecosystems, decreases in the biodiversity of plants and animals, poorer soil quality, increased water contamination, heavier flooding and erosion, increased leaching of nutrients and reductions in their availability, invasions of less desirable plant species...and possible alterations of both macro- and microclimates.”²⁸ So much of the vegetation in Vietnam had been destroyed that natural regrowth was not viable. In the deforested areas even new seedlings had been annihilated and soil nutrients destroyed which, in turn, intensified erosion in the mountains and river beds.²⁹

²⁶ Tran, “Environmental Health Risk Assessment,” p. 2396.

²⁷ Tran, “Environmental Health Risk Assessment,” p. 2397.

²⁸ “The Chemical Scythe,” *Agent Orange Record*, accessed July 15, 2016, http://www.agentorangerecord.com/impact_on_vietnam/environment/defoliation, p. 1.

²⁹ “The Chemical Scythe,” *Agent Orange Record*, p. 2.

Before Spraying



After Spraying



Source: Agent Orange Record

Even today the contaminated land continues to harbor low levels of residual dioxin in soil, sediment, food and wildlife³⁰ with amounts ranging from 185,000 ppt (parts per trillion) and 236,000 ppt at the respective Bien Hoa and Phu Cat air bases, and as high as 365,000 ppt at the Da Nang air base.³¹ As mentioned earlier, the standard international limit set by most countries cannot exceed “1,000 ppt in soil and 100 ppt in sediments” without requiring “immediate remediation.”³² In the case of the Vietnam War, immediate remediation was not an option due to the ongoing hostilities, and it was then rendered impossible altogether by the abrupt evacuation of the U.S. military, which left behind numerous dioxin-contaminated areas and storage supplies when it precipitously fled the country.

This historical record establishes that from the mid-1960s until the early 1970s, Vietnam effectively became a laboratory for a massive experiment on human life. Both Vietnamese and

³⁰ Schechter, “Recent Dioxin Contamination,” p. 442.

³¹ Bailey and Hammond, “Frequently Asked Questions,” p. 4.

³² Bailey and Hammond, “Frequently Asked Questions,” p. 4.

American combatants, as well as millions of civilians, were saturated with one of the most toxic chemicals known to humankind, leaving the impact to be revealed decades later.

Even at the time of their use in Vietnam, the toxicity of Agent Orange and other herbicides were quite well-known to the manufacturers. Agent Blue, for example, had been determined to be “an arsenical [arsenic compound] that has promoted a variety of cancers in rats; Agent White was a mixture of 2, 4-D and Picloram, a proprietary product of Dow Chemical that contained a chemical compound known as hexachlorobenzene, a probable human carcinogen; and Agent Purple was known to have even higher levels of TCDD (dioxin) than Agent Orange.”³³

Statements made in later class-action lawsuits, including the testimony of chemical company officials themselves, reveal that manufacturers were aware of serious adverse health consequences associated with dioxin as early as the 1950s, long before the start of the Vietnam War. During a subsequent lawsuit by Monsanto workers, for example, the company’s medical director, Dr. R. Emmet Kelly, acknowledged that dioxin “is the most toxic compound ever experienced. It presumably is toxic by skin contact as well as by inhalation...even trace amounts of this (200 ppb) have caused chloracne [skin lesions]...”³⁴

It would be decades, however, before independent scientific studies would document the potency of this lethal chemical agent. Researchers would find that dioxin binds strongly with intracellular receptors in the human body, easily accessing the nuclei of cells where DNA is

³³ Black, “The Lethal Legacy,” p. 24-25.

³⁴ Martha Hamilton, “First of Monsanto Workers' Agent Orange Trials Is Set,” *The Washington Post*, accessed July 15, 2016, https://www.washingtonpost.com/archive/business/1984/06/10/first-of-monsanto-workers-agent-orange-trials-is-set/52f2d640-d050-4325-a939-2043a937830f/?utm_term=.b26b837418dc, p. 3.

located. This, in turn, can alter DNA instructions that produce enzymes, hormones and proteins and as a result, can cause severe fetal deformities and chronic diseases.³⁵

A 2009 study by the U.S. Institute of Medicine found “evidence of association between exposure to dioxin and five illnesses: soft tissue sarcoma, non-Hodgkin’s lymphoma, chronic leukemia, Hodgkin’s disease, and chloracne...[as well as] evidence suggesting an association with prostate cancer, multiple myeloma, amyloidosis, Parkinson’s disease, heart disease, hypertension, type 2 diabetes, cancer of the larynx and lung, and spina bifida.”³⁶ Professor Arnold Schecter of the University of Texas/Dallas notes that “although the health or epidemiology research from Vietnam on cancer and birth defects is not considered conclusive by Western scientists, it has been shown from other studies that dioxins are toxic and can cause...cancer, immune deficiency, nervous system damage including lower IQ and emotional problems, endocrine disruption including diabetes, thyroid problems, sex hormone disorders, liver damage, reproductive and developmental pathologies, and death from heart attacks in highly exposed workers.”³⁷

Alongside these documented defects and diseases, other research has pinpointed an association between dioxin and birth defects in the children of those exposed during the War. Research sponsored by the U.S. National Institute of Environmental Health Sciences (NIEHS) concluded that dioxin exposure in Vietnam was responsible for more than 500,000 birth defects in the children of exposed adults.³⁸ Led by Professor Michael Skinner of Washington State

³⁵ “All You Ever Wanted to Know About Dioxin,” *Agent Orange Association of Canada*, p. 4-5; Brant Hamel, “Dioxin Exposure Causes Transgenerational Health Effects,” *National Institute of Environmental Health Sciences* 120, no. 11 (2012), p. 1.

³⁶ “Health Effects,” *The Aspen Institute*, p. 1.

³⁷ Arnold, Schecter, “Statement to the House Subcommittee on Asia, the Pacific and the Global Environment on the impact of Agent Orange.” Vietnam Agent Orange Relief and Responsibility Campaign, Washington, DC, May 2008, p. 1.

³⁸ Hamel, “Dioxin Exposure,” p. 1-2.

University, the NIEHS research team concluded that dioxin exposure imprints changes in the patterns of sperm across generations of descendants, such that were dioxin somehow completely removed from the environment today, its impact would continue to cause disease and birth defects for generations to come.³⁹

Considering the long-term effects of herbicide exposure on humans, it does not altogether come as a surprise that the rate of birth defects in Vietnam “quadrupled since the War, and that most of them occur where Agent Orange was sprayed or stored.”⁴⁰ Researchers at the Hue Medical School in Vietnam found “strikingly high numbers of certain disabilities among children in Cam Lo [near one of the U.S. military bases], many of which appear on the U.S. Veterans Administration list of congenital disorders in the offspring of female veterans.”⁴¹ Similarly, a joint study by Vietnamese and Japanese scientists found a high rate of reproductive failure in women in two sprayed communities in Cam Lo, as well as highly elevated levels of dioxin in breast milk.⁴² Moreover, Arnold Schecter’s team found elevated levels of dioxin in milk samples, as well as in seafood from southern Vietnam where Agent Orange spraying was widespread,⁴³ and Dr. Jean Grassman of Brooklyn College in New York has noted that “women pass their exposure to their children both in utero and through the excretion of dioxin in breast milk.”⁴⁴

Transgenerational effects occur, however, as a long-term consequence of dioxin exposure, with much of its impact revealed almost immediately. As estimated 400,000 Vietnamese, for example, died as a result of direct exposure.⁴⁵ The Vietnamese Red Cross

³⁹ Hamel, “Dioxin Exposure,” p. 2.

⁴⁰ MacPherson, p. *The People Make the Peace*

⁴¹ Black, “The Lethal Legacy,” p. 30.

⁴² Dang Duc Nhu et al, “A GIS Study of Dioxin Contamination in a Vietnamese Region Sprayed with Herbicide,” *Environmental Health and Preventive Medicine* 14, no. 6 (2009), p. 356.

⁴³ Schecter, “Recent Dioxin Contamination,” p. 435.

⁴⁴ Marjorie Cohn, “Agent Orange: Terrible Legacy of the Vietnam War,” Thomas Jefferson School of Law, *The Huffington Post*, May 1, 2016, p. 2.

⁴⁵ Hamel, “Dioxin Exposure,” p. 1.

estimates that “up to three million Vietnamese have suffered health effects from dioxin exposure, of whom at least 150,000 are children...”⁴⁶ As for U.S. troop exposure, the Veterans Administration presumes that “any of the 2.8 million U.S. veterans who had ‘boots on the ground’ in Vietnam were exposed to dioxin-contaminated herbicides, including Agent Orange.”⁴⁷

While evidence continues to mount, researchers now consider the variety of chemical defoliants used during the Vietnam War to pose wholly unacceptable risks to human health, both then and today. But this knowledge and the consensus regarding their lethal effects was not reached quickly, particularly because of debate over the association between Agent Orange exposure and adverse health outcomes, and even more so because of lack of actual proof regarding causality. Researchers know that victims of dioxin exposure, as a group, experience higher rates of birth deformities, for example, but they cannot prove that any one individual case is due to dioxin exposure as opposed to something else.

With no way for researchers to prove individual or direct causation or what scientists call a “dose-response” relationship between dioxin exposure and health outcomes, U.S. policymakers simply denied that Agent Orange was the cause of the high number of diseases, deformities and health complications, whether they occurred among Vietnamese civilians or returning American soldiers. It would take years before sufficient evidence mounted to establish the link between Agent Orange exposure and adverse health outcomes. Even when U.S. officials did finally acknowledge the impact of exposure on its own troops who had served in Vietnam, they continued (and still continue) to ignore the impact that dioxin exposure had (and continues to

⁴⁶ “Health Effects,” *The Aspen Institute*, p. 3.

⁴⁷ “Health Effects,” *The Aspen Institute*, p. 2.

have) on the families and children of Vietnam.

Birth Deformities Believed to be Related to Agent Orange Exposure (War Remnants Museum, Saigon)



The dissonance between what science knew and what U.S. policymakers would accept was not unlike today's politically-motivated denial of global warming. Even as scholarly evidence began to mount neither "the U.S. nor the chemical companies involved admitted that

deformities and health issues were caused by the spraying of Agent Orange.”⁴⁸ The extent of U.S. denial about possible linkages was reflected in the blind claim of Pete Peterson, former U.S. Ambassador to Vietnam and a former Air Force pilot: “Any talk of Agent Orange is propaganda designed to extort war reparations.”⁴⁹

Despite official denials, sufficient knowledge existed regarding toxic agents to realize that humans should not be exposed to them. As early as April, 1970, the U.S. ordered a domestic ban on trichlorophenoxyacetic acid “on the basis of its teratogenicity”, including evidence of congenital malformations.⁵⁰ But the ban did not extend to use outside the U.S. as the war effort stood paramount in the thinking of those in charge. Admiral Elmo Zumwalt later noted that “because the material was to be used on the enemy, none of us were overly concerned.”⁵¹

It was not until U.S. troops began to return from Vietnam, many with a variety of serious but unexplained health problems, that attention would turn to the possibility of a link to war-related chemical exposures. However the U.S. government, primarily through the Department of Defense and the Department of Veteran Affairs, was having nothing to do with what they claimed to be unsubstantiated conjecture. The policy of the federal government was that there was no evidence to link Agent Orange to the health status of its returning veterans. This position, however, would change as additional evidence mounted.

In the early 1970s, Congress ordered a joint study by the Department of Defense and the National Academy of Sciences to assess the environmental and physiological effects of defoliation in Vietnam. Referred to as NAS-1974, the study relied heavily on what were known as the HERBS files (based on the term *herbicides*), an Air Force database of flight path

⁴⁸ *Chau, Beyond the Lines*, directed by Courtney Marsh (2015; Los Angeles, CA: Seventh Art Releasing).

⁴⁹ Black, “The Lethal Legacy,” p. 14.

⁵⁰ Stellman. “The Extent and Patterns,” p. 683.

⁵¹ Black, “The Lethal Legacy,” p. 25.

coordinates used for Agent Orange spraying missions conducted between 1965 and 1971. The HERBS files contained flight logs of nearly 10,000 U.S. flight missions during the War, detailed written records of troop and civilian locations, and information about land and soil composition.⁵² Yet as useful as the HERBS files were in providing detailed information about the location and targets of the missions, slight but noticeable inaccuracies in pilot records, transcription, and other data led to questions about their accuracy.⁵³

This was to change, however, through the research of Professor Jeanne Stellman of Columbia University's Mailman School of Public Health, whose team performed a rigorous and comprehensive review of archival data from the U.S. military. While working in collaboration with the U.S. Armed Services Center for Research of Unit Records, Stellman's team re-examined the HERBS files and, in the process, discovered additional archives that previously had been overlooked. The new information included the location and movement of American troops in relation to individual Agent Orange flight paths, which enabled the team to calculate overlays of precise flight patterns with actual U.S. troop presence in the vicinity of specific spraying missions.

The team thus "transform[ed] the HERBS files from a chronological listing of criss-crossing flight paths into target-related patterns of flights at different points in time,⁵⁴ the precise ingredients needed to assess exposure risks of U.S. troops. Moreover, in revising their data, the team found that the amount of dioxin sprayed within the decade in question was nearly double that estimated in the original NAS-1974 study.

⁵² Stellman, "The Extent and Patterns," p. 686.

⁵³ Stellman, "The Extent and Patterns," p. 685.

⁵⁴ Stellman, "The Extent and Patterns," p. 682.

The value of Stellman's research lay not simply in assessing the use of Agent Orange, but in identifying the exposure risk of combatants by plotting data onto geographic coordinates, thus revealing the location and movement of troops in relation to each separate spraying mission. The new maps indicated, for example, "whether individual soldiers or populations were likely to [have been] present in a particular zone on the day of the spraying and exposed directly, or whether they arrived later and were exposed indirectly."⁵⁵ This evidence eventually made it possible to establish an association between elevated levels of health adversities among military troops (and even Vietnamese civilian populations) who were situated along or near the documented spraying paths.

As with the number of U.S. veterans exposed to Agent Orange, the number of Vietnamese civilians exposed would prove to be significant. A Hamlet Evaluation System (HES) was established in the 1960s by U.S. advisors and South Vietnamese counterparts to compare census data and population estimates with civilian villagers residing in direct spray paths. The information from these studies was made available to Stellman's team as well. Whatever adverse health outcomes U.S. troops on the ground would have experienced from direct exposure to Agent Orange, these civilians would likely have experienced as well, and perhaps even more so since, unlike soldiers, civilian positions along the flight paths were largely fixed.

Stellman's research provided scientific validity to the health concerns of U.S. veterans by establishing links between exposure to dioxin and adverse health outcomes. This information, detailed by Stellman in widely-covered Congressional testimony, served as an impetus to finally demand U.S. government acknowledgment of the problem. Government denial and inaction was no longer politically feasible, particularly given rigorous reactions to the evidence on the part of

⁵⁵ Declan Butler, "Flight Records Reveal Full Extent of Agent Orange Contamination in Vietnam," *Nature* 422, no. 6933 (2003), accessed June 11, 2016, <http://www.nature.com/news/2003/030417/full/news030414-10.html>, p. 2.

U.S. veteran groups.⁵⁶

The contributions by Stelman's team were to be supplemented by other research teams investigating the long-term environmental impact of herbicide spraying during the War. Hatfield Consultants, the Canadian environmental firm, conducted research to assess the defoliant's long-term environmental impact. Hatfield conducted the majority of its research in the Aluoi Valley, selected because of its proximity to the Ho Chi Minh Trail and to the demilitarized zone where Agent Orange was sprayed extensively, as well as being home to U.S. air bases.⁵⁷

Soil samples collected from the three major U.S. air bases where the herbicides had been stored revealed elevated levels of dioxin in comparison to areas of the Aluoi Valley that "received only aerial applications of Agent Orange."⁵⁸ This realization soon led to the discovery of so-called *hotspots*, defined as locations "where Agent Orange was stored, loaded onto airplanes, frequently sprayed."⁵⁹ These hotspots were contaminated land "with TCDD well above internationally acceptable levels."⁶⁰

Hatfield identified 28 hotspots altogether, the majority of which were close to the Da Nang, Bien Hoa, and Phu Cat air bases, although the magnitude of Agent Orange sprayed over the course of the decade suggests that "there are quite conceivably many more [hotspots]" which have yet to be discovered.⁶¹

⁵⁶Butler, "Flight Records," p. 2.

⁵⁷ Hatfield Consultants, "Preliminary Assessment," p. 31.

⁵⁸ Hatfield Consultants, Ltd, "Identification of New Agent Orange / Dioxin Contamination Hot Spots in Southern Viet Nam: Final Report," 2006, p. 1-2.

⁵⁹ Charles Bailey, "Agent Orange: What Efforts Are Being Made to Address the Continuing Impact of Dioxin in Vietnam?" Written testimony prepared for The House Committee on Foreign Affairs Subcommittee on Asia, the Pacific and the Global Environment, Washington, DC, June 2009, p. 18.

⁶⁰ Michael F Martin, "U.S. Agent Orange/Dioxin Assistance to Vietnam," *Congressional Research Service*, 2015, <https://fas.org/sgp/crs/row/R44268.pdf>, p. 1.

⁶¹Hatfield Consultants, "Preliminary Assessment," p. 12.

