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# US Chemical Weapons in Panama: A Dangerous Legacy

*An edited version of the report, "Test Tube Republic: Chemical Weapons Tests in Panama and U.S. Responsibility," authored by John Lindsay-Poland of the Fellowship of Reconciliation, with the active collaboration of the Chemical Weapons Working Group, Earthjustice Legal Defense Fund, Greenpeace, Panamanian Center for Research and Social Action (CEASPA) and Center for Latin American Studies (CELA). On August 30, the Panamanian people voted down the referendum of President Pérez Balladares to run for reelection. With "El Toro" out of the race, no one knows who will receive the Panama Canal from the United States on December 31, 1999. Much more important, no one yet knows if the territories that Panama will receive will be clean and safe.*

## John Lindsay - Poland

In early 1998, the United States went to the brink of war with Iraq over the latter country's refusal to comply with United Nations resolutions regarding inspections for chemical weapons facilities on Iraqi soil. Chemical weapons represent a serious threat to the world community's safety and well being. A single bomb filled with VX nerve agent, of the kind Iraq has been accused of maintaining, has enough lethal doses to kill millions of people.

For this reason, the Chemical Weapons Convention (CWC), an international treaty which entered into force on April 29, 1997, is a major advance in turning back the threat of chemical weapons. The Convention requires the destruction of all chemical weapons, both stockpiled and abandoned, within 10 to 15 years.

In Panama, the United States had an active chemical weapons program from at least 1930 until 1968. From 1930 to 1946, this program focused on canal defense. From 1943 until 1968, the program aimed to test chemical munitions under tropical conditions. Dozens of tons of mustard gas and phosgene were stockpiled at a number of sites in Panama, particularly from the 1930s to the 1950s. Unused and dud chemical munitions were also abandoned in Panama.

Today, like many other countries, Panama is experiencing rapid urban growth. It is focused on the canal area, where half of Panama's entire population now lives and works. The growth is accompanied by major road projects to address traffic congestion. While many lands in the canal area are being settled or developed, other projects are attempting to reforest lands that have been denuded by timber interests and slash-and-burn agriculture.

The turnover of properties pursuant to the 1977 Panama Canal Treaties is accelerating these transitions. Lands on military bases to which most Panamanians have never had formal access will come under Panamanian jurisdiction by December 31, 1999. Without a national military or US geo-strategic interests, the lands will be transformed to fit Panama's emerging identity.

In these circumstances, it is critical that Panamanians gain an understanding of the legacy they are receiving. It is also crucial that the United States cooperate to ensure that the transition not leave behind dangers to human and environmental health and safety, and that it transfer documents on the histories of lands being turned over to Panama.

## Chemical Weapons in Panama

Chemical weapons were a component of US canal defense tactics from the canal's early years. The canal was completed in August 1914, only days before the outbreak of World War I, the war in which mustard gas was used for the first time ever in battle. The United States, without gas masks of its

own and with chemical warfare activities fragmented in four departments, was not well prepared to face massive gas attacks.

General William Sibert, the Army engineer who had designed the Gatun locks in Panama, commanded the first division of US troops to go overseas in the war, sailing for France in June 1917. Within a year, Sibert, a "staunch advocate of all forms of chemical warfare," was made director of a newly consolidated Chemical Warfare Service. He brought the agency's disparate activities together, so that by the end of the war the United States was producing more lethal gas than all other belligerents combined.

After the war Sibert became a vocal proponent of the continued development of chemical weapons. "When the armies were provided with masks and other defensive appliances, something less than four percent of the gas casualties were fatal," Sibert ruminated. "These figures, I think, meet one of the chief objections brought against the use of gas—that of humanity. So far from being inhumane, it has been proved that it is one of the most humane instruments of warfare, if we can apply the word humane to the killing and wounding of human beings."

In 1921 the Chemical Warfare Service was told to draw up plans for defense of the Canal Zone and other US outlying possessions. The first chemical defense plans were thus drawn up in 1923 and would be updated every year through at least 1946. The plan involved bombing with mustard gas the trails and routes that led inland from landing beaches on both the Atlantic and Pacific coasts, spraying the beaches, and firing chemical mortars at military targets as well.

Another chemical weapons supporter, Major General Preston Brown, came to the helm in Panama in 1930. At this time the military maintained a chemical company of 2 officers and 77 men. Brown believed that in case of a land invasion, troops could use gas defensively as they retreated through the jungle.

The US entry into World War II both increased military sensitivities to the Canal's vulnerability to attack, and brought with it whole new areas of responsibility and control. Besides defending the canal using chemical munitions, the military planned to use smoke pots that burned oil or chemical blends in order to visually screen the canal should enemies attack the canal by air. Several hundred of the smoke pots were sent to the Canal Zone in 1942.

### **The San José Project**

The United States, Great Britain and Canada collaborated closely in the 1940s on testing and development of chemical weapons. The collaboration included sharing data from test sites in Australia, India, the Canadian province of Alberta, and Bushnell, Florida. Anticipating possible defensive or offensive use of chemical weapons against the Japanese, the Allies sought an understanding of how chemical weapons could be used in case of further invasions of the Japanese-occupied Pacific islands.

