

TRADOC HISTORICAL RESEARCH REPORTS

**THE DIOXIN INCIDENT
AT FORT A. P. HILL
1984-1985**

by

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**Office of the Command Historian
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FOREWORD

This Research Report was prepared at the request of the Deputy Chief of Staff, Engineer, U.S. Army Training and Doctrine Command, to provide an accurate, documented historical account of the background and events leading up to the dioxin contamination incident of 1984-1985, involving the 1981 and 1985 Boy Scout Jamborees at Fort A. P. Hill, and the testing and cleanup measures undertaken by the Army in conjunction with the Environmental Protection Agency, the Boy Scouts of America, the Centers for Disease Control, and other agencies. The Report is based on primary sources in the file of the Office of the Deputy Chief of Staff, Engineer, Headquarters, U.S. Army Training and Doctrine Command as well as on author interviews.

As a documented account of the many aspects of the Fort A. P. Hill incident and cleanup-its background, surveys, soil sampling, protective measures taken, clean-up procedures, interagency coordination, press releases-this report provides a useful record of how one Army installation dealt responsibly with a potentially serious environmental contamination problem.

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CONTENTS

CONTENTS

Introduction	1
Origins of the Problems	1
Planning for Response	4
Remedial Phase	11
Conclusion	12
Notes	14
Enclosures	18
1. Fenced Area Containing Formerly Used Herbicide Storage Shed	18
2. Contaminated Area with Proposed Sampling Points	19
3. Contaminant Levels under Building 225	20
4. Contaminant Levels around Building 225	21
Chronological Record of Events	22
List of Acronyms	25
List of Appended Documents	26

CONTENTS

Introduction

The confirmation of residual dioxin contamination in and around Building No. 225, a former herbicide storage site at Fort A. P. Hill, Virginia, drew national attention in November 1984. Although the possibility of human exposure to dioxin contamination later turned out to be negligible, the incident generated for the U.S. Army an increased awareness of the environmental hazards of improperly stored herbicides. The Fort A. P. Hill contamination was of possible consequence, since the storage site stood adjacent to the area used by the Boy Scouts of America (BSA) for its main encampment site during the 1981 national Scout Jamboree. The BSA also was planning, in 1984, to use this site again for its 1985 Jamboree. The expansion of the Fort A.P. Hill dioxin incident from a matter of serious interest by the Federal Government to a cause of concern and anxiety in sectors of the general public resulted when the press communicated the situation nationwide before federal authorities had completed their testing to determine the extent of the contamination.

In January 1985, the verified results of testing, conducted by representatives of both the U.S. Environmental Protection Agency (EPA) and the BSA, confirmed that the residual dioxin contamination was not sufficient to pose a health hazard. With the extent of contamination determined, the Army immediately implemented remedial action. By late February 1985 Building 225 and the contaminated soil in its vicinity had been removed and safely stored for future destruction. The cost of decontaminating and disposing of the dioxin pollution at Fort A. P. Hill was approximately \$1.7 million.

The possibility of contamination at the former herbicide storage shed in the Mahone Area of Fort A. P. Hill had been identified as early as 1976. But there existed little familiarity with the characteristics of dioxin at that time, either in the military sector or the civilian sector. An important distinction must here be made between the awareness that had developed since the early 1970s in the nation at large about the potential environmental hazards posed by spillage of toxic and hazardous chemicals, and the universal lack of knowledge specifically about dioxin. That specific knowledge did not materialize until the early 1980s. When the particular problem of residual contamination and potential dioxin hazard at the Fort A.P. Hill site was identified, the Army responded responsibly and effectively.

Origins of the Problem

Throughout the 1960s the Land Management Branch of the Fort A. P. Hill Facilities Engineer (FE) Directorate, had used herbicides to clear fields of fire for weapons ranges and to eliminate competing undesirable hardwoods that inhibited the growth of neighboring pine trees. As early as 1962 various herbicides, including 2,4-D (2,4-Dichlorophenoxyacetic Acid), and 2,4,5-T (2,4,5-Trichlorophenoxyacetic Acid), were mixed and stored in the herbicide storage shed located in the Mahone area to support these defoliant operations. Although no records have survived to indicate exactly which areas of Fort A. P. Hill were treated, it is known that these herbicides were used throughout the reservation until 1968, when use of chemicals by FE personnel was dis-

continued. During the subsequent period until 1978, Fort A. P. Hill hired contractors to carry out the herbicide treatments, and these contractors supplied their own chemicals.¹ The unused FE herbicides, including the herbicide silvex 2,4,5-TP (2-(2,4,5-Trichlorophenoxy) propionic acid), were however retained, and were stored at the Building 225 site.