Around the same time that Hatfield conducted its research, Schecter and his team from the University of Texas School of Public Health also tested the soil content near former U.S. military bases, which resulted in similar findings. The Bien Hoa base outside of Ho Chi Minh City (formerly Saigon) revealed particularly high levels of dioxin in soil as well as in nineteen of twenty human blood samples from Bien Hoa residents.⁶² Considering that the World Health Organization's standard limit of dioxin exposure is thousands of times less than what was found, these outcomes proved quite significant. Schecter's team surmised that the elevated levels of dioxin likely resulted from the mishandling and spillage of Agent Orange at the southern Bien Hoa base in 1970.⁶³

The Hatfield research found that in more than two dozen locations in Vietnam, Agent Orange contamination remains a problem today. These research findings made it clear that dioxin storage had left environmental footprints that were identifiable, particularly in former U.S. storage facilities at U.S. military bases. The researchers thus concluded "that the pattern of dioxin contamination recorded in the Aluoi Valley serves as a model for contamination throughout southern Vietnam...and subsequent contamination through the food chain transfer of TCDD is expected to be highest in areas of former military installations where significantly higher concentrations of TCDD may be residing in soils, particularly as a result of herbicide spills."⁶⁴

After decades of inaction and even denial on the part of U.S. policymakers regarding the toxic effects of dioxin exposure on humans, it seemed that science had finally prevailed. During

⁶² Schecter, "Recent Dioxin Contamination," p. 435.

⁶³ Schecter, "Recent Dioxin Contamination," p. 435.

⁶⁴ L.W. Dwernychuk et al, "The Agent Orange Dioxin Issue in Viet Nam: A Manageable Problem," The International Symposium on Halogenated Persistent Organic Pollutants, 2006, accessed July 16, 2016, http://www.vn-agentorange.org/edmaterials/oslo_fcc-2602-378231.pdf, p. 1.

the mid-to-late 1990s discussion began to transpire regarding the ordnance and chemical weapons the U.S. had left in Vietnam. President Bill Clinton lifted the U.S. economic and diplomatic embargo against Vietnam which soon led to the restoration of diplomatic relations between the countries. Soon still other research teams began to arrive in Vietnam to study dioxin contamination, and mounting evidence continued to pressure the United States government to do more regarding cleanup in Vietnam.

Not surprisingly, U.S. veterans were the first subjects of government attention. The Agent Orange Act of 1991, for example, directed the U.S. Institute of Medicine (IOM) to assess the strength of the evidence for association between exposure to military herbicides and disease in veterans and the feasibility of conducting further epidemiological studies and also recommended that the Department of Veterans Affairs develop historical reconstruction methods for characterizing exposure to herbicides in Vietnam.⁶⁵

In addition to compensation and assistance for U.S. veterans, both the U.S. and Vietnamese governments began to explore limited funding for dioxin cleanup projects as well as possible compensation for victims of the spraying missions that occurred in prior decades. But these responses were tardy, meager, and dragged out over a number of years. In fact, it was not the U.S. government that took the lead, but the U.S.-based Ford Foundation.

In the year 2000, Ford began to fund soil testing in Vietnam to further assess the levels of dioxin contamination and to gauge the continuing degree of human exposure. Ford support also was directed at public education for Vietnamese victims of both dioxin-related birth defects as well as left-behind U.S. cluster bombs. Ford's initial efforts were augmented in 2009 by a further investment to provide health and remedial services to Vietnamese victims.

⁶⁵ Stellman, "The Extent and Patterns," p. 681.

Over a period of more than a decade the Ford Foundation contributed more than \$17 million “to test for and contain dioxin-contaminated soils, develop treatments and support centers for Vietnamese who have been exposed, restore landscapes, and educate the U.S. public and policymakers.”⁶⁶ Ford also funded both U.S. and Vietnamese organizations to deliver “enhanced services in health, education and employment to children and young adults with disabilities, particularly disabilities linked to exposure to dioxin.”⁶⁷ Perhaps more importantly, the public leadership role played by Ford would later spur the involvement of the U.S. government, particularly Congress, regarding responsibility for cleanup and remediation programs in Vietnam. Meanwhile, the American Red Cross partnered with Ford, contributing \$1.5 million to begin to assess and track dioxin hotspots in Vietnam.⁶⁸

Over time several international bodies, including NGOs and other major U.S. foundations, joined in efforts to address the critical problem of dioxin contamination. Among others, these included UNICEF, the United Nations Development Program (UNDP), the Bill and Melinda Gates Foundation and The Atlantic Philanthropies.⁶⁹

All of the private efforts notwithstanding, it would take the U.S. government several more years to consider and act in helping to remediate the dioxin exposure of millions of Vietnamese civilians. Not only was the U.S. response tardy but it also would be tepid. It was not until 2007, for example, that the appropriation of funds for Agent Orange and dioxin remediation began. Congress allocated \$3 million for “remediation of dioxin-contaminated sites in Vietnam,

⁶⁶ “Hot Spots: Cleaning Up Dioxin-Contaminated Soils,” *The Aspen Institute*, accessed July 10, 2016, <https://assets.aspeninstitute.org/content/uploads/files/content/docs/agent-orange/4AOVIIFactSheet-HotSpots-CleaningUpDioxin-ContaminatedSoils-Aug2011.pdf>, p. 2.

⁶⁷Bailey, “Agent Orange,” p. 20.

⁶⁸Bailey, “Agent Orange,” p. 20-21.

⁶⁹Bailey, “Agent Orange,” p. 21.

and to support health programs in communities near those sites.”⁷⁰ Other small allocations would follow, guided in part by a bilateral advisory committee of the Environmental Protection Agency (EPA) and a Vietnamese government counterpart, designed to “quicken the pace of action” regarding dioxin cleanup.⁷¹ The Congressional Research Service notes that “while the appropriated funds for environmental remediation generally have been allocated under the State Department’s Economic Support Fund account, while the funds for health and disability programs have been allocated under the Developmental Assistance Account, the State Department has in fact “delegated responsibility for the administration and obligation of the appropriated funds to USAID.”⁷² Of the total \$21 million appropriated funds for 2007- 2013, USAID allocated 81% for environmental remediation, and 16% for health and disability services. The remaining 3% of funds were not allocated by the end of fiscal year 2013.⁷³

The irony of U.S. funding for a hasty cleanup, after having ignored any responsibility for dioxin contamination in Vietnam for over three decades, was that its steps would be meager. In April 2011, Congress approved \$18.5 million for the fiscal year, “of which \$3 million was specifically reserved for health activities.”⁷⁴ The table below shows Congressional expenditures for Agent Orange and dioxin remediation throughout Vietnam from 2007- 2015. Total U.S. contributions for this period was \$130.3 million, an unjustifiably small amount for so large and serious a problem (see Appendix C).

⁷⁰ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 1 (See also “Ford Foundation’s Landmark Work on Agent Orange Transitions to Aspen Institute,” *The Ford Foundation*, May 5, 2011, accessed June 22, 2016, <http://www.fordfoundation.org/the-latest/news/ford-foundations-landmark-work-on-agent-orange-transitions-to-aspen-institute>; Bailey, “Agent Orange.”)

⁷¹Bailey, “Agent Orange,” p. 11.

⁷² Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 3.

⁷³ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 4.

⁷⁴ “Clean Up Efforts,” *The Aspen Institute*, August 2011, accessed July 10, 2016, <https://www.aspeninstitute.org/programs/agent-orange-in-vietnam-program/cleaning-up-contaminated-soil>, p. 4.

Table 1. Congressional Appropriations for Agent Orange/Dioxin Remediation and Health-Related Activities in Vietnam

(in Millions of U.S. Dollars)

Congress	Public Law	Date Enacted	Fiscal Year	Total Amount	Environmental Remediation	Health-Related Activities
110 th	P.L. 110-28	May 2007	2007	3.0	n.a.	n.a.
111 th	P.L. 111-8	March 2009	2009	3.0	n.a.	n.a.
	P.L. 111-117	December 2009	2010	3.0	n.a.	n.a.
	P.L. 111-212	July 2010	2010	12.0	n.a.	n.a.
112 th	P.L. 112-10	April 2011	2011	18.5	15.5	3.0
	P.L. 112-74	December 2011	2012	20.0	15.0	5.0
	P.L. 112-175 ^a	September 2012	2013			
113 th	P.L. 113-6	March 2013	2013	19.3	14.5	4.8 ^b
	P.L. 113-46 ^c	October 2013	2014			
	P.L. 113-73 ^d	January 2014	2014			
	P.L. 113-76	January 2014	2014	29.0	22.0	7.0
	P.L. 113-235	December 2014	2015	22.5	15.0	7.5
TOTAL				130.3	82.0	27.3

Source: CRS research, with the assistance of U.S. Agency for International Development (USAID).

Notes: Table does not include \$3.9 million allocated for these purposes by the State Department out of funds appropriated for more general uses, such as the Economic Support Fund (ESF). Appropriations made in the 110th and 111th Congress did not allocate amounts between environmental remediation and health-related activities.

- a. Superseded by P.L. 113-6.
- b. Amount based on sequestration rate of 3.3%; USAID reported a preliminary figure of \$3.0 million.
- c. Allowed for the continuation of funding at levels approved by P.L. 113-6 through January 15, 2014.
- d. Allowed for the continuation of funding at levels approved by P.L. 113-6 through January 18, 2014.

While arguably “too little, too late” in nature, it is questionable whether the U.S. would have provided any funding at all were it not for the insistence of Senator Patrick Leahy of Vermont. Leahy earmarked items in the federal budget to be allocated for Vietnamese people with disabilities. Wary of potential criticism that dioxin exposure cannot be determined as the cause of any particular person’s disability, Leahy’s language noted that “such assistance [be provided] regardless of cause.”⁷⁵ Over a number of years, U.S. funding, however limited, was continually provided under the watchful eye of Leahy. According to USAID, for example,

⁷⁵ Senator Leahy’s War Victim Fund (as quoted in Michael F Martin, “U.S. Agent Orange/Dioxin Assistance to Vietnam,” *Congressional Research Service*, p. 12.)

starting “with a program financed by the Leahy War Victims Fund, the U.S. government has provided over \$60 million in assistance to disabled Vietnamese, regardless of the cause of the disability.”⁷⁶

The initial work of the Ford Foundation clearly had implicated the U.S. government in the contamination of Vietnam, and in turn had led to “a cooperative cleanup of dioxin in part of the Da Nang airport, marking the first time Washington had been involved in cleaning up Agent Orange in Vietnam.”⁷⁷ Rising costs and other unanticipated delays, however, prolonged remediation efforts in Da Nang until long after the start of the project in 2009. A 2014 audit revealed that projected project costs had risen from \$33.7 million to \$88 million. Meanwhile, the Vietnamese rainy season, which prolonged the excavation of soil and construction of treatment areas, led to the shutdown of a secondary treatment facility, and the need to decontaminate more soil than originally estimated introduced additional setbacks.⁷⁸ This effort continued over several years, with restoration work at the Da Nang base finally completed in the summer of 2016. The U.S. had contributed 3% of the total project cost (see Table 1).

A second air base cleanup at Bien Hoa, one of the worst-contaminated sites due to herbicide storage during the War, is to be completed by the end of 2017. It is estimated that the amount of soil that needs to be removed at Bien Hoa, along with the Da Nang and a site at Phu Cat sites, “is enough material to cover a football field nine feet deep.”⁷⁹

Parallel to these cleanup efforts, the U.S. provided a small amount of funding for the expansion of disability services as redress for Agent Orange victims, although typically support goes not to the victims directly but through Vietnamese organizations. The various forms of

⁷⁶ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 12.

⁷⁷ Chau, *Beyond the Lines*, 2015.

⁷⁸ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 11.

⁷⁹ “Clean Up Efforts,” *The Aspen Institute*, p. 3.

support for victim families such as health and rehabilitation services usually depend on the recipient organizations. Initially, the majority of funds for health and disability services were allocated for programs specifically in Da Nang, a major Agent Orange hotspot, but subsequently expanded to cover disability services more broadly “without explicit reference to Agent Orange/dioxin hotspots.”⁸⁰

In 2012, USAID approved a three-year Persons with Disability Support Program (PDSP) headquartered in Da Nang, and to be implemented jointly by Development Alternative, Inc. (DAI) and Vietnam Assistance for the Handicapped (VNAH).⁸¹ A USAID program summary reports that after two years, “nearly \$900,000 in grants to 14 local partners and organizations” had been awarded.⁸²

Meanwhile, the Vietnamese government reportedly has been reluctant to raise concerns that the U.S. should be doing substantially more about contamination remediation and victim compensation because of concern that pressure could undermine a growing economic relationship between the two countries.⁸³ Cooperation is an issue for both Vietnam and the United States as each nation seeks to mitigate the growing role of China in the region. But this mutual concern aside, the government of Vietnam has limited resources, certainly in comparison to the U.S., to clean up environmental toxins and especially to provide victim compensation to citizens whose lives have been permanently crippled by dioxin exposure, often inter-generationally.

Vietnam’s contributions to date is an estimated \$600 million, including small monthly

⁸⁰ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 9.

⁸¹ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 12.

⁸² Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 13.

⁸³ Black, “The Lethal Legacy.”

stipends based on individual health status,⁸⁴ and on occasion support extends to the provision of medical and rehabilitation services.⁸⁵ The government also has initiated several environmental restoration efforts beginning with rebuilding mangrove forests in the Mekong Delta region and in Can Gio province near Saigon, efforts designed to mitigate the impact of erosion resulting from the removal of dioxin-contaminated soil.⁸⁶ The Vietnamese government also “conducted some mitigation measures to contain the dioxin contamination at Bien Hoa”, such as the excavation of a passive landfill in 2009 where contaminated soil was left untreated.⁸⁷ Such efforts, however, are generally limited fixes given their modest size.

The combined efforts of the U.S. and Vietnamese governments, particularly in comparison to the environmental and human health threats posed by dioxin contamination, pale in the face of overall need. In some respects, in fact, problems may be worsening. The Ford Foundation notes recent research revealing that dioxin is “moving into surrounding communities and up the food chain.”⁸⁸

Clearly the longstanding threat of dioxin exposure in Vietnam will not be meaningfully addressed, let alone ameliorated, at the current rate of intervention. And pressure almost certainly will be placed on the U.S. to do substantially more. The Aspen Institute, for example, has outlined four specific areas in which the U.S. should display greater commitment to address the dangers of widespread Agent Orange contamination in the country: 1) Publish a strategic plan to become the basis for sustained U.S.-Vietnamese cleanup and remediation work, including

⁸⁴ Program staff (Vietnam Association for Victims of Agent Orange) in discussion with the author, July 2016; Michael F. Martin, “Vietnamese Victims of Agent Orange and U.S.-Vietnam Relations,” *Congressional Research Service*, August 29, 2012, accessed July 15, 2016, <https://fas.org/sgp/crs/row/RL34761.pdf>, p. 27.

⁸⁵ Program staff (Vietnam Association for Victims of Agent Orange) in discussion with the author, July 2016.

⁸⁶ “Dealing with the Damage,” *Agent Orange Record*, 2010, accessed June 16, 2016, http://www.agentorangerecord.com/impact_on_vietnam/environment/defoliation/P1, p. 1.

⁸⁷ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 14.

⁸⁸ Charles. “Agent Orange,” p. 9.

prioritizing heavily-sprayed provinces, 2) Design and implement a health and disability program in conjunction with Vietnamese NGOs and government agencies; 3) Actively seek other bilateral donors to support long-term health and disability programs as well as development assistance efforts, and 4) Congressional review of progress and assessment of results regarding its appropriations for Agent Orange efforts in Vietnam.⁸⁹

But the key issue that has yet to surface is what the United States might owe to Vietnamese civilians whose lives and well-being have been harmed permanently by Agent Orange exposure (a potential obligation that could extend as well to those impacted by the tons of UXOs dropped by the U.S. on Vietnam). Project RENEW founder Chuck Searcy notes that inadequate attention to the plight of families presumed to be suffering from exposure to Agent Orange is the biggest weakness of U.S. aid. “The U.S. needs to do more to help but it has never developed a truly comprehensive plan to look at appropriate solutions for Vietnamese families.”⁹⁰ The Congressional Research Service suggests that Searcy’s analysis is appropriate, noting that the appropriation of funds for health and disability services for victims of Agent Orange exposure “has drawn some Congressional attention” but at a very slow pace.⁹¹

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The U.S. government has done surprisingly little to address the plight of Vietnamese families whose lives have been wantonly disrupted by America’s widespread deployment of

⁸⁹ Charles Bailey, “Agent Orange in Vietnam 2012,” *The Aspen Institute and Agent Orange in Vietnam Program*, January 28, 2013, accessed July 22, 2016, <https://assets.aspeninstitute.org/content/uploads/files/content/upload/Agent%20Orange%20in%20Vietnam%202012%20Report%20-%20EN.pdf>, p. 1.

⁹⁰ Chuck Searcy (founder of Project RENEW) in discussion with the author, July 2016.

⁹¹ Martin, “U.S. Agent Orange/Dioxin Assistance,” p. 6.

chemical defoliants and unexploded weapons of war. While it has spent some millions of dollars in support of former base cleanup, U.S. efforts have been miniscule in the context of its substantial destruction of the Vietnamese environment, and particularly the harm to human health and lives. Moreover, the United States has never formally acknowledged responsibility for poisoning the environment and villages of Vietnam, nor has it ever considered reparations to victims of Agent Orange. In short, nearly five decades after ceasing combat, the United States has never seriously confronted its responsibility under international law for the deadly destruction it visited on the country and the people of Vietnam.