In searching for a jungle testing ground for chemical weapons, the Chemical Warfare Service sought a jungle site with "lack of human habitation, safety distances to nearby islands, tropical jungle, good water, absence of disease and poisonous snakes," and accessibility to nearby airfields controlled by the US military. In October 1943, Colonel Robert McLeod searched up and down the coasts of Costa Rica, Nicaragua, Peru, Panama and the Galapagos Islands of Ecuador. Discarding, among others, Panama's penal colony on Coiba Island because the presence of prisoners might have "complicated our problems," McLeod settled on San José Island, the second largest island of the Perlas group in Panama Bay.

The military acted quickly. On December 20, 1943, the US Consul proposed to conduct "certain chemical warfare tests under existing jungle conditions" for 60-day renewable periods on San José Island. The agreement had to be made with both the government of Panama and the island's private owners, a Panama City firm called Huertematte & Co. A rental fee of \$15,000 a year was agreed. The United States also sought Panama's consent to build trails and wharves and to incorporate the agreement into the 1942 base agreement signed the year before.

The project formally began on January 6, 1944, two days after Panama gave permission to the United States to conduct "chemical warfare tests" on the island. Within days hundreds of Army engineers arrived on the island to clear roads and an airstrip and build the many buildings for operations and housing the project would use. More than 400 enlisted men were stationed on the island by mid-1945, as well as nearly 200 officers and civilians from the United States, Panama and other countries. Many of the Army troops were Puerto Rican soldiers.

### **Chemical Weapons Tests Continue in the 1950s**

From February 1953 through February 1957, the Tropical Test Team, a Chemical Corps unit that included 20 personnel, conducted tests of distilled mustard gas every three months in Panama. The tests included pressure tests of one-ton containers of mustard, as well as freezing of the distilled mustard. The team conducted most tests of toxic materials in Curundu, as well as some on a knoll on the Chiva-Chiva Trail. Toxic materials were stored in a large open building in Cerro Tigre, while munitions were kept nearby in igloo-type magazines. A report from that time clearly indicates that tests included detonation of chemical mines. Today, this area apparently is no longer either restricted or well marked. A visit to Cerro Tigre in April 1998 showed that the area was grown up with vegetation, without fences or signs.

In 1961, the US Army Chemical Corps participated in a transport exercise called Swamp Fox I, which took place primarily in the Darién region of Panama, not far from Colombia. The exercise involved firing 58 CN tear gas grenades in the jungle, though the report obtained for this study did not specify exact locations." A second Swamp Fox exercise, sponsored by several Army agencies, was carried out in Panama in 1964. The US Army Tropic Test Center used a site on Empire Range to test tear gas grenades in 1965, according to an assessment of the active ranges.

### **Nerve Agent Tests**

Documents show at least four tests in Panama with live chemical munitions from 1964 to 1968 (VX gas-filled M-23 mines, rockets and projectiles, and sarin rockets). The tests were part of a range of tests under Arctic, desert and tropical conditions to which chemical munitions were usually subjected. Twenty-four M23 mines were shipped to each site in late 1963 or early 1964. Each mine contained 10.5 pounds of VX agent. Since ten milligrams of VX agent constitutes a lethal dose, each one had enough nerve agent for nearly half a million lethal doses.

The mines were stored outdoors for between 30 days and more than two years, depending on the "storage cycle" assigned to each mine. Finally, each mine was detonated, and the report available indicates that the VX mines may have been detonated with live agent inside. The report states: "During each cycle, three mines (VX or simulant-filled) will be subjected to a firing test to determine the functionability of mines and components." Despite the reference to simulant, the materials list for this test does not include any simulant, although some warheads may have been shipped to test sites with simulant, as a control on the experiment.

The United States discontinued production of VX agent, as well as the M55 rocket, in 1968. Sarin (GB) production ceased in 1957, but it has remained in the US stockpile until the present day.

## Post-1968 Activity

On November 19, 1969, the US Congress passed Public Law 91-121, which prohibited deployment, storage or disposal of lethal chemical or biological agents outside the United States unless the host country was first notified. For overseas locations under US jurisdiction, the law required prior notice to Congress. We have found no documentation of the storage or testing of live lethal chemical agents in Panama since 1968. One exception to this is that the US military has acknowledged "limited, controlled laboratory testing of some tear gas agents" in Panama since 1979.

At chemical test sites, Army policy since 1980 requires the use of only simulants. In 1987, the Army's 193d Infantry Brigade conducted a training exercise in Panama called "NBC Stakes," designed to prepare soldiers for potential chemical combat. ("NBC" stands for nuclear, biological and chemical.) Soldiers had to pass through simulated contamination by chemical agents and nuclear radiation while keeping their gas masks and other protective gear on.

The Tropic Test Center (TTC) continues in the 1990s to test equipment designed to detect and defend against chemical agents under tropical conditions. "There has been a significant increase over the past two years in the testing of this type of equipment," the TTC wrote in July 1997. The TTC emphasized that "testing this type of equipment involves no use of actual agents," but uses simulants instead.