During the years following the change-over to contractor operations the surplus stored silvex slowly corroded its five-gallon metal containers, and the raw herbicide leaked onto the floor and through the spaces between the floor boards onto the ground. This was the situation in October 1976, when the United States Army Environmental Hygiene Agency (USAEHA) conducted an installation pest management survey. The audit was conducted to provide guidance and technical assistance on the adequacy, effectiveness, and efficiency of the Fort A. P. Hill pest management program. Among its findings, the USAEHA inspection team found the herbicide shed to be inadequate for the storage of herbicides, and found the 130 gallons of silvex stored in the shed to be a definite safety hazard, particularly since any movement of the five-gallon containers was likely to cause additional spillage. The USAEHA made the following recommendations:

Recontainerize the 130 gallons of 64 percent silvex and properly relabel the new containers . . . cover the herbicide contaminated floor board of the present herbicide storage facility with linoleum or other durable impermeable floor covering to prevent further contamination of personnel and stored materials until a suitable storage facility is obtained.²

The extent of contamination in the soil under the shed was not addressed by the USAEHA survey. In accordance with the USAEHA recommendations, correction of the deficiencies of the herbicide shed and its herbicide containers was completed in the summer of 1977.

Events of the following year acted to deflect attention away from the question of contamination of the site. Along with the increasing number of women entering the Army emerged a growing awareness of the hazardous effects of 2,4,5-T exposure for pregnant women (i.e. . . . as a cause of fetal malformations). The Army Training and Doctrine Command (TRADOC) at Fort Monroe, Va., which commanded Fort A. P. Hill as a sub-installation of the U.S. Army Quartermaster Center and Fort Lee, Va., consequently banned the use of such chemicals on all its installations. At the same time, the Fort A. P. Hill Land Management Branch was moved from its isolated location in the Mahone area and united with the other FE branch shops, some eight miles away, in order to improve the efficiency of its operations. As a result of these developments, the surplus, repacked herbicides stored in the herbicide storage shed were turned in to the Defense Property Disposal Office, and the shed was in 1978 vacated.³

In regard to the wider apprehension of dioxin as a serious environmental contaminant, public interest was aroused for the first time in 1980, when the entire town of Times Beach, Missouri, was declared contaminated by a form of this chemical. The Times Beach contaminant was TCDD (2,3,7,8-Tetrachlorodibenzo P-dioxin), a chlorinated hydro-carbon, which occurs as an impurity in 2,4,5-T and is a Teratogen (i.e., it causes

fetal malformation). The resultant resettlement of all Times Beach inhabitants for health and welfare reasons at a time when very little was known about the effects of the pollutant, led to considerable speculation as to what degree of peril was involved. While subsequent dioxin research by the U.S. Department of Health and Human Services Centers for Disease Control (CDC) led to a better understanding of the environmental hazard, much of the CDC information was not available in the fall of 1981 when contamination was to be first detected at the former herbicide storage shed site at Fort A. P. Hill. Thus the BSA Jamboree of 1981 came at a time when the hazardous characteristics of dioxin were only beginning to be appreciated.

In addition, when the BSA Jamboree assembled at Fort A. P. Hill in the summer of 1981, all local Army officials with any knowledge of the chemical spill at the former herbicide storage shed had been reassigned. No one in authority at the fort was aware of the potential danger present at the contamination site. Thus, there was no apparent reason to preclude the siting of a part of the BSA encampment directly adjacent to the enclosed site of the shed. While the building itself was used to store communications boxes, several Jamboree staff members were billeted outside the fence which surrounded the former herbicide storage facility (see enclosure 1). Constructed of Army tents equipped with plywood floors and cots, the Jamboree encampment facilities, however, made direct contact with the ground along the fence minimal.⁴

Six months after the Jamboree, in November 1981, the U.S. Army Toxic and Hazardous Materials Agency (USATHMA) conducted the first phase of an installation restoration program (IRP) at Fort A. P. Hill. This was an on site records search of past activities undertaken to identify storage or disposal areas and to "determine the existence of toxic and hazardous materials and related contamination."⁵ During the November 1981 USATHMA survey the 1976 USAEHA pest management survey was reviewed, and the possibility of contamination of the soil under and around Building 225 was officially identified for the first time (see enclosure 2). The USATHMA survey officials recommended that Fort A. P. Hill:

Conduct sampling and analysis of the soils which were beneath the former herbicide storage facility (near Bldg 0225, Mahone Area) to determine the extent of the Silvex contamination if any, and take appropriate action.⁶

The potential seriousness of the matter was not immediately appreciated, since the report itself was completed and provided to the commander at Fort A. P. Hill on 10 December 1982, thirteen months later. Shortly thereafter, on 28 March 1983, authorities at A. P. Hill requested that USAEHA conduct a sampling of contaminated materials. No official having authority to expedite the process was aware that the BSA had used the Building 225 area in 1981, and the possibility of contamination at the Fort A. P. Hill site, was not, in itself, seen as grounds for granting the installation a higher priority ranking than any other site where such testing was needed. Consequently, with USAEHA mission services fully committed for FY 1983, the Fort A. P. Hill staff requested that USAEHA conduct the sampling and analysis of the site of the former herbicide storage facility in the first quarter of FY 1984.⁷ For these reasons, it was in FY 1984, when the first sampling was carried out, that the seriousness of the problem was fully realized.