We turn now to an examination of relevant legal standards regarding state accountability for redress of grievance related to the exercise and legacy of war. This assessment will include international treaties, conventions and protocols, as well as longstanding legal concepts embodied in international law that are relevant to consideration of U.S. responsibility.

4. U.S. RESPONSIBILITY UNDER TREATY LAW

The question of what, if any, responsibility the United States has with respect to cleanup of unexploded ordnance and chemical defoliants left in Vietnam, or for reparations to innocents harmed and killed has several components. The ongoing injuries and deaths of bomb victims and other harms still being suffered by civilians due to lack of post-war cleanup is a central consideration for reasons set forth in the prior chapters. But assessing the legal responsibility for cleanup and reparations is intertwined with related considerations: Which weapons the United States deployed during the War; where they were used and against which populations; and which international standards governed U.S. actions both during and after the conflict. If, for example, U.S. weapons were deployed in compliance with international standards, and if their deployment was commensurate with the established duty of states to protect civilians during war time, the only legal considerations remaining would appear to be those of responsibility for cleanup and reparations. But if international legal standards were neither observed nor met—particularly even now as U.S. weapons are still harming the people of Vietnam—then the failure to do so could be relevant to international treaty standards adopted even post-war.

We turn now to a mature body of international treaty law as the context for considering these issues. Global standards have existed for decades, some for well over a century, governing the conduct of states during war, the use of weapons, the protection of civilian populations, and responsibility for the aftermath of conflict. As with any body of law, norms change and precise conclusions about treaty provisions are not always clear. At the same time, however, such a comprehensive and longstanding legal framework established global standards for state obligations and norms of responsibility.

We now evaluate four specific treaties relevant to the consideration of U.S. responsibility mentioned above. We first examine two treaties pertaining to explosive weapons, followed by consideration of two additional treaties governing the use of chemical defoliants such as Agent Orange. In the following chapter we will then consider international obligations within the broader context of developing customary international law.

CONVENTION ON CERTAIN CONVENTIONAL WEAPONS: PROTOCOL V ON EXPLOSIVE REMNANTS OF WAR (2006)

The Convention on Certain Conventional Weapons (CCW) entered into force in 1983 and was ratified by the U.S. in 1995, with the objective of restricting and possibly banning the use of certain types of weapons of warfare “of a nature to cause superfluous injury or unnecessary suffering” to combatants or civilians. The language of the Convention itself is quite general and rather brief, but its five protocols include specific and detailed provisions (see Appendix A). Most relevant to our consideration is CCW Protocol V on Explosive Remnants of War, reportedly the first multilateral instrument to establish a clear rule that explosive munitions “must be cleared once the fighting has ended.”¹

Protocol V specifically binds States Parties to cleanup responsibilities after the cessation of hostilities. Its overall purpose is spelled out in the Introduction which recognizes that injuries to civilians typically do not cease when combatant hostilities end, and that states have legal responsibility to protect civilians by removing explosive remnants of war. Because the U.S. has failed to comply with this provision, we will examine its requirements in greater detail here to

¹ Louis Maresca, "A New Protocol on Explosive Remnants of War: The History and Negotiation of Protocol V to the 1980 Convention on Certain Conventional Weapons," *Current Issues and Comments, International Committee of the Red Cross*, 86, No. 856 (December 2004), p. 826.

ascertain its relevance. The applicability of U.S. responsibility under Protocol V rests on several arguments. Article 1(2) establishes that the Protocol applies to explosive remnants of war “on the land...including internal waters of High Contracting Parties,” which effectively covers U.S. use of ordnance anywhere in Vietnam. In short, it covers weapons the U.S. deployed (ordnance), and where they were deployed (all possible geographical locations).

Moreover, the definition of *explosive ordnance* in Article 2(1)—conventional munitions containing explosives, with the exception of mines and booby traps—encompasses the ordnance primarily deployed by the U.S. during its decade of combat. The ordnance were various explosive bombs and, more rarely, land mines and booby-traps. Furthermore, the UXO that remain in Vietnam fit the definition of *unexploded ordnance* as defined in Article 2(2), namely “explosive ordnance that has been...used in armed conflict...may have been fired, dropped, launched or projected and should have exploded but failed to do so.” Including cluster bombs but not mines and booby traps in the treaty language, however, may seem subjective if not opportunistic on the part of the drafters, and the distinction between them has given rise to critiques of the Protocol. Some legal analysts hold that despite an attempted distinction, these weapons “cannot be separated from each other on the ground”² as they all pose similarly harmful threats.

Highly notable is Article 2(5) which defines *existing explosive remnants of war* as “...ordnance that existed prior to the entry into force of Protocol V for the High Contracting Party on whose territory it exists,” (emphasis added). This clearly addresses both the time in which the U.S. deployed UXO (prior to adoption of the Protocol), as well as their location (the territory of Vietnam).

² Danielle Ressler, “A Primer on Explosive Remnants of War,” *Journal of Mine Action*, No. 10.1 (2003), accessed September 25, 2016, <http://www.jmu.edu/cisr/journal/10.1/feature/ressler/ressler.shtml>, p. 6.

Article 3(1) is clear that when a user of explosive ordnance no longer controls the territory after hostilities cease, the user shall “provide where feasible, *inter alia*, technical, financial, material or human resource assistance, bilaterally or through a mutually agreed third party...to facilitate the marking and clearance, removal or destruction of such explosive remnants of war.” As such, the Article explicitly requires the user of explosive ordnance which no longer controls the territory to actively assist in the cleanup and/or destruction of ordnance. The significance of this Article is noted by the International Committee of the Red Cross, which holds that the above language was a “major improvement” from the initial text which “contained an obligation for the parties to clear explosive remnants of war in territory under their control, but merely ‘to cooperate’ with the other side in clearance of those weapons in other areas.”³

Article 4 specifies that the user of explosive ordnance, even if no longer in control of the territory, must “facilitate the rapid marking and clearance, removal or destruction of explosive remnants of war.” Paragraph two further requires the prior user of explosive ordnance to make relevant information available to the new party in control “without delay”. Similar to Article 3, Article 4 also requires specific actions on behalf of the user of ordnance to assist with the clearance of UXO and to do so promptly. Accordingly, U.S. cleanup responsibility is required under relevant articles, for it deployed ordnance that did not explode during the War, and it also abandoned UXO upon its departure from Vietnam which thereby continue to be “explosive remnants of war.” While the U.S. has never explicitly denied its responsibility under this provision, its forty-year silence on the matter may only be interpreted as a refusal to comply.

Article 7(1) states that each High Contracting Party has the right to seek and receive assistance from other High Contracting Parties in “dealing with the problems posed by existing

³ Maresca, “A New Protocol”, p. 827.

explosive remnants of war”, and 7(2) requires respective states to actually provide the assistance. This means that Vietnam has the right to seek and receive assistance from the U.S. for cleanup of unexploded ordnance, and that the U.S. is required to provide assistance upon request. To date, the U.S has yet to provide requisite assistance although it was requested by Vietnamese authorities. Critiques of the Protocol hold that although the sharing of information was widely supported in the drafting of the Protocol, providing it can be a painstakingly slow process due to lack of necessary mechanisms for information sharing.⁴

Relatedly, Protocol V includes a Technical Annex which “contains suggested best practice for achieving the objectives contained in Articles 4, 5 and 9 of this Protocol”, and is to be “implemented by High Contracting Parties on a voluntary basis.” Article (1)(a)(iv) of the Annex states that when a State Party has abandoned explosive ordnance in the course of operations, it should “leave abandoned explosive ordnance in a safe and secure manner...” when rather abruptly and abandoning its ordnance. This Article contains explicit provisions about post-war departure procedures and abandonment of ordnance, which suggest that it applies to U.S. cleanup responsibility in Vietnam.

To summarize the foregoing requirements of CCW Protocol V on Explosive Remnants of War as they apply to the U.S.:

1. The Protocol pertains to the types of explosive weapons used by the U.S. in Vietnam,
2. It pertains to the ordnance that remain unexploded as “remnants” of the War,
3. Its pertains to the geographical area where the weapons were used, namely Vietnam,
4. The U.S. was the responsible user party that employed the weapons that remain unexploded,

⁴ Maresca, "A New Protocol", p. 827.

5. The responsible party is required to maintain or leave its remaining explosive ordnance in a safe and secure manner,
6. The responsible party is required to remove its explosive munitions once hostilities cease,
7. The responsible party is to actively engage in all related cleanup activities, and
8. If the responsible party no longer controls the territory in question, it must *rapidly* facilitate removal and destruction of remaining explosive remnants through international cooperation including the sharing of detailed information available.

The United States fulfilled none of the obligations enumerated above, and this failure is now an integral part of the international legal and historical record. While the United States has never sought to address, let alone explain, its lack of adherence to this Protocol, we can evaluate pertinent language or search for mitigating factors that might be seen to obviate its burden of responsibility.

First, and perhaps paramount, is that although the U.S. ratified both the CCW and Protocol V, neither of them existed at the time of the Vietnam War. It could be argued that the lapse of time from the end of the War until the U.S. ratification of the Convention (1995) and Protocol V (2009) makes their application to U.S. actions from years prior of questionable relevance. The matter of timing illustrates an important consideration in international law, namely whether agreements may apply retroactively, in this case requiring the cleanup of left-behind weapons that occurred prior to the drafting of CCW. It is generally accepted in the field of international law that retroactivity does not apply unless explicitly stated and agreed to by relevant parties. As to the specific case of Vietnam under Protocol V, “no past weapons treaty

has imposed retroactive responsibility on user states to assist with the clearance of failed weapons.”⁵

Nevertheless, debate over the matter of retroactivity continues with some arguing that moving to apply provisions to past conflicts would “provide an important mechanism through which states and the users of explosive ordnance in past wars can work to address an existing problem.”⁶ It also happens that addressing the clearance of explosive remnants of war from conflicts prior to the adoption of the CCW proved to be a major point of contention during negotiations regarding Protocol V. The question of whether the Protocol should address the clearance of ordnance already on the ground, or instead apply only to future conflicts, was one of the last issues to be resolved.⁷ Article 7 of the Protocol was finalized to allow for some flexibility in applying requirements retroactively on aggressor states, while also seeking to give recourse to impacted states.

But even prior to the Convention, precedent existed in the application of law for holding states that committed past violations responsible for remediation. “Several international bodies, including the Human Rights Committee and the European Court of Human Rights, have held that states can be made responsible for rectifying past actions that cause present harm.”⁸ Environmental law, for example, “has established the principal that polluters should clean up foreseeable contamination even if it predates the relevant legal instrument...”⁹ In this regard, Law Professor Bonnie Docherty notes that, “basic treaty law allows for the inclusion of such a

⁵ Bonnie Docherty, "Breaking New Ground: The Convention on Cluster Munitions and the Evolution of International Humanitarian Law," *Human Rights Quarterly* 31, No.4 (2009), p. 953.

⁶ Maresca, "A New Protocol", p. 830.

⁷ Katherine Harrison, and Richard Moyes, “Ambiguity in Practice: Benchmarks for the Implementation of CCW Protocol V”, *Land Mine Action*. 2009, accessed November 23, 2016, <http://www.article36.org/wp-content/uploads/2010/08/ambiguity-in-practice.pdf>, p. 30; Maresca, "A New Protocol", p. 830.

⁸ Docherty, "Breaking New Ground", p. 954.

⁹ Docherty, "Breaking New Ground", p. 954.

provision in weapons treaties... including those that predate a treaty. While a treaty is not normally retroactive it can be if different intention appears from the treaty or is otherwise established.”¹⁰ In the case of Protocol V, the intention is clear: to limit or prevent physical harm and death.

With unexploded weapons continuing to cause present harm, the Vietnam War cannot be considered simply a past conflict, with the continuing deaths of civilians somehow overlooked by the CCW. No logical application of Protocol V—clearly established to protect civilians from post-war harm—could be interpreted to mean that it is permissible to let people suffer and die even today, because of the technicality that the deadly weapons were dispersed at an earlier time. It is in this sense—with Vietnam War deaths continuing more than a decade after establishment of relevant international law—that Protocol V can be held to apply now, meaning that the United States bears responsibility for cleanup of its weapons left in Vietnam.

With the defense of non-retroactivity set aside, another argument that treaty law does not place responsibility on the U.S. may be found in various qualifying phrases in the text of the Protocol. Some of the language is unclear or seemingly optional such as that assistance for clearance of explosive remnants of war should occur "where appropriate" or "as necessary and feasible.” Various legal authorities note that the ambiguity of these qualifiers “introduces an element of discretion that could weaken the obligations.”¹¹ But to turn responsibility for cleanup from mandatory action into a discretionary decision weakens the entire framework, with the

¹⁰ Docherty, "Breaking New Ground", p. 954. (See also International Law Commission, "Draft Articles of Responsibility for States for Internationally Wrongful Acts with Commentary," *United Nations Yearbook of the International Law Commission*, 2, No. 2, Art. 13 (2001)).

¹¹ "The Law of Armed Conflict and the Use of Force." In *The Max Planck Encyclopedia of International Law*, edited by Frauke Lachenmann, and Rudiger Wolfrum (Oxford: Oxford University Press, 2017), p. 1070.

possible good-will of individual states serving as a case-by-case substitute for legal responsibility.

Moreover, in the years following the War, the U.S. and Vietnam remained hostile actors, not in terms of weapons of war but with respect to weapons of ideology. The U.S. may have had no meaningful way to assist with the removal of explosive ordnance. Even were the U.S. to bear legal responsibility for cleanup of ordnance, it remains an open question whether its military records could sufficiently identify the areas where unexploded cluster bombs and other ordnance remained.¹²

Additional challenges persist, undermining the efficacy of the Convention on Certain Conventional Weapons. Similar to issues posed by the abovementioned qualifying phrases, a point of contention also arose from the term “superfluous injury” introduced in the Preamble. Although Protocol V itself does not include this particular language, the criteria for “superfluous injury” was left undefined and ambiguous for some time. It was later resolved by a group of doctors who defined the term as injury that causes “permanent disability, disease other than the traumas normally caused by explosions or projectiles, virtually inevitable death in the field, a very high degree of mortality in hospital settings, or particularly severe injuries.”¹³ Legal experts note that the purpose of establishing such criteria was so “states at the national level and in international forums [could] assess the legality of new weapons”, yet they also note that because said criteria “has not been validated internationally...it may not be concluded, in the current state of law, that a new conventional weapon could be considered prohibited solely because it does not

¹² Maresca, "A New Protocol", p. 827.

¹³ Yves Sandoz, “Convention of 10 October 1980 on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which may be Deemed to be Excessively Injurious or to have Indiscriminate Effects (Convention on Certain Conventional Weapons)”, *United Nations Audiovisual Library of International Law (Travaux Préparatoires)*, 2010., accessed January 15, 2017, http://legal.un.org/avl/pdf/ha/cprccc/cprccc_e.pdf, p. 3.

meet those criteria.”¹⁴ Just as the qualifying phrases weaken convention provisions, so too, does this type of ambiguity. It provides opportunity for states to flout their responsibility for cleanup.

Perhaps it is reasonable to expect that in a complex body of international law ambiguities and differing interpretations are inevitable, in this case for example, leaving the assignment of responsibility to be ironed out almost on an *ad hoc* basis. But the overall import of Protocol V—its clear purpose and intent at the time of U.S. ratification—is to limit or prevent the physical harm and death of innocent civilians from explosive remnants of war. Perhaps the reason that U.S. authorities have never denied responsibility for the cleanup of its left-behind UXO is because its culpability is clear.

We turn now to the Convention on Cluster Munitions, a second example of relevant international law pertaining to responsibility for the cleanup of ordnance left in Vietnam.

CONVENTION ON CLUSTER MUNITIONS (2010)

The Convention on Cluster Munitions (CCM), which the U.S. has never ratified, bans altogether the development, production, stockpiling, and transfer of certain munitions, and “addresses the humanitarian consequences and...harm to civilians caused by [such] munitions.”¹⁵ The Convention emerged in response to growing concern about the legitimacy and impacts of cluster munitions on civilians¹⁶, and notes that “...cluster munition remnants kill or maim civilians...obstruct economic and social development...impede post-conflict rehabilitation

¹⁴ Sandoz, “Convention of 10 October 1980 on Prohibitions”, p. 3.

¹⁵ The Convention on Cluster Munitions, accessed on January 18, 2017, <http://www.clusterconvention.org/>, p. 1.

¹⁶ Lisa Farrah Ho, “Negotiating the Convention on Cluster Munitions: Lessons Learnt,” *Singapore Management University*. Accessed January 15, 2017, <http://www.e-ir.info/2014/05/07/negotiating-the-convention-on-cluster-munitions-lessons-learnt>, p. 2.

and reconstruction...[and] can negatively impact national and international peace-building and humanitarian assistance efforts, and have other severe consequences that can persist for many years after use.”¹⁷ It is to be noted that the call for a ban on cluster munitions arose from the aftermath of the Vietnam War¹⁸ in which millions of bomblets (small bombs stored in a mother lode) were deployed indiscriminately across that country.

It may be asked what the relevance of the CCM might be to U.S. post-war responsibility since the U.S. has never ratified the Convention, but the failure to put pen to paper does not always exempt states from global obligations. A “rogue nation,” for example, refusing to accept extant rules of international governance, would not necessarily be considered exempt from prohibited or unlawful behaviors simply because it claimed it was not covered by existing international treaty law. An international community exists and certain behaviors are expected if not demanded.