## Tons of Gases Stored in Panama

In 1930, when Major General Preston Brown was promoting chemical weapons for canal defense, the military kept a supply of 30 tons of persistent gas in Panama. By 1940, the United States had 84 tons of mustard gas, 10 tons of phosgene, 800 phosgene shells, 900 Livens projectors, 647 chemical cylinders, and 2,377 4.2-inch mustard-charged mortar rounds on hand in the Canal Zone. From July of that year until the following May, the Chemical Warfare Service (CWS) acquired expanded space in Panama—code named "Mercury"—and received shipments of gas masks.

The space included chemical munitions storage magazines in seven bases: Camp Paraíso, Fort Clayton, Corozal Post, Albrook Field, Howard Field, Río Hato, France Field and Fort Gulick. Most chemical munitions before the San José Project was established, however, were stored at Cerro Tigre, where a monorail hoist had been installed to move a set of mustard gas drums are placed in a niche in the side of...munitions. "the hill," wrote Lt. Col. Homer Saint-Guadens in the Spring of 1941. But Cerro Tigre was subject to earth slides, including one that had destroyed a magazine in 1935, prompting selection of a different site when storage areas for conventional ammunition were expanded in 1938. In the 1950s, chemical munitions continued to be stored at Cerro Tigre. Nerve agents tested from approximately 1964 to 1968 were also stored at Cerro Tigre.

Chemical munitions flown into San José Island were stored at Río Hato. In 1946, a chemical officer was sent to inspect the San José ammunition dump (i.e., storage area) in Río Hato "following an inspection by a non-technical officer who painted a terrible picture of conditions." Río Hato, like San José Island, was evacuated in January 1948 after Panama rejected the Filos-Hines Agreement for continued use of those and a dozen other military sites.

## Chemical Weapons Tests

The first chemical weapons test using live agent known to be carried out in Panama occurred on Fort Clayton before the United States' entry into World War II.

More than 130 tests were conducted on San José Island between May 1944 and the end of 1947. Many of them were "drop tests" involving aircraft that dropped chemical munitions into target areas. Others required troops to fire chemical mortars into the test areas, and still others involved more controlled use of munitions. In a very few cases, project reports indicate the use of chemical simulants, but live agent was employed in most.

From available documents, the numbers of munitions tested are known for 18 of the 130 tests conducted on San José Island. In these tests 4,397 chemical munitions were fired, for an average of 244 in each test. Most of the munitions fired—3,816—were 4.2" mortars charged with Cyanogen Chloride, mustard or phosgene, but the chemical munitions also included bombs from 100 pounds to 1,000 pounds in weight and 105mm Howitzer shells. The San José Project also tested chemical munitions on the sea off of Panama in order to determine whether chemical warfare could be effective against enemy ships. In addition, according to a military map drawn up in 1946, tests included chemical spray on Iguana Island, which was also used as a conventional bombing range.

### Tests on Humans and Animals

Many of the tests on San José Island used rabbits or goats to observe how lethal various methods of attack or how effective gas masks were. "They brought goats from Ecuador," said José Alsola, a Peruvian who worked on San José in 1946 clearing vegetation for paths and an airstrip. "They put those gases on them. The skin fell off the animals, they died and they ended up cooked. The animal was red, red! Like it was cooked, burnt."

### AN EARLY GUINEA PIG

*Jack Cadenhead had enlisted in the Army in Greenville, South Carolina in 1940 to escape the Depression and an oppressive job in the local cotton mill. Sent to the Canal Zone, he and others in the 33rd Infantry Regiment were taken to a long narrow building on Fort Clayton one day in July 1941. There they were given gas masks, exposed to a form of tear gas and told to lift experiment asked for ten volunteers.*

*"They said they wanted some men who didn't smoke," Cadenhead recalled. He raised his hand. "It's hot, close to a hundred degrees in Panama, with no air drop stuff in a container, and it would fog up."*

*The operators had gas masks on, Cadenhead said, but "they didn't tell us a thing, they just run us through there pretty fast." The building was long, so long that the men were forced to breathe in the mustard as they ran. The men quickly developed problems breathing, and were rushed on stretchers to nearby Gorgas Hospital. "The guy with me, Bill Hansard, almost choked to death when we got to Gorgas," Cadenhead remembered. "I was in ahead of him. He was blue around his mouth. They said, 'We need to get him in here.' It was one of the medical aides, I think, and he asked the doctor, 'What's wrong with them?' and the doctor said, 'It's that damn mustard gas!'"*

*"Mustard gas loves wet low places, that's where it hangs out. It's the same on your body, where you sweat or it's humid," said Cadenhead, who has had health problems ever since. It permanently affected his speech, blisters would come up on his feet as big as a half-dollar, and the end of his penis turned white. "I thought I had leprosy for awhile," Cadenhead said. More than fifty years later, he still has problems breathing. When he wrote back saying that his records from Gorgas Hospital had been destroyed. "We were all just kids, we didn't know what was going on. After I got older and wiser, I felt we were used as guinea pigs."*

*Cadenhead's experience may have reflected the decision of one or two field commanders, since widespread use of human subjects by the United States for tests of mustard and Lewisite (an arsenic compound), in Panama or elsewhere, did not begin until 1943. In June 1943, the Chemical Warfare Service, together with Army and medical units, also tested protective clothing in Panama, but it is unclear whether chemical agents were used in these tests.*

The Signal Corps' 1945 film about the project shows a comparative test with three goats—one with an American gas mask, one with a Japanese gas mask, and one without any gas mask. With the goats tethered to stakes and the camera running, the area is gassed with mustard. Two of the goats writhe and fall, while the goat with the American gas mask survives "unharm[ed]." One of the apparent purposes of the film is to reassure the soldiers viewing it that in case of gas warfare with the Japanese, the United States would not only win, but with few casualties.