Although states drafted the Convention with notable speed, several debates surfaced during the process. Proponents of the Convention reasoned that cluster munitions should be banned because they “lend themselves easily to attacks that strike combatants and civilians alike”, whereas those in opposition contended that international law already suffices in prohibiting indiscriminate attacks, and that cluster munitions are “not incapable of being used discriminately.”¹⁹ Instead of instituting a total ban, drafters advocated for establishing restrictions based on technical reliability criteria “such as a less than 1% failure rate.” The counter argument, which eventually prevailed, was that failure rates derived from perfect test

¹⁷ The Convention on Cluster Munitions, accessed on January 18, 2017, http://www.un.org/en/genocideprevention/documents/atrocity-crimes/Doc.47_conv%20cluster%20munitions.pdf, p. 1.

¹⁸ Sandoz, “Convention of 10 October 1980 on Prohibitions”, p. 5.

¹⁹ Kevin Riordan, “Convention on Cluster Munitions”, *United Nations Audiovisual Library of International Law (Travaux Préparatoires)*, accessed February 10, 2017 <http://legal.un.org/avl/ha/ccm/ccm.html>, p. 1.

conditions rarely represented the volatile conditions of actual combat.²⁰

The United States became one of the countries to opt out of signing the Convention. It did not support a blanket ban, maintaining that cluster munitions can produce less collateral damage than unitary weapons. It also expressed concern that signing the Convention might obviate its ability to cooperate with, or participate in, military and humanitarian relief missions because its ships and forces often carried cluster munitions.²¹ In addition to the U.S., several other prominent nations also remain outside of the Convention, including Russia, China, Pakistan and Israel. Legal experts note that although cluster munitions clearly have been used by non-Party states since the entry into force of the Convention, the stigmatizing effect of doing so often results in condemnation from the global community.²²

While the United States has not signed this convention, several CCM protocols are relevant to obligations to clean up its buried ordnance, as will become clear shortly. Moreover, since cluster munitions are among the conventional weapons the U.S. deployed extensively during the Vietnam War, American weaponry falls under the category now widely outlawed under developing international standards.

Specific articles, in fact, assign responsibility for the cleanup of cluster munitions. Article 4(4)(a), for example, applies to cases where cluster munitions have been used or abandoned by a State Party prior to entry into force of the Convention for that State Party, and that are located in areas under the jurisdiction or control of another State Party at the time of entry into force of this Convention. It requires the responsible State Party to provide various means mentioned therein to assist the Latter Party with the marking, clearing, and destruction of remaining munitions. The

²⁰ Riordan, “Convention on Cluster Munitions”, p. 1.

²¹ Jeff Abramson, “Treaty Analysis: The Convention on Cluster Munitions,” *Arms Control Association*, accessed January 25, 2017, https://www.armscontrol.org/act/2008_12/CCM, p. 5.

²² Riordan, “Convention on Cluster Munitions”, p. 2.

Article also requires the responsible State Party to assist in providing detailed information about the quantity and location of clusters to the State Party now in control of the land. Because of the maintenance of detailed U.S. military records during the War, particularly as revealed through the research of Dr. Jeanne Stellman discussed previously, there is little doubt but that the U.S. has the capacity to provide such information to Vietnam due to the known existence of its detailed records.

Finally, Article 6(6) places direct responsibility on the former States Parties (in this instance the United States) to provide “emergency assistance” to the currently affected State Party (Vietnam). This Article directly pertains to the situation of the U.S. and Vietnam, where cluster munitions have now become explosive remnants after entry into force of the Convention. It requires that responsible States Parties, in a position to do so, “urgently provide emergency assistance to the affected State Party”, an obligation that would certainly extend to the United States, had it signed the Convention. Notwithstanding its clear language, however, Article 6(6) includes a qualifying phrase (“in a position to do so”) that diminishes its legal muscle and may leave its requirements up for debate.

The following arguments may be offered as to why the U.S. bears little or no responsibility, at least under the provisions of the CCM. Article 4(4)(a), for example, adds the caveat that the state, as described above, is “strongly encouraged to provide” the various kinds of cleanup assistance mentioned. An encouragement, no matter how fervently stated, is neither a command nor an actual requirement of international law. As such, the United States as the former State Party may elect not to respond to such encouragement.

Similarly, the U.S. may decline to offer information about the quantities and locations of cluster munitions simply by claiming that it either no longer has such records, or that it is too

burdensome to research, organize, and share them. Even if such a position were untrue, the declaration that it is true leaves little room for pursuing U.S. legal obligations in the matter. While there is no evidence the U.S. made such a claim, its forty-year silence on the matter suggests that it nevertheless considers itself exempt from cleanup responsibility and related obligations.

Were the issue of ordnance and U.S. cleanup responsibility brought to light, the U.S. could also claim that it offered emergency assistance to the best of its ability as required by Article 6(6) or, alternatively, that it was prepared to provide assistance but that the Vietnamese government did not respond positively so as to encourage or accept such assistance. All evidence, however, indicates that neither offer was ever made.

Aside from potential U.S. claims of exemption from the provisions of the CCM, this convention—particularly coupled with Protocol V of the CCW addressed earlier—establishes a tight and widely accepted standard that states are obligated to clean up their still-live weaponry following conflict. In this sense, even if the U.S. has not agreed to refrain from future use of cluster munitions, nations are considered responsible for the cleanup of previously-deployed weaponry, especially those that continue to kill people today.

We may now ask what the relevance of the CCM is to U.S. post-war responsibility since the U.S. is not a State Party to the Convention. The U.S. has expressed its recognition of the consequences of cluster munitions²³ and condemned their use in certain circumstances.²⁴ It has otherwise operated in general compliance with the essence of the CCM by notably limiting its

²³ Stephen D. Mull, Acting Assistant Secretary of Political-Military Affairs, “U.S. Cluster Munitions Policy”, on-the-record briefing, *United States State Department*, May 2008, <https://2001-2009.state.gov/t/pm/rls/rm/105111.htm>, p. 1; Megan Burke, “Growing Global Investment in Cluster Munitions Despite International Bans Against Use.” *Cluster Munition Coalition*, June 2016. <https://www.ngoadvisor.net/cluster-munitions-investment>, p. 2.

²⁴ “Cluster Munition Coalition Urges No Use of Cluster Munitions by US and Others in Syria and Iraq,” *Cluster Munition Coalition*, September 2014. <http://www.stopclustermunitions.org/en-gb/media/news/2014/cluster-munition-coalition-urges-no-use-of-cluster-munitions-by-us-and-others-in-syria-and-iraq.aspx#>, p. 1.

use of cluster munitions,²⁵ and has restricted its production and trade of such weapons.²⁶ The reservations the U.S. has expressed about the Convention have more to do with matters of practicality than with substantive lack of commitment to the Convention.

It is in this sense that major provisions of the CCM—particularly those regarding the responsibility to clean up buried cluster munitions—are relevant to the United States. By expressing its general agreement with the CCM, and by purporting to follow many of its key provisions, the U.S. has sought public recognition as being in support of the CCM even though it has never ratified the Convention as such. Indeed, the U.S. is on record not only as being supportive of the CCM, but as being *obligated* to its clean up provisions.

The Acting Assistant Secretary of State, Stephen D. Mull, has noted that “the United States is deeply concerned about the humanitarian impact of cluster munitions...it’s an absolute moral obligation to clean up—to do everything that you can do to clean up after a conflict to make sure that there aren’t innocent victims of weapons that are left lying on the ground.”²⁷

Thus, as a matter of stated policy and governmental practice, the United States acknowledges responsibility under the key provisions of the Convention on Cluster Munitions. This is, without question, true of its responsibility to clean up its left-behind cluster bombs. But the reality is that it has not done so in Vietnam.

We now turn from the use and cleanup of explosive ordnance under international treaty law to the related matter of America’s widespread spraying of the defoliant Agent Orange and the impact of its chemical derivative, deadly dioxin, on Vietnamese civilians.

²⁵ Sewell Chan, “Report Finds Ban Hasn’t Halted Use of Cluster Bombs in Syria or Yemen.” https://www.nytimes.com/2016/09/02/world/middleeast/cluster-bombs-syria-yemen.html?_r=0, p. 2.

²⁶ Chan, “Report Finds Ban Hasn’t Halted Use of Cluster Bombs in Syria or Yemen”, p. 2.

²⁷ Mull, *United States State Department*, p. 1.

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In contrast to international conventions that address the use of weapons and removal of unexploded ordnance, fewer pertain to the use and disposal of chemical weapons during and after war. Of the conventions listed in the repository of the United Nations Treaty Collection, two relatively recent ones pertain to chemical weapons: the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), and the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction (CWC). Both conventions explicitly prohibit the use of chemical weapons, but their relevance to U.S. use of Agent Orange and its possible liability for cleanup and removal of dioxin residue largely hinges upon analysis and interpretation of relevant provisions.

It is important to note, particularly with relevance to the possible application of these conventions to the United States, the 1925 Geneva Gas Protocol stating that, “Whereas the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the world...[and] to the end that this prohibition shall be universally accepted as part of International Law, binding alike the conscience and the practice of nations... that the High Contractive Parties, so far as they are not already Parties to treaties prohibiting such use, accept this prohibition.”²⁸

²⁸ 1925 Geneva Protocol: Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous, or Other Gases, and of Other Bacteriological Methods of Warfare, Geneva, 17, June 1925, accessed January 19, 2017, https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Bio/pdf/Status_Protocol.pdf, p. 1.

While this Geneva Protocol grew out of World War I, largely in response to the widespread use of deadly “mustard gas” on warring troops, it served in many ways as a foundational basis for the subsequent treaties that came years later.

CONVENTION ON THE PROHIBITION OF MILITARY OR ANY OTHER HOSTILE USE OF ENVIRONMENTAL MODIFICATION TECHNIQUES (ENMOD) (1977)

The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) entered into force two years after the U.S. left Vietnam, and was ratified by the U.S. in 1980, as one of seventy-seven States Parties. It prohibits the engagement with “military or any other hostile use of environmental modification techniques having widespread, long-lasting, or severe effects as the means of destruction, damage, or injury to any other State Party.”²⁹ It was established to call attention to the potential negative effects that scientific and technological advances can have on human welfare and on the environment, and “renounce the use of climate modification techniques for hostile purposes.”³⁰ Such concerns had surfaced in the international arena during the early 1970s, in the shadows of the Vietnam War and in no small part due to America’s widespread use of the defoliant chemical, Agent Orange.³¹

The ENMOD Convention clearly prohibits States Parties from engaging in war-time use of environmental modification techniques having a major destructive impact on another State

²⁹ United Nations, “Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques”, accessed February 10, 2017, <http://www.un-documents.net/enmod.htm>, p. 1.

³⁰ United Nations Office for Disarmament Affairs, “Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques”, <https://www.un.org/disarmament/geneva/enmod>, p. 1.

³¹ Antoine Bouvier, “Protection of the Natural Environment in Time of Armed Conflict,” *International Review of the Red Cross* 285 (1991), accessed February 10, 2017, <https://www.icrc.org/eng/resources/documents/article/other/57jmau.htm>, p. 1.

Party. When determining the application of the ENMOD Convention to the United States' use of Agent Orange in Vietnam and potential responsibility for cleanup of residue, there are two considerations of particular relevance: determination of whether the definition of *environmental modification technique* includes the use of Agent Orange, and also whether and how the Convention applies to U.S. actions during and after the War.

It is often considered by legal scholars that ENMOD does not apply to the use of Agent Orange in Vietnam, although the case is by no means closed. U.S. concern about the matter began during the treaty negotiation process itself, with the expression of “serious reservations” regarding the joint treatment of arms control and the laws of war, reasoning that the combination of these two issues might contribute to confusion and impact the treaty’s efficacy. The U.S. suggested that a special interagency level review be conducted to address concerns before proceeding with negotiations. As a result various policy analysts, including those from the Arms Control and Disarmament Agency who reviewed the U.S. position “found it to be almost incomprehensible.”³²

This caustic observation notwithstanding, the U.S. proceeded to ratify ENMOD, while thereafter proclaiming its strongly held position that the Convention did not necessarily prevent the use of herbicides in armed conflict. “The United States has, as a matter of national policy, renounced the first use of... herbicides with certain limited exceptions...using herbicides in armed conflict requires Presidential approval.” The two reservations carved out by the U.S.—“first use” and “Presidential approval”—were accepted by some of the other States Parties and rejected by others. Australia, for instance, noted that, “Environmental modification techniques

³² United States Department of State, *Office of the Historian, Bureau of Public Affairs: 199. Memorandum from David Elliott of the National Security Council Staff to the President’s Assistant for National Security Affairs (Scowcroft)*, accessed February 12, 2017, <https://history.state.gov/historicaldocuments/frus1969-76ve14p2/d199>, p. 1.

are prohibited... [such as] defoliant chemicals.”³³ Australia went on to note that the use of Agent Orange, as applied by the U.S. during the Vietnam War, was now outlawed by ENMOD.

Commensurate with the position of Australia, the United Nations General Assembly in 1969 (during the Vietnam War itself) condemned the use of herbicides in Vietnam.³⁴ The General Assembly, however, is not a law-making body and is granted only the power to make recommendations by the UN Charter. Its position was recognized as relevant only insofar as developing customary international law. The role of the U.S. with respect to use of Agent Orange, while never tested as such in the Security Council which does have powers to make decisions about international law, was litigated in federal court in the United States (2008). Plaintiffs alleged that the use of Agent Orange during the Vietnam War violated customary norms and standards pertaining to poisonous weapons. The U.S. Court of Appeals, however, ruled that Plaintiffs had failed to demonstrate a violation of international law because the use of chemical defoliants was not yet a universal norm in the 1960s, and also because the U.S. had expressed reservations to the applicability of ENMOD at the time of ratification.³⁵

To date no court cases and no international bodies have ruled that ENMOD pertains to U.S. use of Agent Orange during the Vietnam War. On the other hand, no relevant parties have ruled that U.S. actions were in keeping with either the spirit of the Convention or the direction of developing international law. Given the evolving nature of international treaty law, it is important to further examine key arguments and developments regarding the possible relevance of ENMOD.

³³ Australian Defense Headquarters Publication 06.4, 4.11 and 7.17. *The Manual of the Law of Armed Conflict*, May 11, 2006, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule76, p. 1.

³⁴ “Practice Relating to Rule 76. Herbicides”, *International Committee of the Red Cross*, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule76, p. 1.

³⁵ United States Court of Appeals for the Second Circuit, *Vietnam Association for Victims of Agent Orange, et al v. Dow Chemical Company, et al*, Judgment, February 22, 2001, accessed February 14, 2017, <https://www.state.gov/documents/organization/98481.pdf>, p. 8.

To the first point, Agent Orange does seem to encompass relevant criteria as an environmental modification technique: *widespread, long-lasting, and severe destruction*. Its spraying was certainly widespread, blanketing over 4.5 million acres of land; it was long-lasting in that spraying continued for an entire decade and its aftermath for decades more; and it clearly upset the ecological balance, causing “significant disruption or harm to human life [and] natural and economic resources...” such as persistent physical deformities and environmental contamination and destruction.³⁶

It also is well-established science that dioxin adversely impacts the environment and human health as referenced in Article 2. Some twenty years after the entry into force of ENMOD, for example, scholars concluded that the use of herbicides can “be equated with environmental modification techniques under Article 2 of the Convention.”³⁷

Moreover, Article 2 also states that the list of examples therein is not exhaustive [and] other phenomena which could result from the use of environmental modification techniques could appropriately be included,” suggesting that Agent Orange fits within the definition of an *environmental modification technique* due to its long-term environmental impact. In this vein, the International Committee of the Red Cross pointedly notes that “an example of [environmental modification techniques] is defoliant chemicals used by militaries to deprive the enemy of ground cover or kill food crops”, and that “the United States used Agent Orange during the Vietnam War for this purpose...”³⁸ Similarly, the United Nations Environmental Program has held that “the ENMOD Convention was established as a reaction to the military tactics employed

³⁶ United States Department of State, *Bureau of International Security and Nonproliferation, Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques: Understandings Regarding the Convention: Understandings Relating to Article I, paragraph. C*, accessed on February 14, 2017, <https://www.state.gov/t/isn/4783.htm#understandings>, p. 1.

³⁷ Antoine Bouvier, "Recent Studies on the Protection of the Environment in Time of Armed Conflict," *International Review of the Red Cross*, 32, No. 291 (1992), p. 554.

³⁸ “Practice Relating to Rule 76. Herbicides”, *International Committee of the Red Cross*, p. 1.

by the United States during the Viet Nam War...the Convention was also a reaction to the use of large quantities of chemical defoliants...”³⁹ The positions of these various experts and their institutional counterparts, coupled with Convention language stating that its list of environmental modification is not exhaustive, suggests that the final applications of ENMOD provisions to the use of dioxin may not be settled law.

Whether the use of Agent Orange and dioxin in Vietnam was legal is but one issue to consider. Another key consideration is the application of ENMOD to U.S. responsibility for cleanup of Agent Orange residue. Article 5(5) requires “each State Party...to provide...assistance...to any State Party which so requests, if the Security Council decides that such party has been harmed or is likely to be harmed as a result of violation of the Convention.”

Records indicate that Vietnam did request U.S. assistance with the cleanup of Agent Orange, and the U.S. did respond, albeit minimally, to that request.⁴⁰ But U.S. assistance came some thirty-five years after giving dioxin the time to poison Vietnamese soil, contaminate water supplies, and harm human health for generations through changes in DNA. Moreover, the funding provided by Congress through the U.S. State Department came in meager amounts given the scope of the threat faced by the Vietnamese people. And its limited reach was narrowly focused on cleanup around former U.S. military storage units with little if any focus elsewhere.

³⁹ “Protecting the Environment During Armed Conflict: An Inventory and Analysis of International Law,” *United Nations Environmental Program* (2009), http://www.un.org/zh/events/environmentconflictday/pdfs/int_law.pdf, p. 12.

⁴⁰ “Environmental Remediation”, USAID, , accessed February 10, 2017, <https://www.usaid.gov/vietnam/environmental-remediation>, p. 1.

CONVENTION ON THE PROHIBITION OF THE DEVELOPMENT, PRODUCTION,
STOCKPILING AND USE OF CHEMICAL WEAPONS AND ON THEIR DESTRUCTION
(1997)

The thawing of relations between the U.S. and Russia in the 1980s and 1990s permitted the international community to focus not only on nuclear weapons but also on the use and impact of chemical weapons. Knowledge and even visual documentation of chemical attacks, particularly against civilian populations, elicited outrage from the international community, pushing to the forefront the drafting of a new agreement to prohibit the use of such highly toxic weapons.⁴¹

The Chemical Weapons Convention (CWC) stemmed in part from the 1925 Geneva Protocol prohibiting the use of chemical weapons under any circumstances, and entered into force in 1993, with 192 States Parties including the U.S. ratifying it in 1997. It contains twenty-four articles which collectively “prohibit the development, production, stockpiling and use of chemical weapons...,”⁴² with the opening article establishing that “never under any circumstances” should States Parties “engage in any military preparations to use chemical weapons.”⁴³ The CWC also “provides for assistance to and protection of states attacked or threatened with chemical weapons...restrictions on the transfer of certain chemicals to non-States Parties, and sanctions in response to grave violations of its provisions.”⁴⁴

The CWC defines chemical weapons as “toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention...”⁴⁵ It in turn defines toxic

⁴¹ “Genesis and Historical Development”, Organization for the Prohibition of Chemical Weapons (OPCW), accessed February 10, 2017, <https://www.opcw.org/chemical-weapons-convention/genesis-and-historical-development>, p. 2.

⁴² Chemical Weapons Convention, Article 1.

⁴³ Ibid, Article 1 (c).

⁴⁴ Ibid, Article 10.

⁴⁵ Ibid, Article 2 (1)(a).

chemicals as, “Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals [and] includes all such chemicals, regardless of their origin...”⁴⁶

During the drafting of the Convention the Organization for the Prohibition of Chemical Weapons noted that in order “to address the potential threat posed by chemicals, the CWC definition of chemical weapons had to be as comprehensive as possible.”⁴⁷ This led to the inclusion of various classes of named chemicals and chemical compounds in appendices of the convention, although Agent Orange and dioxin were unmentioned, either under their chemical names or trade names. It could be argued that this omission was intentional, for whatever reason, although treaty appendices often are illustrative and not comprehensive. It also could be argued that the level of dioxin in Vietnam was indeterminable or variable although it was sprayed in quantities exceeding international maximum exposure standards. But because dioxin impairs both humans and animals, and is associated with elevated risks of birth defects and adverse health outcomes in humans including cancers, and infertility, it is widely accepted as a toxic chemical and carcinogen.⁴⁸ Moreover, neither the United States nor any other nation is on record as denying that Agent Orange or its dioxin derivative is covered by the CWC. Given the clarity of Convention language, the firm scientific evidence regarding the nature of relevant chemical compounds, and the lack of any reservations expressed regarding dioxin, no reasons exist to doubt that this chemical is covered by the CWC.

⁴⁶ Ibid, Article 2 (2).

⁴⁷ “Brief Description of Chemical Weapons”, Organization for the Prohibition of Chemical Weapons, accessed February 10, 2017, <https://www.opcw.org/about-chemical-weapons/what-is-a-chemical-weapon>, p. 2.

⁴⁸ “IARC Monographs on the Evaluation of Carcinogenic Risks to Humans”, Polychlorinated Dibenzo-para-Dioxins and Polychlorinated Dibenzofurans, Volume 69, *World Health Organization International Agency for Research on Cancer*.

With this established, the Convention further requires that, “Each State Party undertake[s] to destroy all chemical weapons it abandoned on the territory of another State Party, in accordance with the provisions of the Convention.”⁴⁹ The CWC goes on to define *abandoned chemical weapons* as “weapons, including old chemical weapons, abandoned by a state after 1 January 1925, on the territory of another state without the consent of the latter.”⁵⁰ The definition of *abandoned chemical weapons* is particularly pertinent to the United States’ use of Agent Orange because the chemical compound was utilized and abandoned by the U.S. well after the year 1925, and it was used and abandoned on the territory of another state (Vietnam) without its consent.

Moreover, the Convention language not only requires the destruction of the chemicals themselves, but also the destruction of chemical weapons production and storage facilities “constructed or used since 1 January 1946.”⁵¹

On its face it would be legitimate to ask whether the United States, having left Vietnam after the War, having left its chemical weapons and storage facilities in Vietnam, and thereafter having a lengthy period of ideological conflict with the government of Vietnam, actually had the opportunity to exercise any of its cleanup responsibilities as set forth by the Convention. It is arguable perhaps, that from 1975 until the late 1980s continuing hostilities could have limited U.S. capacity to do so. But as relations with Vietnam began to improve, and by the time the Convention went into effect in 1997, no such rationale could be offered for the failure to reach out to Vietnam to fulfill this responsibility.

⁴⁹ Chemical Weapons Convention, Article 1 (3).

⁵⁰ Ibid, Article 2 (6).

⁵¹ Ibid, Article 2 (8).

The U.S. did not initiate action on this matter and, in fact, did not discuss cleanup on a bilateral basis with the government of Vietnam until more than a decade later. The U.S. also failed to recognize other responsibilities it held under yet other treaty articles. Article 3 (1)(b) requires that States Parties must declare whether they abandoned chemical weapons production facilities and, if so, provide a plan for their destruction. While its abandoned facilities no doubt were under the control of Vietnam by the time the CWC went into effect, the U.S. nevertheless failed to provide the government of Vietnam with information on the facilities it left behind, to suggest a plan of action to destroy them, or to make an offer to provide assistance with their destruction.

The U.S., along with other state signatories, also agreed to take steps to destroy all chemical weapons within a particular time frame, starting no later than two years after entry into force of the agreement. As with the above matter, this deadline also was ignored by the United States for at least a decade.

The CWC further requires responsible States Parties, in this case the U.S, to meet the costs of cleanup, both of the chemicals and their related facilities.⁵² As noted in Chapter 3, although some U.S. funding for cleanup finally was appropriated starting in 2010, it was most meager in nature, based on no analysis of overall costs, and dribbled out at the largesse of Congress largely based on the determined efforts of U.S. Senator Patrick Leahy.

To this point, and based on the foregoing Chemical Weapons Convention obligations as they apply to the United States:

⁵² Ibid, Articles 4 (16) and Article 5 (19).

1. The CWC bans use of a wide variety of chemical weapons from use by states in armed conflict, including Agent Orange and dioxin, (toxins used by the United States in Vietnam some years prior to entry into force of the Convention),
2. States are required to destroy chemical weapons they abandoned on the territory of other states,
3. States are required to destroy abandoned chemical weapons and storage facilities as well,
4. States must declare what they abandoned (types of chemicals weapons, locations and amounts),
5. States must assist in the destruction of chemical weapons and facilities if they no longer control the territory where they reside,
6. States must carry out these responsibilities starting two years after the Convention entered into force in 1997, and
7. States must pay for the costs of the cleanup/destruction of their abandoned chemical weapons.

The United States fulfilled few of the legal responsibilities enumerated above. For years after the Convention went into effect it took no steps to destroy the chemicals weapons it had abandoned in Vietnam, and it did not take steps to destroy its abandoned chemical storage facilities (2 and 3 above). It also failed to declare and share information regarding the chemical weapons it had abandoned in the country or to offer to assist in the cleanup of sites, including the required destruction of chemical weapons and facilities (4 and 5 above). The U.S. also failed to meet the timeline set by the Convention (6 above), and treated the support it did provide for

cleanup (starting more than three decades after it left Vietnam and years after the CWC itself went into force) more as a gesture of limited largesse than a carefully considered and formal legal act of international responsibility. And, as will be addressed in the next chapter, even the original use of Agent Orange and dioxin in Vietnam, while not violating provisions of the CWC at the time because they did not yet exist, violated the Geneva Protocol of 1925, prohibiting the use of chemical weapons under any circumstances, including “asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices [and] bacteriological methods of warfare.”⁵³ Moreover, the Geneva Protocol is accepted as a rule of existing international law.⁵⁴

Nevertheless, with the CWC carrying the force of more recent international law, it is reasonable to ask if mitigating factors might have prevented the U.S. from complying with its provisions. Are their factors for instance that might explain or even justify such noncompliance? With the U.S. government virtually silent regarding its duties and responsibilities under the CWC as it pertains to Vietnam, the only factor that has even been mentioned in the scholarly literature is that of retroactivity. The U.S. left Vietnam in 1973, at which time it abandoned the weapons now covered by the Convention, which itself went into effect in 1997. Does the CWC then apply only as of 1997, thereby possibly absolving the United States of responsibility under the provisions we have considered?

On this point the Chemical Weapons Convention is equally clear: relevant provisions establish U.S. responsibility retroactively, that is for years even prior to U.S. ratification. As noted, the Convention clearly establishes retroactive responsibility extending back as far as 1925. Each State Party must undertake to “destroy all chemical weapons it abandoned on the territory

⁵³ 1925 Geneva Protocol, p. 1.

⁵⁴ United Nations GAOR, Res. 2603-A, 24th Session, “Question of chemical and bacteriological (biological) weapons”, December 16, 1969, p. 9.

of another State Party...,”⁵⁵ including all “chemical weapons, abandoned by a state after 1 January 1925 on the territory of another state without the consent of the latter.”⁵⁶ Thus, all States Parties to the CWC bear the burden of retroactive responsibility for destroying chemical weapons left on the territory of another state, without its permission, dating back to 1925—some seventy-two years prior to the CWC Convention itself.

The CWC also establishes another retroactive date, pertaining to States Parties’ obligations to destroy not only chemical weapons but also their production and storage facilities remaining on the territory of another country: “Chemical weapons production facility means any equipment, as well as any building housing such equipment that was designed, constructed or used at any time since 1 January 1946.”⁵⁷

The clarity of CWC requirements, placing responsibility on states retroactively to decades before, was largely ignored by the U.S. When initial cleanup steps were taken, nearly a decade after the CWC was adopted, they were initiated not by the U.S. but by the Vietnamese government. Moreover, as noted earlier, the tardiness of cleanup activities funded by the U.S. was accompanied by treating the limited assistance it provided as a form of largesse or voluntary assistance to Vietnam, instead of as a reflection of the clear responsibility it bore under international law.

The notable limitations of the U.S. response, and the unusually casual manner in which it was handled, however, represent more than a thumbing of the nose at international law. With no systematic and thorough bilateral assessment of dioxin hotspots throughout Vietnam, it is

⁵⁵ Convention on Chemical Weapons, Article 1 (3).

⁵⁶ *Ibid*, Article 2 (6).

⁵⁷ *Ibid*, Article 2 (8).

possible that chemical exposures continue to threaten the health and well-being of civilians of that nation.

But the much larger continuing threat is that dioxin exposure due to widespread Agent Orange spraying—and so extensively over broad geographical swaths that hundreds of thousands and perhaps even millions of civilians were impacted—may still be impacting the gene pool of the Vietnamese people. The U.S. Congress itself gave a significant nod to the recognition of the threat of dioxin to human health when it established a program of funding and support for its own Vietnam War veterans who had been exposed to dioxin. The same, however, was never considered or done for Vietnamese families who continue to suffer from dioxin exposure.

In short, the United States has never acknowledged its responsibility for the continuing illnesses and deaths among Vietnamese civilians related to Agent Orange exposure, nor has it contemplated what, if any, responsibility it bears for reparations to its innocent victims.

5. THE U.S. AND CUSTOMARY WORLD STANDARDS

The international treaties and conventions we have considered, along with many others, are part of a broader but related legal framework that dates back several centuries. It is known as customary international law (CIL) and, although independent of treaty law, grew out of and is based on what states over time commonly accept as shared practices and obligations. Treaties and conventions typically pertain to specific expectations and rules of conduct governing issues such as the treatment of women, treatment of civilians in war time or of ethnic and religious minorities. Customary international law, on the other hand, is more comprehensive in nature. It grew out of the application of treaty law and encompasses practices that in some instances are considered preemptory international norms from which no state may derogate.

As a legally-established international framework, customary international law is recognized in the Charter of the United Nations, the Statute of the International Court of Justice (ICJ), and by nations and institutions worldwide.¹ Not only do both documents recognize customary law, they also recognize that upholding it is the key responsibility of the Court, the principal judicial organ of the United Nations—to “decide in accordance with international law [and] apply...international custom, as evidence of a general practice accepted as law.”² This general practice has two components: a general and consistent practice of states, and a sense of obligation that they are bound to the law in question, or *opinio juris*.³ A practice, therefore, does not become a rule of customary law “merely because it is widely followed; it must, in addition,

¹ The Statute of the International Court of Justice acknowledges customary international law in Article 38(1)(b), and it is also incorporated into Article 92 of the United Nations Charter.

² The Statute of the International Court of Justice, Article 38(1)(b).

³ Thomas Buergenthal and Sean D. Murphy, *Public International Law in a Nutshell, 5th edition*, (St. Paul: West Academic Publishing, 2013), p. 28; Yoram Dinstein, *The Conduct of Hostilities Under the Law of International Armed Conflict*, (Cambridge: Cambridge University Press, 2004), p. 5.

be deemed by states to be obligatory as a matter of law.”⁴ As such, a rule or principle “reflected in the practice or conduct of states must be accepted by states expressly or tacitly, as being legally binding on the international plane.”⁵

If instead the practice is followed out of courtesy, or if states believe that they are legally free to depart from it at any time, CIL will not be upheld.”⁶ At the same time, many jurists and legal scholars hold that a particular practice “does not have to be universally followed, but must nevertheless have obtained widespread acceptance” to be considered customary international law.⁷

Even further, some legal scholars hold that CIL is distinguished from treaty law in that it is “pervasive enough internationally that countries need not consent to be bound [by it].”⁸ Whereas treaty law is binding only to States Parties, “once a norm is established as customary international law it is binding on all states...”⁹ and can be used to fill in gaps or complement treaty law.¹⁰ In this sense, CIL “expands the reach of the rules to states that have not yet ratified [a] treaty”,¹¹ and thus can possess “more jurisprudential power than treaty law.”¹² This is illustrated by the principle that “the customary international law status of the rules can apply to actions of treaty parties that pre-dated the entry into force of the treaty.” (emphasis added).¹³

⁴ Buergenthal and Murphy, p. 28.

⁵ Ibid, p. 27.

⁶ Ibid, p. 28.

⁷ Susan Notar, “General Principles of International Law: Customary International Law,” *International Judicial Monitor*, 1, No. 5. (2006), accessed February 17, 2017, http://www.judicialmonitor.org/archive_1206/generalprinciples.html, p. 1.

⁸ Shabtai Rosenne, *Practice and Methods of International Law*, (New York: Oceana Publications Inc., 1984), p. 55; International Court of Justice, *United Kingdom v. Norway*, 1951.

⁹ Michael P. Scharf, “Accelerated Formation of Customary International Law,” *Case Western Reserve University School of Law, Faculty Publications* (2014), p. 309.

¹⁰ “Customary International Humanitarian Law,” *International Committee of the Red Cross*, <https://www.icrc.org/en/document/customary-international-humanitarian-law-0>, p. 1.

¹¹ Scharf, “Accelerated Formation,” p. 309.

¹² Ibid, p. 309.

¹³ Ibid, 309.

The above notwithstanding, it often is difficult to determine when state practice meets the threshold of customary international law.¹⁴ If a treaty provision or practice has been followed on a widespread basis, and out of a sense of obligation on the part of states, it nevertheless remains “difficult to discern how widely-accepted a practice must be to meet the test.”¹⁵

Customary law has been recognized as a concept central to jurisprudence dating back to the mid-seventeenth century. While international law often is considered to have emerged in Europe after the Peace of Westphalia in 1648, evidence indicates that the practice of customary law was not unique to Europe, but instead shared by many cultures—the Near East, Greece, Rome, China, Islam, and “Western Christendom”—whose coexistence largely depended upon the establishment of shared rules and norms in peace and in war.¹⁶ States entered into and practiced tacit consent which was “not attached to a contractual view but to tradition, something very similar to the present view of custom.”¹⁷ In the Middle Ages custom was typically “not a defined thing, but rather...an indeterminate set of possible conforming behaviors.”¹⁸ But ambiguity about the threshold of time required in order for a practice to be considered customary has generated debate among jurists which continues today.