But military and civilian researchers had long believed that tests on non-human animals alone were inadequate. A civilian scientist, writing about tests conducted in 1943 with blistering agents such as mustard, said that because in animals "the reactions of the skin vary so greatly from species to species... it was soon found that the only constantly reliable test object was man."

Several of the San José Project tests involved human subjects, in all cases military troops. These included "patch tests," which called for applying drops on a soldier's forearms, often after protective ointment had been put on one of them. "They had volunteer soldiers," one project participant recalled. "They dropped live bombs. They would contaminate the area with gas. The volunteer soldiers would go into the area, after of course, with full protective garments... They would have a cut-out area on their forearm or wrist. They would test the effect of protection against the blistering gases."

One of the San José tests, carried out in 1944, sought "to determine if any difference existed in the sensitivity of Puerto Rican and Continental US [i.e., Anglo-Saxon] Troops to H gas [mustard]." The tests involved applying liquid mustard to the under-surface of the forearms of each subject, then observing for three days. A summary of the test produced by Defense Secretary William Cohen in April 1998 implied that some men were hospitalized after they "sustain[ed] severe body burns or eye lesions."

### Post-1950s Tests

Reports on four tests of nerve agent-filled warheads were obtained for this study. The US Army Tropic Test Center (TTC) conducted the tests between 1964 and 1968 "to determine the effects of environment on the storage"—and, in two of them, on the operation—of the warheads. Three of the tests were for VX agent weapons. The fourth test concerned 29 sarin 115-millimeter rockets. The weapons were to be stored for approximately two years, "outdoors on pallets under ventilated cover," and periodically tested for leaks, pressure, visual defects and integrity of the agent. The three tests of M-55 rockets and VX rockets and projectiles were accompanied by 120 simulant-filled weapons for each test series.

The M55 rockets filled with nerve agent had a serious defect: they leaked. "The M55 rockets are considered the most dangerous items in the current [US chemical] stockpile for a variety of reasons," according to a 1992 report by the US Office of Technology Assessment. "The M55 rockets are... the source of the greatest number of leaking munitions," the report went on. The plan does not require removal of the leaking rocket from Panama. In all cases, if the location of a leak could not be found, testers were to drain the agent from the warhead, decontaminate it, and destroy the liquid nerve agent.

The nerve agent tests were most likely conducted somewhere within the canal area, since from 1964 to 1968 the only site outside the canal area controlled by the US military was Río Hato. The TTC used 54 other sites as well, all within the canal area.

## Dumped at Sea or Stored for "Rehab"?

Less information is available on the disposal of chemical munitions stockpiled or used in tests in Panama than on tests themselves. As one San José Project participant commented, "We didn't worry too much about things like that at that time."

Stockpiled munitions, such as those stored at eight continental US sites and on Kalama Island in the Pacific are kept in a controlled, contained manner where they can be continuously monitored and re-packaged if a munition is in danger of leaking. Non-stockpiled weapons are those that are no longer part of the stockpile. They have not been contained or monitored, nor have they been kept safely away from public access areas. Non-stockpile weapons also include chemical agents that have contaminated land or water even though a munition is no longer present.

All chemical munitions, like conventional munitions, include a certain number of duds—that is, munitions that are fired or dropped but do not detonate. On impact areas, these unexploded ordnance (UXO) are typically what cause accidents to persons who unsuspectingly pick up, step on or play with them. According to one explosives expert, the rule of thumb is a 10% dud rate. For the 18 tests on San José Island for which we have obtained records, 4,397 mortars and bombs were used. If other tests averaged the same number of chemical munitions fired or dropped, it would mean 31,267 used. At a dud rate of 10%, that would leave 3,126 chemical UXO on San José Island.

Regarding stockpiled munitions, the San José post diary records a barge shipment that took chemical munitions approximately 30 miles out to sea to be destroyed on March 11, 1947. Another barge-load of munitions was dumped at sea on August 19, 1947.

The military's evacuation of the San José Project in early 1948 was carried out with haste, on a five-week deadline received from headquarters. "Beating the deadline was not accomplished by working union hours," two officers wrote sardonically. Another barge was loaded with chemical munitions, which were then dumped at sea on January 12, 1948.

A summary of the San José Project written by the military for the Carter White House in 1979 said that "known munitions were destroyed and detoxified" when the island was evacuated. But the reported added: "In some tests, complete functioning of munitions could not be verified because of the jungle and marsh environment." In other words, the United States was aware in the 1970s that chemical munitions remained on the land at San José Island.