As the practice of customary law developed over time, its definition and application grew more tangible and was reflected in law codified after the World War II. A dominant formulation of CIL appears in the Statute of the International Court of Justice. This formal recognition of customary law was emblematic of other changes of the time, including an increase in the number

¹⁴ Farhad Talaie, “The Importance of Custom and the Process of Formation in Modern International Law,” *James Cook University Law Review* (1998), p. 35.

¹⁵ Buergethal and Murphy, p. 28.

¹⁶ Majid Khadduri, as quoted in Peter Malanczuk’s *Modern Introduction to International Law*, 7th edition (New York: Routledge, 1997), p. 9.

¹⁷ Andre da Rocha Ferreira et al. “Formation and Evidence of Customary International Law,” *International Law Commission, Model United Nations Journal*, 1 (2013), p. 183.

¹⁸ *Ibid*, p. 183.

of international conventions and treaties.

Over the past hundred years or so, three instruments have played a particularly strong role in the development of customary international law—The Hague Conventions, The Treaty of Versailles, and the Geneva Conventions—because of their treatment of armed conflict and because of their contributions to the evolution of both customary and treaty law. They also exemplify two of the primary elements of modern international law, namely the rules of conduct during armed conflict, and protections for civilians. The former is often referred to as “Hague law” and the latter as “Geneva law”, reflecting their geographic origins.

The Hague Conventions of 1899 and 1907 govern the use of weapons against civilian populations, prohibit the employment of arms which can cause superfluous injury, and prohibit attacks on villages that are not defended. They also require the “authority of the legitimate power having actually passed into the hands of the occupant”¹⁹ to take all steps to re-establish and ensure public order and safety. Notably, they also prohibit the suffering or deaths of civilians, and introduce two notable requirements: the obligation of belligerent parties to be responsible for acts committed by persons in its armed forces, and for the party to pay compensation for any violation of the Conventions’ provisions.

The relevance and importance of The Hague Conventions regarding the laws of war was noted during the Nuremberg Tribunals, namely that “the provisions of the two Conventions on land warfare, like most of the substantive provisions of The Hague Conventions of 1899 and 1907, are considered as embodying rules of customary international law. As such, they are also

¹⁹ Convention with Respect to the Laws and Customs of War on Land (Hague, II), July 29, 1899, Section III, Article 43. Yale Law School. http://avalon.law.yale.edu/19th_century/hague02.asp, p. 7.

binding on states which are not formally parties to them.”²⁰ The rules of the Conventions “undoubtedly represented an advance over existing international law at the time of their adoption” and, as early as 1939, they had become “recognized by all civilized nations...as being declaratory of the laws and customs of war.”²¹

The Treaty of Versailles in 1919 concluded World War I by instituting an accord between Germany and the Allied Powers that established guidelines for continued peace. It required Germany to disarm and also to make concessions and pay reparations to certain states. Articles 231 and 232 required Germany to “accept the responsibility of [her] and her allies for causing the loss and damage to which the Allied and Associated Governments and their nationals have been subjected...,”²² while the latter required Germany to “make compensation for all damage done to the civilian population of the Allied and Associated Powers and to their property during the period of the belligerency [including] aggression by land, by sea and from the air...”²³ In addition to compensatory measures, Germany was also required “to make reimbursement of all sums,”²⁴ as determined by the Reparation Commission.

It is notable that many legal analysts and human rights observers now consider the Treaty to have been an overly-punitive instrument and one that likely led Germany to WWII. At minimum the post-war reparations imposed on Germany are no longer the types of reparations typically imposed under current international law. While analysts differ regarding the importance of the Treaty to the topic of reparations, it is included herein because of its historic importance and because it is a major thread in the development of the concept and practice of reparations

²⁰ Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land, The Hague, October 18, 1907, *International Committee of the Red Cross*, <https://ihl-databases.icrc.org/ihl/INTRO/195>, p. 1.

²¹ *Ibid*, p. 1.

²² *Ibid*, Article 231 and 232.

²³ *Ibid*, Article 232.

²⁴ Treaty of Versailles, Article 232.

within the international community.

The Geneva Conventions of 1949 came in the aftermath of WWII as an initial step towards mitigating the barbarity of war and establishing stronger civilian protections during armed conflict. The Conventions, themselves, derived from a diplomatic conference held in Geneva to discuss international humanitarian law in the wake of the WW II. Convention IV states that civilians shall be treated humanely and protected against threats and acts of violence, and it places responsibility on respective warring parties for said treatment. It also prohibits States Parties from taking any measure which could cause the suffering or deaths of protected persons such as civilians. Additional Protocol I offers similar protections for civilians, altogether prohibiting indiscriminate attacks as defined within, and requiring parties to the conflict to “avoid locating military objectives near or within densely populated areas.”

The historical contributions of these agreements to the development of customary international law stand alongside numerous others governing the norms of states. Appendix B provides a listing of many of them. In some instances, embodied in the concept of *jus cogens*, customary international law requires states to operate in accordance with global norms that may exist independent of individual treaties. With respect to torture, genocide and slavery, for example, states may not derogate, and neither can they legally hold that shortcomings of treaties absolve them of adherence to these global standards of customary law.²⁵

While such *jus cogens* norms do not cover obligations for post-war cleanup and reparations for civilians harmed or killed by ordnance and chemical weapons, we can consider whether the U.S. failed to follow customary world standards by using weapons such as cluster bombs and Agent Orange, particularly against civilian populations.

²⁵ “Customary International Law,” *International Judicial Monitor* 1, no. 5 (2006).
http://www.judicialmonitor.org/archive_1206/generalprinciples.html, p. 1.

While some might argue that the War is long over and the types of weapons used at the time are now irrelevant, such an argument would have to overcome a triple hurdle: 1) If weapons used were illegal under customary law at the time of the War, their deployment would have been in violation of customary international law irrespective of the passage of time; 2) If weapons were used against civilian populations, their deployment would have been in violation of both treaty and customary international law; and 3) If U.S. weapons continue to maim and kill Vietnamese civilians even today, the argument of their irrelevance due to the passage of time is turned on its head, rendering the U.S. *currently* in violation of customary international law because its weapons continue to kill.

At the outset of these considerations, it is important to acknowledge that the United States itself recognizes the concept and application of customary international law. Among many assents to CIL, the U.S. signed the Vienna Convention on the Law of Treaties, noting that it “considers many provisions of the Convention to constitute customary international law on the law of treaties”, and recognizes it as binding.²⁶ Moreover, in both diplomatic writings and international forums the United States has consistently referenced customary law as an existing and binding concept of internal jurisprudence.

The international community has condemned the use of chemical weapons for nearly a hundred years, and continues to do so even today as we have seen in their use by the Assad Regime in Syria. The 1924 Geneva Protocol, as we have seen, held that chemical weapons are never to be used “under any circumstances.”

This general prohibition, now widely accepted as a shared international norm, is now woven into more recent treaty law, notably in the Chemical Weapons Convention discussed in

²⁶ Vienna Convention on the Law of Treaties. *United States Department of State*. <https://www.state.gov/s/l/treaty/faqs/70139.htm>, p.1.

the previous chapter. Moreover, two resolutions passed by the United Nations General Assembly also elucidate the relevance of CIL in the matter of U.S. responsibility. In 1966, without any dissent, the General Assembly passed Resolution 2162B, which called for all states to observe the 1925 Geneva Protocol calling for the prohibition of the use of poisonous gases.²⁷ Three years later the General Assembly passed another resolution declaring that the prohibition on use of chemical and biological weapons in international armed conflicts, as embodied in the Protocol are “generally recognized rules of international law.”²⁸ This prohibition is now “widely accepted [and] considered to be customary international law, binding on all states, whether they have joined the Protocol or not.”²⁹

As for the use of explosive devices in Vietnam, particularly cluster bombs, it is less clear that customary international law prohibited their use. It is the nature of war, after all, that a variety of explosive devices typically are used by combatants against one another. Cluster bombs, however, have been singled out as particularly reprehensible because of their ability to kill or maim many people at a time, including innocent civilians. The world community, in large part, took a step toward outlawing cluster bombs as an international norm through the adoption of the Convention on Cluster Munitions, even though the U.S. refused to sign it. Clearly one convention alone, particularly a relatively recent one, does not transform a standard into customary law.

The question remains, however, whether the U.S. or any other nation may feel free to ignore *developing* customary international law. If, for example, the prohibition against cluster

²⁷ The 1925 Geneva Protocol is also referred to by its full name, the 1925 Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare.

²⁸ Richard A. Falk, *The Vietnam War and International Law Volume 4: The Concluding Phase*. (Princeton: Princeton University Press, 1976), p. 201.

²⁹ Angela Woodward, “The 1925 Geneva Protocol Goes Digital,” *VERTIC Blog*, May 17, 2012, <http://www.vertic.org/pages/posts/the-1925-geneva-protocol-goes-digital-298.php>, p. 1.

bombs is now accepted by a majority of states worldwide, a prohibition which the U.S. itself now accepts in most instances, what then can be the justification for leaving bombs on the soil of Vietnam to kill people even today? Is the apparent double standard of professing to accept the prohibition on cluster bombs while leaving the same bombs active on the soil of another country somehow justified under treaty law or international law? We shall re-visit this issue subsequently.

We come next to consideration of customary law regarding the use of weapons of war against civilian populations. The weight of the evidence solidly suggests that it is prohibited for any nation to knowingly wage war against civilians, particularly in the form of injuries and deaths. The Hague Conventions of 1899 and 1907 addressed the conduct of war including the protection of civilians, standards so clear and transformative that they later were incorporated into the military codes of various nations including the U.S. Similarly, Hague II further prohibits the wounding or killing of civilians, including military attacks against undefended villages. Also, the Geneva Conventions of 1949 sought to mitigate the barbarity of war by establishing protections for civilians from the threat or actual experience of war-related violence. Convention provisions include prohibiting indiscriminate attacks and avoiding military objectives from being carried out near or within densely populated areas.

With the above conventions setting out both widely-held obligations and long-accepted international practices to protect civilians during times of war, and with yet other more recent conventions and international discourse among nations reflecting the same standards, it can hardly be denied that the practice of not harming civilian populations during war time is part of customary international law. It is in this context that U.S. actions in Vietnam can be evaluated. Were civilians impacted? If so, how? And was the impact accidental or minimal, or on a more

sustained and broad-scale basis?

That many Vietnamese civilians were killed and maimed during the War is uncontested. While estimates of the number vary, as indicated by sources cited in Chapters 2 and 3, U.S. military records, Vietnamese government records, and those of international sources place the numbers in the hundreds of thousands if not millions. One authoritative example of the far-reaching nature of the impact on civilians was the Stellman Report, based on research conducted by Professor Jeanne Stellman of Columbia University. In both her research and Congressional testimony, she reported that the number of “silent” victims of the War due to Agent Orange exposure alone was 4,800,000, and that this number does not even include the millions poisoned later due to the introduction of dioxin into the food chain.³⁰

When this impact is combined with the number of civilians maimed or killed by U.S. cluster bombs—both during the War and even today—little question exists but that U.S. military operations violated standards of customary international law. That the impact on civilians was not simply incidental or mistaken is reflected not only in the numbers impacted but also in the widespread use of cluster bombs and Agent Orange by the U.S. Some 43% of cultivated land was poisoned; 60% of many plantations; and 36% of key forest lands. More than 6,000 square kilometers of land in southern Vietnam alone remain unsuitable for agriculture, and their water sources were polluted on a massive scale.³¹

In light of U.S. use of weapons prohibited under both treaty law and customary international law, and particularly in light of their use against innocent civilians on a widespread and sustained basis, what obligations does customary law place on the U.S. with respect to post-

³⁰ Jeanne Stellman et al, “The Extent and Patterns of Usage of Agent Orange and Other Herbicides in Vietnam.” *Nature* 422 (April 17, 2003), p. 685.

³¹ “Public Appeal of International Lawyers Concerning the Responsibility of the United States Toward Vietnam for the Sprayings of Agent Orange/Dioxin,” Press release of Initial Endorsers, April 29, 2007, p. 2.

war cleanup? More broadly framed, what responsibilities do combatant countries have for removing or destroying weapons left on the land of other states, particularly when they constitute an ongoing threat to civilian populations?

Little question exists but that post-war cleanup is required as a matter of customary international law, particularly given the development of treaty law over decades. Moreover, recent treaties, notable for their relationship to developing standards of customary law, consistently highlight the responsibility of warring parties to clean up the weapons they leave behind.³² Cleanup responsibility also has been consistently highlighted in yet other forums, such as the United Nations Human Rights Committee and the European Court on Human Rights. Moreover, responsibility for post-war cleanup has, as a matter of record, never been contested by the United States. In fact, in signing the 1973 Paris Peace Accords ending its involvement in Vietnam, the United States declared that it will “contribute to erase the wounds of the War and to the post-war reconstruction of the Democratic Republic of Vietnam.”³³ It would be virtually inconceivable to suggest that this commitment, particularly in light of existing treaty laws even at the time, would not cover removal of live ordnance and dioxin.

With responsibility for cleanup ignored for decades by the United States, and in light of its significantly limited and highly tardy response in addressing Agent Orange exposure in Vietnam, a final consideration under customary international law concerns U.S. responsibility for reparations to innocent civilian victims.

Reparations are an established practice to acknowledge the legal obligation of a state or entity to “repair the consequence of violations, either because it directly committed them or it

³² Cleanup requirements exist in each of the following conventions: Convention on Environmental Modification (1977); Convention on Chemical Weapons (1977); Convention on Certain Conventional Weapons (2006); and Convention on Cluster Munitions (2010).

³³ Paris Peace Accords, Article 21, 1973.

failed to prevent them.”³⁴ As such, reparations are considered by some to be “the most direct and meaningful way of receiving justice.”³⁵ The practice is recognized in both treaty law and customary international law, and is a common practice of states worldwide to make amends for wrongdoing.

The right to reparations as well as the duty to provide them is a principle of law that has existed for centuries.³⁶ It is recognized and secured by the United Nations,³⁷ in myriad human rights and humanitarian treaties,³⁸ in legal instruments,³⁹ and also in customary international law. It is a principle of customary law that “the breach of an engagement involves an obligation to make reparations in an adequate form”⁴⁰, and as such, reparations “must, as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed.”⁴¹

As a responsibility relating to armed conflict, reparations were awarded through the Treaty of Versailles in the aftermath of WW I. The Treaty declared Germany liable for reparations to the Allied forces as well as for civilian damage caused during the War. Since then, the “international concern for civilians harmed by armed conflict has increased substantially,”⁴²

³⁴ “Reparations,” The International Center for Transitional Justice. <https://www.ictj.org/our-work/transitional-justice-issues/reparations>, p. 1.

³⁵ Ibid, p. 1.

³⁶ “What is Reparation?” REDRESS. www.redress.org/what-is-reparation/what-is-reparation, p. 1.

³⁷ “Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law,” *United Nations Human Rights Office of the High Commissioner*, www.ohchr.org/en/professionalinterest/pages/remedyandrepairation.aspx, p. 1.

³⁸ Including the International Covenant on Civil and Political Rights (Article 2); the International Convention on the Elimination of All Forms of Racial Discrimination (Article 6); the Convention Against Torture (Article 140); the Convention on the Rights of the Child (Article 39).

³⁹ Including resolutions and guidelines adopted by the U.S. General Assembly; The Hague Convention IV Respecting the Laws and Customs of War on Land (Article 3); the Universal Declaration of Human Rights (Article 8); the Geneva Conventions Additional Protocol I Relating to the Protection of Victims of International Armed Conflicts (Article 91); the Rome Statute of the International Criminal Court (Articles 75 and 78).

⁴⁰ Permanent Court of Arbitration, Chorzow Factory Case (Ger. V. Pol.), PCIJ, Sr. A. No. at 29.

⁴¹ Ibid.

⁴² Andrew Childers and Anna Lamut, “Legal Foundations for ‘Making Amends’ to Civilians Harmed by Armed Conflict.” *Harvard Law School International Human Rights Clinic* (2012), p. 2.

with the psychosocial impacts of WW II elucidating the magnitude of violence and also the widespread harm to civilian victims.

The practice of reparations now extends beyond war damages alone, to include compensatory and other measures for individuals and groups for severe human rights violations.⁴³ While “most of the international legal developments dealing with civilian harm have focused on unlawful activities by warring parties, there are, however, legal precepts and increasing state practices that support the development of a comprehensive framework for assisting civilians harmed by lawful as well as unlawful conduct during armed conflict.”⁴⁴ International law now recognizes several forms of reparations including restitution, compensation and rehabilitation and the guarantee of non-repetition.⁴⁵

The state is the first line of defense in human rights law, with the obligation to respect, protect, and fulfill rights⁴⁶ and, therefore, a state “responsible for violations of international humanitarian law is required to make full reparation for the loss or injury caused.”⁴⁷ So preeminent is this notion that it is considered as “a norm of customary international law applicable in both international and non-international armed conflicts.”⁴⁸

This norm was manifest in the 1928 ruling of the Chorzow Factory case made by the Permanent Court of International Justice – now the International Court of Justice – which stated that “it is a principle of international law, and even a general conception of the law, that any breach of an engagement involves an obligation to make reparation...and *there is no necessity*

⁴³ Pablo De Greiff, *The Handbook of Reparations*, (Oxford: Oxford University Press, 2006).

⁴⁴ Childers and Lamut, p. 2.

⁴⁵ REDRESS, p. 2; *United Nations Human Rights Office of the High Commissioner* p. 5.