Chemical munitions that the military still hoped to use were moved into the Canal Zone. Two of the project's officers wrote: "The materiel owned by San José was stored wherever space could be found. Some of it was placed in the basements of barracks, more in an abandoned motor pool, and a toxic yard was established at the mouth of the Chagres River on the Fort Sherman Reservation." They did not elaborate on this alarming declaration. The toxic materials at Fort Sherman were stored there for "rehabilitation," according to a later account, which may have meant leaks from munitions in need of repair. We have found no records documenting what the United States did with chemical bombs stored at Río Hato, which also was evacuated in January 1948.

Based on National Archives documents that he saw while working for military contractor PRC on a study of the active ranges in Panama, bomb expert Rick Stauber asserts that the United States established a chemical burial site at France Field in the 1930s. The documents Stauber found indicated that 30-lb bombs that leaked mustard were involved, and that there were both land burial and sea dumping of these munitions. According to Stauber, the same documents stated that a storage magazine at France Field had been contaminated by leakage of mustard agent.



A version of this statement was featured on the front page of a Panamanian newspaper on April 13, 1998. In an implicit admission of it, a spokesman for the US Department of Defense, whose identity was not disclosed, was reported in an official document to have told officials of Panama's Interoceanic Region Authority (ARI) that "there is no danger of contamination by toxic gases in France Field, since the materials buried there by US troops in World War II have already dissipated." According to the report, the US Defense Department evaluated the need to remove the airstrip of the then-existing airport to remove the material buried there before the transfer of the area in 1979, when the Panama Canal Treaties entered into force. The Defense Department experts concluded that the effort was not justified, since the gases in question did not represent then or now any risk, considering that their useful life is less than ten years.

The Army has also implicitly recognized that there are chemical burial sites in Panama by refusing to release part of a document listing "suspected overseas burial sites" produced by the US Army Chemical and Biological Command in 1993. If there were no burial sites of chemical agent or munitions in Panama, the Command presumably would have said so in declining to release the document. However, even without the list of burial sites, souvenir seekers, erosion and development may eventually uncover their locations. As noted earlier, Chiva Chiva Trail was a demolition and disposal site for toxic munitions from 1952 to 1956.

Laboratory tests using chemical weapons, conducted in the 1950s and 1960s, pose additional questions about disposal of the agents. In Panama, "there could be the situation where laboratory wastes, such as glass vials, could be present in the environment," according to toxicologist Theodore Henry. "For instance, an intact glass vial of VX was found in the ground at [Aberdeen Proving Ground]. Such lab wastes are more sensitive to environmental release, and cannot be detected from the surface, as... munitions [can]."

### **Potential Long-Term Dangers**

Health hazards of chemical munitions can be long-lasting, as demonstrated by continuing burns of Chinese people by chemical munitions that were abandoned by the Japanese army in China during World War II. As one study of chemical munitions abandoned in China notes, abandoned chemical weapons (ACW) "pose much greater hazards to civilians than military stockpiles of chemical weapons, such as those stored in depots in the United States and Russia. Military stockpiles are stored in special bunkers under lock and key, so that barring a catastrophe, ordinary citizens face no immediate threat. Since the location of many ACW is not known and civilians lack an understanding of their hazards, they risk being accidentally exposed to these weapons."

China asserts that Japan abandoned two million chemical munitions on its territory, most of them in Jilin Province. As recently as 1987, over 200 people were injured when workers attempted to set fire to a barrel of liquid mustard in order to determine what it was. In 1991, 20 people experienced dizziness, nausea and breathing problems after leaking phosgene mortars were discovered at a junior high school. Closer to home, World War II-era chemical rounds recovered at Edgewood Arsenal, Maryland in 1994 were still able to detonate, despite their age. In that case chemical rounds were misidentified as conventional munitions, which when detonated released 11 pounds of mustard agent into the environment.

### **A "Short Shelf Life"?**

DOD treaty implementation director Richard McSeveney made a striking claim about chemical munitions—"they have a short shelf life." His statement echoes the other military officer's reported statement to Panamanian officials that chemical agent or munition in burial sites has "dissipated." However, neither official offered any substantiating data or precedent for their assertions.

Chemical agent that has been sprayed or exploded does dissipate, but agent that is stored or abandoned in canisters or drums can survive for decades. "Where nerve and other [chemical warfare] agents hydrolyze quite readily," writes John Hart, an expert on abandoned chemical weapons, "mustard does so only very slowly. Instead a hardened, protective gel forms around its exterior. The mustard in the interior can remain active for decades." This is why fishermen in the Baltic Sea are still sometimes injured by chemical weapons, dumped there more than 50 years ago, which they catch in their nets.

Our experience indicates that chemical warfare agents remaining in storage containers or munitions, or otherwise retained in bulk quantities, can retain essentially all of their toxic agent properties for many years. Even unexploded munitions recovered from the World War One era are often found to contain chemical warfare materiel whose toxic effects have been but little degraded by the passage of time. For this reason, recovered suspect chemical warfare munitions and containers must be treated with extreme care, and handled and disposed of only by properly trained authorities. Moreover, when chemical warfare agents degrade, they often turn into compounds that are also very toxic to humans, particularly if exposed to drinking water. Finally, chemical munitions typically contain conventional munitions to burst the chemical filling. Buried or dud chemical rounds or bombs with these explosives can be as hazardous as other unexploded ordnance.

In addition to the acute symptoms from exposure to live chemical agents, ranging from temporary burns to death, exposure can cause chronic and delayed effects as well. Long-term injuries from exposure to mustard agents include respiratory and skin cancers, leukemia, asthma, chronic bronchitis, emphysema, chronic laryngitis, eye problems, conjunctivitis, traumatic stress disorder and sexual dysfunction. "There is no doubt that the long-term health consequences of exposure to mustard agents or Lewisite can be serious and, in some cases, devastating," the Institute of Medicine reported in 1993. In addition, because no one knows definitively the health effects of low-level exposure to chemical agents, the United States may not assume that burial sites are harmless.

### **The US Record: "Classified"**

The complete transfer of canal-area lands under the Panama Canal Treaties by December 31, 1999 creates a key historical moment. Panamanians will soon have full sovereignty over and responsibility for these properties. Because the lands have been under US control for over 90 years, most Panamanians have little or no idea of their history of use, especially of military activities, which have typically been kept secret. A responsible reversion of these lands must include the transfer by the United States government to Panama of all historical documents related to activities that have had impacts on canal area lands. The record of information transfers to date falls considerably short of that goal.

According to Panamanian officials and records, the Government of Panama has repeatedly and formally requested documents from the United States on chemical weapons tests in Panama. On January 28, 1997, the Ministry of Foreign Affairs requested a series of documents including one on "Detection Chemical Agent, Nerve Vapor." On August 1, 1997, the Ministry broadened its request for information to documents on chemical weapons tests generally. The Ministry also requested relevant portions of a list of "suspected overseas burial sites." But, according to Foreign Ministry officials, the United States had not given Panama a single document on chemical weapons programs conducted in Panama—until June 1998, as this report was in preparation. At that time, the United States released to Panama copies of the four nerve agent test reports cited above. In all other cases, US military officials have responded with brief letters describing chemical warfare activities in general terms.

In June 1997, the Fellowship of Reconciliation also requested portions of the 1993 annex listing suspected overseas chemical munitions burial sites. The request, made for the section of the document that dealt with suspected sites in Panama, was denied. The denial was appealed in July 1997, and the appeal was denied in May 1998. The reasons given for denying the annex are instructive. The Army General Counsel's Office stated that the document is correctly classified "because the requested material contains information concerning weapons systems and information of a foreign government, and the information could assist in the development or use of weapons of mass destruction." In other words, the Army may be conceding that the chemical agents abandoned in Panama have not simply "dissipated" into a harmless state or even into a militarily useless condition.

The Department of Defense's problems with disclosing historical information about its activities are systemic. Dugway Proving Ground, located in Utah, was the controlling agency for chemical weapons programs in Panama in the 1950s. During the course of this study, a "key-word search" of documents referring to Panama, Tropic Test and several other words or phrases done by its technical library came up with 2,252 documents. The base commander subsequently denied a request by the Fellowship of Reconciliation to visit the Dugway library, even though Dugway's legal and intelligence offices had approved it. A former project manager of the Tropic Test Center, contracted by the Defense Department to research TTC's projects in Panama, had a similar experience when he requested to use the technical library and historical office of the Aberdeen Proving Ground in Maryland, which served as headquarters for US chemical warfare programs for many years. In other words, the US military's current operations—at least in this case—take precedence over the historical research necessary to be held accountable for its activities in the past.

### **Biological Warfare Programs**

During World War II, the military developed an increased interest in biological warfare, both defensive and offensive. Since plans for military use of biological agents focused on their transmission through aerial spray techniques, studies of aerosol spray patterns in Panama may have been designed to explore how biological agents could be used there. Dugway Proving Ground's technical library lists a number of such studies.

The National Institutes of Health's Middle America Research Unit (MARU) actively used biological agents in Panama. MARU "handled some of the deadliest and most infectious diseases known to medicine at the time," according to Carl J. Peters, a scientist who worked there in the 1960s. One disease in particular that MARU worked with was Venezuelan Equine Encephalitis (VEE), a naturally-occurring virus which incapacitates but generally does not kill its human victims. Instead, VEE begins abruptly with high fever, chills and aches and an intense aversion to light, then typically is gone within a week or two. In Central America in the 1960s, VEE attacked horses and mules, leaving many dead, and MARU sought to stem the disease's migration toward the United States through development of a vaccine. But Peters writes:

"Nobler designs aside, however, the US government had other reasons to be interested in VEE. The symptoms in humans are so incapacitating that VEE had been seen as a potential biological weapon. The army wanted to develop different categories of biological warfare agents: incapacitators as well as killers. With a relatively short incubation period of two to three days, VEE could be an ideal incapacitator: neutralizing an enemy population right before a battle without risk of killing innocent civilians or committing wartime atrocities. With that as a plan, the Army had developed a vaccine to protect our troops in case an enemy tried to use it on them, or presumably in case the wind blew the wrong way the day they tried to use it on someone else."