⁴⁶ The notion of respecting, protecting and fulfilling rights is also referred to as “realizing rights.” Respect (refrain from interfering with established rights); protect (prevent against abuses by non-state actors), and fulfill (actively safeguard and enforce rights).

⁴⁷ “Customary IHL: Role 150. Reparation,” *International Committee of the Red Cross*, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule150.

⁴⁸ “Customary IHL: Role 150. Reparation,” *International Committee of the Red Cross*.

for this to be stated in the convention itself,”⁴⁹ (emphasis added). This ruling indicates that in addition to being secured in treaty law, reparations also are recognized as a normative measure – in other words an accepted and essential component of customary international law.

The actual practice of reparations did not begin with the Treaty of Versailles, nor did it end there. The call for reparations include the descendants of individuals enslaved during the Atlantic Slave Trade, through the African Repatriation Truth Commission; reparations for aboriginal Canadian families placed in church-run schools in an effort to homogenize Canada; and reparations for families of the disappeared in Chile under the regime of Agosto Pinochet, in which families were awarded monthly pensions, access to a specialized health care program, exemption from military service, and educational benefits for children.⁵⁰

The right to reparations is also recognized and practiced by the United States. Forty years after the internment of 60,000 Japanese-Americans during WWII, for example, the U.S. government provided reparations for survivors including an apology, establishment of a trust fund, and the provision of direct monetary payments.⁵¹ The U.S. later provided reparations to Afghani civilians under the Afghan Civilian Assistance Program for those “negatively impacted by the presence of the international military.”⁵² In 2003, the U.S. also provided reparations through the Iraqi War Victims Fund to families who “suffered losses as a result of U.S. military

⁴⁹ Chorzow Factory Case (cited in The Law I, § 73). See also PCIJ Statute, Article 36, which states that “the States Parties to the present Statute may at any time declare that they recognize as compulsory *ipso facto* and without special agreement, in relation to any other state accepting the same obligation, the jurisdiction of the Court in all legal disputes concerning: ... (d) the nature or extent of the reparation to be made for the breach of an international obligation.” Article 36 of the ICJ Statute contains similar wording.

⁵⁰ The Islah Reparations Project lists additional examples of reparations initiatives, <http://www.reparations.org/why-reparations/history-of-reparations>, p. 1 -3. (See also REDRESS <http://www.redress.org/key-cases/key-cases>, and the International Center for Transitional Justice <https://www.ictj.org/our-work/transitional-justice-issues/reparations>. p. 3 - 4.)

⁵¹ Childers and Lamut, p. 3.

⁵² Ibid, p. 7.

operations.”⁵³ The United States also paid reparations to Switzerland “for the accidental bombing of the town of Schaffhausen during World War II”, and in the 1950s it paid financial compensation to Japan after conducting an atomic bomb test in the Pacific “which showered a Japanese fishing boat and its crew with radiation.”⁵⁴

Given this history the United States is familiar with the principle and practice of reparations. After some years of averring responsibility for compensation to its own Vietnam veterans, the U.S. changed its policy due to Congressional pressure and now provides compensation to military personnel who had been exposed to Agent Orange.⁵⁵ In terms of reparations for the ongoing harm inflicted upon Vietnamese civilians, however, no reparations have been offered or provided by the United States.

It would be most difficult to establish a sustainable legal principle that justifies the U.S. government’s decision to provide compensation to its own veterans while never compensating – let alone recognizing – the impact of the same harm to innocent Vietnamese civilians. While the Geneva Conventions of 1949 did distinguish between obligations to one’s own civilians and obligations to the enemy, obligations to both are noted. But in the current context Vietnamese civilians are not the enemy but civilians, and arguably no different than the Afghani or Iraqi civilians to whom the U.S. has provided reparations for damages from its military operations in 2003. Moreover, the principle of reparations suggests that a state is responsible for providing reparations to all of the victims of its transgressions who have suffered in a similar manner.

⁵³ Ibid, p. 7.

⁵⁴ Legal definition of reparation: <http://legal-dictionary.thefreedictionary.com/reparation>.

⁵⁵ The first class-action lawsuit filed by a U.S. veteran about the damages caused by Agent Orange occurred in 1978. Paul Reutershan, a twenty-eight year old veteran, believed that his chloracne and abdominal cancer were related to exposure to Agent Orange. He sued chemical manufacturers including Dow and Monsanto, and in 1978 (after Reutershan’s death), monetary compensation of \$330 million (\$150 million more than the original \$180 million due to invested assets) was distributed to Class members. (See Agent Orange Record: http://www.agentorangerecord.com/information/the_quest_for_additional_relief/.)

To summarize, reparations are an established principal of customary international law, and the responsibility is of such standing that no need exists even to note it in individual conventions.⁵⁶ It would therefore be in accordance with international standards for the United States to provide reparations to Vietnamese civilians for the ongoing harm caused by excessive exposure to Agent Orange as well as the continuing explosions of left-behind ordnance.

* * *

With the government of the United States largely silent regarding its post-war responsibilities, it is difficult to discern whether this long silence is simply a strategic avoidance of the issues or if some rationale supports its inaction. It is possible that the U.S. might advance two legal arguments to seek to justify the failure to act. One is that relevant treaties governing weapons of war and the targeting of civilians did not exist at the time of the Vietnam War, and the other is that international obligations governing post-war cleanup and reparations are not retroactive in nature and, thus, place no burden on the U.S. to act.

Both arguments fail to withstand scrutiny. Long before the United States entered Vietnam both treaty law and customary international law banned the use of chemical weapons as acceptable agents in times of armed conflict. Moreover, the ban against targeting innocent civilians had long been established as an international standard, one clearly existing at the time Vietnamese civilians were being targeted on a sustained basis through U.S. deployment of explosive and chemical weapons. The weight of international law, in both relevant treaties and customary law, does not permit the United States to hold that it somehow made its departure from Vietnam just in time to obviate legal responsibility for the types of weapons it used, or for

⁵⁶ Chorzow Factory Case.

using them against civilian populations.

Post-war obligations for cleanup extend back to the Geneva Protocol of 1925, even to the obligation of states to destroy their abandoned weapons of war. In addition, the more recent Chemical Weapons Convention itself places the burden on states for cleanup retroactive to 1946. Moreover, extant treaty law also places responsibility for cleanup on states even if weapons were left behind predating the relevant legal instrument, a requirement pertaining not only to chemical weapons but to explosive ordnance as well.⁵⁷

It also is an unassailable position to hold that cleanup is a necessary component of any weapons ban. For states to be held accountable for abolishing remaining weapons post-war, but to then be permitted to let them remain, would undermine the very purpose of cleanup. The fundamental reason for post-war cleanup, after all, is to protect civilians who may be harmed or even killed by them after hostilities have ended. The logic of this is rendered even more poignant when weapons such as cluster bombs and other war weapons continue to kill civilians after formal hostilities end.

Finally, let us re-visit the argument for reparations to or for Vietnamese civilians maimed or killed by the U.S. While the U.S. has ignored the subject altogether, it could not sustain an argument for exemption from such responsibility on the basis of timing or retroactivity. The concept and practice of reparations arose long before its entry into Vietnam, and reparations are, by their very nature, *ex post facto*.

Based on consideration of both treaty law and customary international law, the overwhelming evidence is that the United States violated international laws of war by the types of weapons it deployed in Vietnam and by their indiscriminate use against civilians. And in the

⁵⁷ Bonnie Docherty, "Breaking New Ground: The Convention on Cluster Munitions and the Evolution of International Humanitarian Law," *Human Rights Quarterly* 31, no. 4 (2009), p. 935.

forty years following the end of the War, the U.S. has violated all obligations to remove its live weapons from Vietnamese soil, or to even consider reparations responsibilities to Vietnamese families for those maimed and killed by its actions both during and after the War.

* * *

“By the mere fact of having sent [its planes to] a foreign country in violation of its territorial integrity, and in doing so having caused damage and destruction contrary to Humanitarian Law, whatever the modus operandi, constitutes an illegal act by which the United States has made itself responsible for the consequences and is obligated to rectify them.”

Public Appeal of International Lawyers Concerning the Responsibility of the United States toward Vietnam,
Francis Boyle, et. al., April 29, 2007

6. RULE OF LAW OR SCOFFLAW

*There will be justice in Athens when those who are not injured
are as outraged as those who are. – Thucydides*

It is now more than four decades since the end of the Vietnam War, soon approaching fifty years since the last American troops departed that small Southeast Asian nation. Official counts indicate that during the years of U.S. involvement the conflict resulted in the deaths of 724,000 American and Vietnamese troops, and some 400,000 civilian victims. But the War has yet to end for Vietnamese families. The intervening decades have been marked by the injuries and deaths of at least 100,000 more Vietnamese children and adults from explosive ordnance left behind by U.S. troops. However, this is but one toll. America's widespread spraying of poisonous defoliants on farms, rice paddies, and villages constitutes another component of the "continuing war", particularly for subsequent generations of Vietnamese children.

It is perhaps difficult to fathom how a war, once ended, can continue on with grievous harm to civilians long after armed conflict is over. We might even ask how a war can be considered over when the deaths of innocents continue for decades. Generations back states had few perceived remedies by which to address the continuing costs of war, particularly for civilians, nor did they readily have meaningful avenues by which to assess and assign responsibility for the ongoing harm that resulted. Even well into the twentieth century the world had few meaningful ways to address the debilitating impact of war's aftermath.

The situation is not the same today. The world is no longer so lacking in wherewithal or a meaningful legal framework by which to evaluate and respond to continuing post-war traumas. States now have what previous generations did not have available – a robust body of international law that governs the types of weapons used by combatants, the responsibilities

states have for post-war cleanup and reparations, and even the assignment of possible criminal responsibility to state and military leaders who fail to comply with world standards.

The international legal framework extends to each of these circumstances. No longer are violations of accepted standards of conduct simply the “tough luck” of civilians who suffer the life-threatening brunt of unacceptable behaviors. No longer are nations and citizens of the world left without a response other than the feeling of miserable helplessness. A more fully developed body of international law exists requiring states to adhere to shared standards of responsibility, and placing potential constraints, restrictions and rebuke on those that do not comply.

But if the body of international law the world now shares is to have meaningful significance in the relationships of states, and particularly in the provision of protections to safeguard the lives of citizens, states must honor not only the details of law but the general principles of developing humanitarian standards. This is particularly important for large and powerful nations such as the United States which claim world leadership, promote enlightened approaches to governance, and espouse adherence to the rule of law.

It is in this context that we now assess U.S. responsibility for the weapons of war it used and left in Vietnam nearly fifty years ago. What does international law require concerning the weapons used by the United States? What responsibility does the United States bear for cleaning up the weapons it left in Vietnam that continue to threaten the lives of women, men, and children? What does the weight of international law suggest regarding U.S. responsibility for the lives of the 100,000 Vietnamese civilians maimed or killed since American troops left the country, as well as generations of children deformed by DNA alterations passed down from their parents and grandparents who suffered Agent Orange exposure? And finally, what external pressures and entities can help to fortify the enforcement of international law?

Consideration of relevant international conventions in the foregoing chapters, nested within the framework of customary international law, support the conclusion that the United States:

- 1) Used military weapons in Vietnam that had been outlawed decades earlier, particularly the use of poisonous chemical agents,
- 2) Employed weapons in Vietnam, including cluster bombs and Agent Orange, that are clearly illegal under existing international standards,
- 3) Used both chemicals and cluster bombs on a widespread basis against innocent civilians,
- 4) Has never officially acknowledged that its weapons are still maiming and killing Vietnamese and, thus, that its war-related hostilities continue even today,
- 5) Has failed altogether to accept or even discuss responsibility for cleanup of the unexploded ordnance it left on Vietnamese soil, and
- 6) Has never addressed or even considered any responsibility for reparations to Vietnamese civilians killed by left-behind live ordnance or poisoned by Agent Orange, even though it has acknowledged the impact of this poisonous chemical on its own troops through stipends now awarded to U.S. veterans.

Given the relevance of current international law to the role of the U.S. during the Vietnam War, how can U.S. failure to acknowledge, let alone meaningfully consider, responsibility under relevant conventions and treaties be understood? Perhaps the only way to truly understand U.S. failure to address post-war responsibility is to conclude that the United States considers international law more an elective than an obligation. The American government, like some other nations, not infrequently has viewed treaty provisions to which it is

bound less as mandatory legal obligations and more as expectations from which it is free to exempt itself. On some occasions it has refused even the expansion of international law. Today, for example, the United States has not agreed to the complete ban of cluster bombs. Along with Russia, Pakistan, China, and Israel, the U.S. has refused to join the 100+ nations who now hold cluster bombing to be an inhumane and unacceptable practice. Because the American government exempts itself from this generally-accepted international standard, does it mean that it is legally exempt and thus has an absolute right to employ cluster bombs against other nations? Does it mean that the U.S. is permitted to disregard international standards when it simply elects to do so? And if the answer to either or both questions is in the affirmative, what does this suggest about America's claim to world leadership and its avowed respect for the rule of law?

By awarding itself special privilege, the U.S. enjoys the luxury of benefitting from conflicting options: seeking acceptance and recognition as a world leader among the international community, while reserving for itself the wiggle-room to ignore established legal norms when deemed convenient. By failing to recognize and comply with some treaties, by circumscribing key elements of treaties it does recognize, and by quibbling over the interpretative language of still others, the U.S. government often undermines its standing as a strong world leader. With respect to its responsibilities to Vietnam, the inaction of the U.S. indicates that it does not always take seriously its international treaty obligations and the developing norms of customary law.

Perhaps the U.S. has refused to carry out its legal responsibilities to Vietnam because it could hardly sustain an argument that it is unaware of the ordnance and chemicals it left behind. Likewise, neither could the U.S. claim that it is unaware of the continuing deaths it is still causing among the civilian population of Vietnam. Because this knowledge is part of the

international public record, such arguments would be considered fanciful at best. Neither could the U.S. sustain a logical argument that it lacks responsibility due to the thin thread of timing, namely that some relevant treaties which apply now were not in force at the time of the War. Such a position would be a fool's errand since America's unexploded weapons are still at work today, making any and all of these existing treaty provisions relevant today, irrespective of their dates of adoption. Whatever weapons and uses may not have been illegal under international law at the time of the Vietnam War are illegal now, because the U.S. is allowing them to kill Vietnamese people today.

The weight of the evidence—the array of multiple conventions established and employed over decades, the practices of relevant state and international institutions, and the practice of customary international law—suggests that regardless of any ambiguity in particular treaty provisions, it is in both the spirit and trajectory of developing international law for the U.S. to facilitate the removal and destruction of explosive remnants of war in Vietnam, to make the country and its people safe from dioxin poisoning related to Agent Orange, and to provide appropriate reparations for victims and families harmed inter-generationally by the U.S. spraying of poisonous chemicals on their forests, fields and rivers.

Having no logical or meaningful reprieve from responsibility under international law, the United States appears to have several options. First, the U.S. could simply continue to ignore its responsibilities regarding Vietnam. Such inaction—a let-sleeping-dogs-lie approach—would seemingly free the U.S. from addressing such thorny issues and possibly bring it financial benefits by ignoring them altogether. On the other hand, continued U.S. silence could also weaken the efficacy of international law, undermine U.S. claims to world leadership with respect to human rights, and almost certainly lead to the continued maiming and killing of Vietnamese

innocents.

A second option would be for the U.S. to formally acknowledge the compelling issues of explosive ordnance and Agent Orange exposure, including the obligation to initiate cleanup and reparations, by working with the Vietnamese government to remove and destroy ordnance and by proposing further Congressional funding for cleanup of all toxic hotspots. This would mean, of course, that the American government would have to discontinue the position that it owes compensation to its own veterans for exposing them to Agent Orange while ignoring any responsibility for innocent Vietnamese people who it poisoned.

A third option would be for relevant Congressional committees to hold hearings to better understand the nature and dimensions of the problem of left-behind ordnance, to help educate the public about it as well, and to consider appropriate steps to take under international law. Such hearings could be conducted in one of two ways: an investigative matter to scrutinize responsibility of the U.S. government, or legislative hearings to formulate steps to fully exercise responsibility for cleanup and reparations.

Yet a final option is that the international community itself, possibly through the United Nations or even a quasi-independent, multilateral international body, could investigate U.S. conduct under existing law, and point to areas of responsibility that never have been recognized by the U.S.

As is evident with the case of the U.S. in Vietnam, increasing state compliance with obligations under international law requires much more than the goodwill and the legal commitments of states. Pressure from the international community by way of global institutions, non-governmental organizations and other nations, in combination, are required to advance compliance. The international community must apply the same bold integrity to compel

compliance with obligations of post-war cleanup and reparations as is applied to other laws of war.

* * *

Formal United States participation in the Vietnam War ended when its troops departed the country in the early 1970s, but the War has yet to end. Deaths continue to accrue from ordnance explosions and from congenital diseases associated with Agent Orange exposure. They will continue to mount indefinitely unless the United States takes action through one of the abovementioned means.

Little else seems to exemplify the gravity of continued post-war suffering as much as the fact that it is not unique to Vietnam, but also impacts nations across the globe. Continuing post-war violence is not limited to any particular country or global region, but is an outcome experienced by many who have participated in war. According to the International Committee of the Red Cross, ordnance remain in other post-conflict regions including Bosnia and Herzegovina, Iraq, Rwanda, Nicaragua, and Sri Lanka, among others. If the United States were to take meaningful and appropriate steps in Vietnam it could open the door for the accountability of other states for removing explosive remnants of other wars. Yet much remains contingent upon the U.S. formally recognizing and accepting responsibility.

With respect to Vietnam, America has two options: to demonstrate respect for the rule of law, or to shirk it by remaining an international scofflaw.

Appendix A

Four International Conventions Covered in Chapters 2 and 3

1. CONVENTION ON THE PROHIBITION OF MILITARY OR ANY OTHER HOSTILE USE OF ENVIRONMENTAL MODIFICATION TECHNIQUES (ENMOD) (1977)

The following articles were selected by the author for bearing greatest relevance to post-war cleanup and reparations responsibilities.

Preamble:

Guided by the interest of consolidating peace, and wishing to contribute to the cause of halting the arms race, and of bringing about general and complete disarmament under strict and effective international control, and of saving mankind from the danger of using new means of warfare,

Determined to continue negotiations with a view to achieving effective progress toward further measures in the field of disarmament,

Recognizing, however, that military or any other hostile use of such techniques could have effects extremely harmful to human welfare,

Desiring to prohibit effectively military or any other hostile use of environmental modification techniques in order to eliminate the dangers to mankind from such use, and affirming their willingness to work towards the achievement of this objective,

Article 1 (1) - Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.

Article 2 - As used in article I, the term environmental modification techniques refers to any technique for changing - through the deliberate manipulation of natural processes - the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space.

Article 5 (5) - Each State Party to this Convention undertakes to provide or support assistance, in accordance with the provisions of the Charter of the United Nations, to any State Party which so requests, if the Security Council decides that such party has been harmed or is likely to be harmed as a result of violation of the Convention.

Understandings regarding the Convention - It is the understanding of the Committee that, for the purposes of this Convention, the terms "widespread", "long-lasting" and "severe" shall be interpreted as follows:

- a) *"widespread": encompassing an area on the scale of several hundred square kilometers*
- b) *"long-lasting": lasting for a period of months, or approximately a season*
- c) *"severe": involving serious or significant disruption or harm to human life, natural and economic resources or other assets.*

2. CONVENTION ON THE PROHIBITION OF THE DEVELOPMENT, PRODUCTION, STOCKPILING AND USE OF CHEMICAL WEAPONS AND ON THEIR DESTRUCTION (CWC) (1997)

The following articles were selected by the author for bearing greatest relevance to post-war cleanup and reparations responsibilities.

Article 1 (1) (c) - Each State Party to this Convention undertakes never under any circumstances to engage in any military preparations to use chemical weapons.

Article 1 (2) - Each State Party undertakes to destroy chemical weapons it owns or possesses, or that are located in any place under its jurisdiction or control, in accordance with the provisions of this Convention.

Article 1 (3) - Each State Party undertakes to destroy all chemical weapons it abandoned on the territory of another State Party, in accordance with the provisions of this Convention.

Article 1 (4) - Each State Party undertakes to destroy any chemical weapons production facilities it owns or possesses, or that are located in any place under its jurisdiction or control, in accordance with the provisions of this Convention.

Article 2 (1) (a) - "Chemical weapons" means toxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes

Article 2 (2) - "Toxic Chemical" means any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals. This includes all such chemicals, regardless of their origin or of their method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.

Article 2 (6) - "Abandoned Chemical Weapons" means chemical weapons, including old chemical weapons, abandoned by a State after 1 January 1925 on the territory of another State without the consent of the latter.

Article 2 (8) (a) - "Chemical Weapons Production Facility" means any equipment, as well as any building housing such equipment, that was designed, constructed or used at any time since 1 January 1946

Article 3 (1) (b) - With respect to old chemical weapons and abandoned chemical weapons:

(iii) Declare whether it has abandoned chemical weapons on the territory of other States and provide all available information in accordance with Part IV (B), paragraph 10, of the Verification Annex.

Article 3 (1) (c) (v) – With respect to chemical weapons production facilities: Provide its general plan for destruction of any chemical weapons production facility it owns or possesses, or that is located in any place under its jurisdiction or control, in accordance with Part V, paragraph 6, of the Verification Annex

Article 3 (1) (c) (vi) - With respect to chemical weapons production facilities: Specify actions to be taken for closure of any chemical weapons production facility it owns or possesses, or that is located in any place under its jurisdiction or control, in accordance with Part V, paragraph 1 (i), of the Verification Annex

Article 4 (6) - Each State Party shall destroy all chemical weapons specified in paragraph 1 pursuant to the Verification Annex and in accordance with the agreed rate and sequence of destruction (hereinafter referred to as "order of destruction"). Such destruction shall begin not later than two years after this Convention enters into force for it and shall finish not later than 10 years after entry into force of this Convention. A State Party is not precluded from destroying such chemical weapons at a faster rate.

Article 4 (7) - Each State Party shall:

(a) Submit detailed plans for the destruction of chemical weapons specified in paragraph 1 not later than 60 days before each annual destruction period begins, in accordance with Part IV (A), paragraph 29, of the Verification Annex; the detailed plans shall encompass all stocks to be destroyed during the next annual destruction period

(b) Submit declarations annually regarding the implementation of its plans for destruction of chemical weapons specified in paragraph 1, not later than 60 days after the end of each annual destruction period

(c) Certify, not later than 30 days after the destruction process has been completed, that all chemical weapons specified in paragraph 1 have been destroyed

Article 4 (11) - Any State Party which has on its territory chemical weapons that are owned or possessed by another State, or that are located in any place under the jurisdiction or control of another State, shall make the fullest efforts to ensure that these chemical weapons are removed from its territory not later than one year after this Convention enters into force for it. If they are not removed within one year, the State Party may request the Organization and other States Parties to provide assistance in the destruction of these chemical weapons.

Article 4 (12) - Each State Party undertakes to cooperate with other States Parties that request information or assistance on a bilateral basis or through the Technical Secretariat regarding methods and technologies for the safe and efficient destruction of chemical weapons.

Article 4 (16) - Each State Party shall meet the costs of destruction of chemical weapons it is obliged to destroy. It shall also meet the costs of verification of storage and destruction of these chemical weapons unless the Executive Council decides otherwise. If the Executive Council decides to limit verification measures of the Organization pursuant to paragraph 13, the costs of

complementary verification and monitoring by the Organization shall be paid in accordance with the United Nations scale of assessment, as specified in Article VIII, paragraph 7.

Article 10 (8) (a) - Each State Party has the right to request and, subject to the procedures set forth in paragraphs 9, 10 and 11, to receive assistance and protection against the use or threat of use of chemical weapons if it considers that chemical weapons have been used against it

3. CONVENTION ON CERTAIN CONVENTIONAL WEAPONS: PROTOCOL V ON EXPLOSIVE REMNANTS OF WAR (2006)

The following articles were selected by the author for bearing greatest relevance to post-war cleanup and reparations responsibilities.

[It is noted that] the High Contracting Parties, recognizing the serious post-conflict humanitarian problems caused by explosive remnants of war [and] conscious of the need to conclude a Protocol on post-conflict remedial measures of a generic nature in order to minimize the risks and effects of explosive remnants of war...have agreed as follows... ”

Article 1 (2) - This Protocol shall apply to explosive remnants of war on the land territory including internal waters of High Contracting Parties.

Article 2 (1) - Explosive ordnance means conventional munitions containing explosives, with the exception of mines, booby traps and other devices as defined in Protocol II of this Convention as amended on 3 May 1996.

Article 2 (2) - Unexploded ordnance means explosive ordnance that has been primed, fused, armed, or otherwise prepared for use and used in an armed conflict. It may have been fired, dropped, launched or projected and should have exploded but failed to do so.

Article 2 (5) - Existing explosive remnants of war means unexploded ordnance and abandoned explosive ordnance that existed prior to the entry into force of this Protocol for the [High Contracting Party on whose territory it exists].

Article 3 (1) - Each High Contracting Party and party to an armed conflict shall bear the responsibilities set out in this Article with respect to all explosive remnants of war in territory under its control. In cases where a user of explosive ordnance which has become explosive remnants of war, does not exercise control of the territory, the user shall, after the cessation of active hostilities, provide...inter alia technical, financial, material or human resources assistance...to facilitate the marking and clearance, removal or destruction of such explosive remnants of war. [Article 8(1) also obliges States Parties to “provide assistance for the marking and clearance, removal or destruction of explosive remnants of war.”]

Article 3 (4) - In conducting the above activities High Contracting Parties and parties to an armed conflict shall take into account international standards, including the International Mine Action Standards. [Article 7(2) also obliges States Parties to “take into account the humanitarian objectives of this Protocol, as well as international standards...”].

Article 4 (1) - High Contracting Parties and parties to an armed conflict shall to the maximum extent possible and as far as practicable record and retain information on the use of explosive ordnance or abandonment of explosive ordnance, to facilitate the rapid marking and clearance, removal or destruction of explosive remnants of war, risk education and the provision of relevant information to the party in control of the territory and to civilian populations in that territory.

Article 4 (2) - High Contracting Parties and parties to an armed conflict which have used or abandoned explosive ordnance which may have become explosive remnants of war shall, without delay after the cessation of active hostilities and as far as practicable, subject to these parties' legitimate security interests, make available such information to the party or parties in control of the affected area, bilaterally or through a mutually agreed third party including inter alia the United Nations or, upon request, to other relevant organizations which the party providing the information is satisfied are or will be undertaking risk education and the marking and clearance, removal or destruction of explosive remnants of war in the affected area.

Article 7 (1) - Each High Contracting Party has the right to seek and receive assistance, where appropriate, from other High Contracting Parties, from states non-party and relevant international organizations and institutions in dealing with the problems posed by existing explosive remnants of war.

4. CONVENTION ON CLUSTER MUNITIONS (2010)

The following articles were selected by the author for bearing greatest relevance to post-war cleanup and reparations responsibilities.

Article 2 (2) - Cluster munition means a conventional munition that is designed to disperse or release explosive sub-munitions each weighing less than 20 kilograms, and includes those explosive sub-munitions.

Article 4 (2) (d) – [Each State Party shall] ... clear and destroy all cluster munition remnants located in areas under its jurisdiction or control.

Article 4 (4) (a) - This paragraph shall apply in cases in which cluster munitions have been used or abandoned by one State Party prior to entry into force of this Convention for that State Party and have become cluster munition remnants that are now located in areas under the jurisdiction or control of another State Party at the time of entry into force of this Convention for the latter. In such cases, upon entry into force of this Convention for both States Parties, the former State Party is strongly encouraged to provide, inter alia, technical, financial, material or human resources assistance to the latter State Party...to facilitate the marking, clearance and destruction of such cluster munition remnants.

Article 4 (4) (b) – Such assistance shall include, where available, information on types and quantities of the cluster munitions used, precise locations of cluster munition strikes, and ones in which cluster munitions are known to be located.

Article 6 (3) - ...The States Parties shall not impose undue restrictions on the provision and receipt of clearance and other such equipment and related technological information for humanitarian purposes.

Article 6 (6) - Where, after entry into force of this Convention, cluster munitions have become cluster munition remnants located in areas under the jurisdiction or control of a State Party, each State Party in a position to do so shall urgently provide emergency assistance to the affected State Party.

Article 21 (1) - Each State Party shall encourage States not party to this Convention to ratify, accept, approve or accede to this Convention, with the goal of attracting the adherence of all States to this Convention.

Appendix B

Major International Instruments Governing Armed Conflict and Post-War Obligations

This compilation of treaties, conventions, and world institutions were selected for their relevance to armed conflict, including conduct during war, protections for civilian populations, and obligations of States Parties for cleanup and reparation. Given the breadth of international law, this list is exemplary, not exhaustive.

The International Committee of the Red Cross (1863) – The world’s largest humanitarian organization, and the driving force behind the development of international humanitarian law. It oversees and ensures humanitarian protection and assistance for victims of armed conflict and other violence.

The Hague Conventions of 1899 and 1907 – Multilateral treaties that were among the first formal statements of the laws of war, war crimes, and disarmament. This included a voluntary international court for compulsory arbitration to settle international disputes; identifying conditions for the belligerency of war; and establishing the rights and obligations of persons in war.

Peace Treaty of Versailles (1919) – The treaty which effectively ended the First World War. It required "Germany [to] accept the responsibility of Germany and her allies for causing all the loss and damage" during the war, including forcing Germany to disarm, make substantial territorial concessions, and pay reparations.

The League of Nations (1920) - the first international organization established to maintain world peace through collective security and disarmament; settling international disputes through negotiation and arbitration. Other issues in this and related treaties included labor conditions, just treatment of native inhabitants, human and drug trafficking, the arms trade, global health, prisoners of war, and protection of minorities in Europe.

The Geneva Protocol of 1925 (Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare) – A treaty drawing upon the language of The Peace Treaty of Versailles to prohibit the use of chemical and biological weapons in international armed conflicts.

Charter of the United Nations (1945) – The founding treaty of the United Nations, of which the Statute of the International Court of Justice is an integral part. The Charter was created in the wake of war to reaffirm the global commitment to human rights, and states in the Preamble that unless in the common interest, the use of force shall not be used.

International Court of Justice (1945) – The ICJ was established in 1945 by the UN Charter. It is the primary judicial branch of the United Nations; all state members of the United Nations are automatically parties to the Court's statute. It decides, in accordance with international law, disputes of a legal nature that are submitted to it by States.

Geneva Conventions of 1949 – The Conventions establish the conduct of states in armed conflict and protections for civilians. Addressed in foregoing chapters.

European Court of Justice (1959) – The highest court in the European Union in matters of European Union law. As a part of the Court of Justice of the European Union it is tasked with interpreting EU law and ensuring its equal application across all EU member states.

ENMOD Convention (1977) – Addressed in foregoing chapters.

Inter-American Court of Human Rights (1979) – The Court enforces and interprets the provisions of the American Convention on Human Rights. Its two main functions are adjudicatory and advisory; under the former, it hears and rules on the specific cases of human rights violations referred to it.

Convention on Conventional Weapons (1983) – Addressed in foregoing chapters.

International Criminal Tribunal for the former Yugoslavia (ICTY, 1993) - An ad hoc court in The Hague that prosecutes serious crimes committed during the Yugoslav Wars, and to try their perpetrators.

Chemical Weapons Convention (1997) – Addressed in foregoing chapters.

International Criminal Court (1998) – The ICC is a treaty court established to prosecute individuals responsible for crimes of genocide, crimes against humanity, and war crimes.

African Court of Human and Peoples' Rights (2004) – The Court ensures respect for and compliance with the African Charter on Human and Peoples' Rights, as well as other international human rights instruments, through judicial decisions.

Protocol V of Chemical Weapons Convention (2006) – Addressed in foregoing chapters.

Convention on Cluster Munitions (2010) – Addressed in foregoing chapters.

Appendix C

Obligation of Appropriated Funds for Agent Orange/Dioxin Related Activities in Vietnam by Fiscal Year and Type of Activity

Program Component/Activity	Implementing Partner	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	TOTAL
HEALTH/DISABILITY									
Empowering People with Disabilities in Danang	Save the Children (SC)	400,000		799,980	-	-	-	-	1,199,980
Rehabilitation Services and Socioeconomic Support to People with Disabilities in Danang	Vietnam Assistance for the Handicapped (VNAH)	382,344	-	906,064	-	-	-	-	1,288,408
Support of People with Disabilities in Danang	East Meets West Foundation (EMW)	200,000	-	300,000	-	-	-	-	500,000
Disability Support Program	Development Alternatives Inc. (DAI)	-	-	-	-	5,192,582	2,477,342	-	7,669,924
Disability/Health Assessment	Chemonics	-	-	-	103,000	-	-	-	103,000
Disability/Health Support Inter-agency Agreement (IAA)	Center for Disease Control (CDC)	-	-	-	-	53,169	-	-	53,169
Program Support	USAID	17,656	96,102	118,009	100,000	70,907	200,000	75,000	677,674
Subtotal Health/Disability		1,000,000	96,102	2,124,053	203,000	5,316,658	2,677,342	75,000	11,492,155
ENVIRONMENTAL REMEDIATION									
Assessments and Engineering Designs and Plans for Dioxin	CDM International, Inc.	-	1,450,000	681,076	2,411,200	-	-	-	4,542,276
Program Component/Activity	Implementing Partner	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	TOTAL
In-pile Thermal Desorption (IPTD) Design for Dioxin Remediation at Danang Airport	TerraTherm, Inc.	-	-	-	-	1,336,486	-	-	1,336,486
In-pile Thermal Desorption Implementation for Dioxin Remediation at Danang Airport	Tetra Therm, Inc.	-	-	-	-	-	16,492,658	11,209,712	27,702,370
Construction Management Oversight of Remediation at Danang Airport	CDM International Inc.	-	-	-	6,000,000	2,336,444	-	-	8,336,444
Bien Hoa Environment Assessment	CDM International, Inc.	-	-	-	-	-	5,200	500,000	505,200
Program Support	USAID	-	453,898	194,871	300,000	463,000	824,800	489,430	2,725,999
Subtotal Environmental Remediation		-	1,903,898	875,947	14,140,608	15,702,734	17,322,658	12,199,142	62,144,987
Total Health/Disability and Environmental Remediation Program		1,000,000	2,000,000	3,000,000	14,343,608	21,019,392	20,000,000	12,274,142	73,637,142

Source: USAID, as of May 29, 2014.

Notes: USAID was unable to provide CRS with updated obligation data for FY2013 and FY2014 in time for inclusion in this report.

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