The Army authorized MARU to test a live-attenuated vaccine on horses in the field, and Peters describes such tests on Costa Rica's Pacific coast. The Gorgas Memorial Laboratory also studied VEE among humans in Almirante from 1960 to 1962 and in Darién and the urban communities of Patoistown and Zegla in 1968, as well as in laboratory animals during the same periods. The studies included testing live vaccines of VEE on animal subjects. VEE has persisted for long periods in Panama. Troops training at Fort Sherman in 1981 contracted it, an exposure that was linked to VEE in 1970, when the military was actively experimenting with VEE. The Walter Reed Army Institute of Research reported:

"An outbreak of Venezuelan Equine Encephalitis (VEE) occurred in a unit of military personnel who had gone to Panama for jungle training in 1981. Exposure was linked to training in October in an area of Fort Sherman that was previously implicated over ten years ago. An intensive serological survey identified five cases presenting fever, chills and headaches. VEE remains a threat to US forces deployed to specific areas of Central America."

In addition, 1977 news accounts cited intelligence sources who claimed that in 1971 US intelligence agents brought Swine flu from Fort Gulick (Espinar) in Panama to Cuba, where the flu apparently contaminated a large number of pigs. The United Nations Food and Agriculture Organization called the epidemic of swine flu that hit Cuba in 1971 the "most alarming event" of that year. According to the accounts, an intelligence agent was given a sealed unmarked container and instructed to deliver it to an anti-Castro group in Panama. Cuban exiles interviewed for the report said they received the container off Bocas del Toro in Panama and brought it to contacts to the small island of Navassa, whence it was shipped to Cuba in late March 1971. The first Cuban pigs contracted the flu on about May 6. Cuban authorities slaughtered half a million pigs in order to contain the epidemic.

Apart from the above information, however, we have not located documentation of current contamination by military biological agents in Panama. We also have not found documents indicating the testing or use of Agent Orange or other defoliants in Panama, though we do not discount the possibility that defoliants may have been tested there.

### **Biological Warfare Ends: US Has Legal Obligations**

In November 1969, President Nixon issued an executive order renouncing the use of all biological warfare agents, effectively ending any lawful development of the agents. The declaration led to the 1972 Biological Weapons Convention, which outlawed efforts to "develop, produce, stockpile, or otherwise acquire or retain" any biological weapons. The United States became one of the first parties to the convention. The US military subsequently converted stockpiled biological agents into harmless fertilizer.

The major obligations of the United States regarding chemical weapons in Panama are spelled out in the Chemical Weapons Convention (CWC) and the Panama Canal Treaty. The CWC entered into force on April 29, 1997, only days after the United States joined 109 other states in ratifying it. It requires party states to destroy all chemical weapons it owns or controls within ten years (15 years in exceptional cases). It also requires party states to "assign the highest priority" to protection of the environment. Nations that have abandoned chemical weapons on other nation states' territories are obliged to declare those weapons within 30 days of their ratification of the Convention. The declaration must include "all available relevant information concerning the abandoned chemical weapons." Once the affected nation ratifies the CWC, the nation that abandoned the weapons must destroy them, in cooperation with the affected nation. "For the purpose of destroying abandoned

chemical weapons, the Abandoning State Party shall provide all necessary financial, technical, expert, facility as well as other resources."

The Convention excludes from its definition of abandoned chemical weapons any munitions which were buried before January 1, 1977, and which remain buried, and chemical weapons dumped at sea before January 1, 1985. However, a state party must still declare chemical weapons that were buried or dumped at sea after these dates. The CWC defines abandoned chemical weapons as those produced after 1946, or produced between 1925 and 1946 which have been determined to be "usable."

The United States submitted declarations to the Organization for the Prevention of Chemical Weapons (OPCW), established by the CWC, within 30 days of the Convention's entry into force in April 1997. However, the US declaration did not include any declaration of chemical weapons abandoned in other countries. Since at the very least the United States abandoned chemical munitions on San José Island in Panama, this means that the United States is violating the Chemical Weapons Convention's requirement to declare chemical weapons abandoned in other countries.

The US Army South, in its plan to transfer active firing ranges to Panama, claims that the United States will completely fulfill the Canal Treaty's provisions. The plan makes no mention of the Chemical Weapons Convention, and curiously defines "chemical munitions" as follows: "Those inert munitions or items used to disperse smoke compounds, white and red phosphorous, and riot control agents. Excluded from consideration are chemical warfare materials and chemical compounds which, through its [sic] properties, produce hazards to human health, life or safety." Regardless of how the US Army might define chemical munitions for its own internal purposes, the CWC applies to all chemical weapons as defined in the treaty and irrespective of whether they were abandoned in the lands covered by the Canal Treaty or elsewhere. In addition, the CWC imposes reporting requirements on countries that ratify it.

On July 7, 1998, Panama's Legislative Assembly ratified the Chemical Weapons Convention and President Ernesto Pérez Balladares then signed it. Once the ratification is deposited with the United Nations, both Panama and the United States will face a series of obligations to implement the Convention.

As noted above, the United States is obliged to "provide all necessary financial, technical, expert, facility, as well as other resources" for the destruction of the chemical weapons it has abandoned in Panama. Panama must provide the cooperation necessary to facilitate such destruction.

Panama also has reporting obligations. Within 30 days of entry into force of the Convention for Panama, it must submit all relevant information about abandoned chemical weapons known to be on its territory. If it later discovers other such weapons, Panama must supplement its submission within 180 days. In addition, Panama must make the fullest efforts to ensure that these weapons are removed from its territory not later than one year after the Convention has entered into force. To this end, Panama has the right to request that the United States enter into consultation to create a mutually-agreed plan for the destruction of the weapons.

In 1979, the United States was prepared—if requested by the Government of Panama—to conduct a survey of San José Island to "determine the bounds of chemical contamination on the island and assess the feasibility of returning it to a 'safe for normal habitation' condition." The survey plan, developed by the Pentagon, would have taken eight to ten days, followed by an assessment of "an unspecified longer period dependent upon survey findings." Panama did not request the survey.

Compliance with the provisions of the CWC is monitored by a Conference of State Parties to the Convention. If the United States fails with "particular gravity" to fulfill its reporting obligations or to remove chemical weapons that it abandoned in Panama or that are in any area in Panama within its jurisdiction or control, the Conference may bring the issue to the attention of the United Nations General Assembly and the United Nations Security Council.

The 1997 Panama Canal Treaty applies to all lands within the former Canal Zone. Under the Agreement on Implementation of Article IV of the Canal Treaty, the US government must "take all measures to ensure insofar as may be practicable that every hazard to human life, health and safety is removed from any defense site or a military area of coordination or any portion thereof" by the time the US returns control of the bases to the government of Panama. That means the US government must take action to remove buried chemical munitions from bases in Panama before the termination of the Treaty on December 31, 1999.

Irrespective of any attempt by the US Army South to define the problem of buried chemical munitions out of existence, the Canal Treaty and related implementing agreements impose stringent obligations to consult with the Panamanian government about environmental hazards and hazards to human life, health and safety and to remove any such munitions that pose a threat to human health, life and safety.

In addition to its obligations under the Canal Treaty, international law gives the United States affirmative obligations to protect the environment. The obligations derive from treaties, customary international law and general principles of international law. They begin with the obligation not to harm the environment of another state. Having failed to fulfill that duty, the United States must nonetheless comply with other international legal obligations. Thus the United States must gather and provide information concerning environmental hazards caused by its activities in Panama; it must consult and cooperate with the government of Panama in addressing those hazards; it must carry out environmental impact assessment; and it must facilitate public participation. The United States has not fulfilled these obligations either. US obligations also include the duty to clean up environmental hazards and to provide compensation for irremediable environmental damage. The unremedied, uncompensated contamination and environmental damage at US bases in Panama stands in flagrant opposition to these obligations.

The United States also appears to be in violation of international legal requirements that regulate particular types of environmental problems, such as hazardous wastes, and activities that endanger biological diversity. The failure of the United States to provide complete and accurate information about environmental conditions, however, makes it impossible to gauge the full scope of other violations.

The United States has also disregarded the substantial body of international law relating to protection of human rights and the environment, which lays out the rights of the Panamanian people and government, as well as obligations of the US government. The environmental problems associated with US military bases in Panama may violate a range of international human rights principles. Environmental contamination interferes with the right to a secure, healthy and ecologically sound environment, the right to life, the right to health, the right to personal security, the right to safe and healthy food and water, the right to safe and adequate housing, and the right to self-determination (including sovereignty over natural resources). The US government's apparent disregard for the rights of Panamanians, present and future, also suggests violations of the right to non-discrimination (including the right to environmental justice) and the rights of future generations to inherit a habitable environment. The US failure to provide meaningful opportunities for public participation in relevant decision making also implicates the right to environmental information and the right to participation.

The US government's refusal to clean up the bases prior to transfer and its denial of post-closure responsibility also violate the right to a remedy.

At non-stockpile chemical weapons sites across the United States, including sites of buried chemical munitions, the US government has been prepared not only to assess contamination left by chemical weapons activities, but to conduct clean-up of those sites. These are not technically impossible tasks. The United States can and should carry them out in Panama.

The CWC is a brand new legal instrument, whose driving force is the elimination of all chemical weapons. The United States, Panama, the private sector and ordinary states all will benefit from the Convention's success. In that spirit, the United States should avoid an overly technical application of the convention's provisions in favor of a forward-looking approach. It can do this by fully disclosing to the Government of Panama all information relating to sites where chemical munitions and agents, including duds, may have been abandoned, and by committing the resources necessary to safely and promptly dispose of chemical weapons and agents it abandoned in Panama, including San José Island as well as burial sites.

The government of Panama and the British and Canadian governments all have a role to play as well. The latter two countries should disclose to Panama documents on their chemical weapons activities there (particularly on San José Island), since both also participated in the San José Project, and both are also State Parties to the Chemical Weapons Convention. In addition, potential investors should support Panama's aspirations for a safe and healthy environment by investing in dignified work by Panamanians in the interoceanic region and by supporting Panamanian diplomatic efforts for decontamination of areas affected by past chemical warfare programs.

The United States has a unique historical opportunity to demonstrate its good faith and leadership in ridding the world of chemical weapons. It can take an exemplary step in exercising that leadership in Panama.