The original intent of the USAEHA sampling and analysis, which took place in March 1984, was to ascertain the presence of the phenoxy herbicides-silvex 2,4,5-TP; 2,4-D; and 2,4,5-T-only, since these were the chemicals known to have been stored in the shed. While silvex leakage had been previously documented, it was not a foregone conclusion that it or other spills had been *dioxin* leakage. Indeed, the USAEHA laboratory capability was sufficient only to detect the leaked chemicals' presence; the laboratory was not equipped to provide an answer as to the more complex issue of dioxin contamination. What the March 1984 sampling by USAEHA did was indicate the presence of silvex 2,4,5-TP; 2,4,5-T; and 2,4-D, and identify *potential* dioxin contamination of the site by the more toxic TCDD, which, it will be recalled, occurs as an impurity in 2,4,5-T. The resulting USAEHA report of 6 July 1984 recommended that:

Prior to removal and disposal of contaminated soil, (A. P. Hill should) take and analyze samples for dioxin content, specifically 2,3,7,8-TCDD and HCDD. Analyze samples of the wood flooring for dioxin along with the soil.⁸

Acting on the recommendation of the July 1984 USAEHA report, David F. Hoel, the Fort A. P. Hill Environmental Coordinator, soon thereafter sent composite samples to EPA-approved commercial laboratories to determine the presence of any dioxins under the building or downslope from it. On 26 October 1984, Hoel was informally alerted by one of the laboratories that dioxin contamination was in fact present in the samples analyzed in significant quantities, and that a written report, detailing the degree of contamination, would be mailed within a few days. Acting on this early notification, Hoel informed Colonel Herbert C. Distefano, the Fort A. P. Hill commander, of the dioxin contamination, and Distefano in turn reported this news to his superior, Maj. Gen. Eugene L. Stillions, Jr., the commander of the U. S. Army Quartermaster Center and Fort Lee. The situation was then communicated to the TRADOC Chief of Staff. As an early measure, Maj. Jay Craig, the Public Affairs Officer (PAO) at Fort Lee, was made aware of events and began to prepare for the contingency of overreaction by the media once the news of dioxin contamination was made public.⁹

Planning for Response

The entire phase of planning for response was complicated and overshadowed by rising popular concern, as the public became increasingly aware of the situation. The fact that the Boy Scouts had pitched tents in 1981 in the general vicinity of the herbicide storage shed, together with the uncertainty as to the degree of contamination, understandably caused the parents of the 1981 Jamboree scouts to await results anxiously. At the same time, the BSA leadership, concerned as well with the future of the 1985 Jamboree (approximately 35,000 scouts were scheduled to attend),¹⁰ was eager to know if the contamination would force the Jamboree's cancellation or relocation, either of which could result in a considerable loss of funds in contracts for transportation, tours, equipment, and/or promotion of the quadrennial event. The results of comprehensive testing, which became known in the middle of January 1985, led to corrective measures, bringing to an end the emotionally-charged situation.

Unfortunately for all concerned parties, during the planning-for-response phase, and before the authorities had ascertained the minimal extent of the contamination, the public was introduced to the still incomplete story. The Richmond (Va.) *Times Dispatch* had early become aware of the efforts under way at Fort A. P. Hill and on 22 October filed a request to Aberdeen Proving Ground under the Freedom of Information Act for a copy of the USATHMA Phase I Installation Restoration Program Report issued in December 1982.¹¹ The story broke on 8 and 9 November. On 8 November, Tracy Lyons, a reporter for *USA Today* and Gannett TV News Syndicate, contacted the office of the Fort Lee PAO, Major Craig, about "A. P. Hill and pollution." After gaining approval from the TRADOC and Department of the Army PAOs, Major Craig got in touch with Ms. Lyons. He confirmed that there appeared to be a contamination problem at Fort A. P. Hill and that he was working on obtaining the full story for release to the media. By the conclusion of this conversation, Craig had taken ten questions from Lyons to be answered.¹²

Under TRADOC, the primary responsibility for directing the response to the Fort A. P. Hill dioxin incident rested from the beginning with the Fort Lee commander. To return to the period 29 October through 5 November 1984, Maj. Gen. Stillions and his Chief of Staff, Colonel Thomas A. Banner, met with Colonel Distefano and Fort Lee staff representatives from the Staff Judge Advocate (SJA), the Facilities Engineer of the Directorate of Engineering and Housing (DEH), and the PAO to discuss the problem and to develop plans of action. Since written results of the initial tests for dioxin contamination were not yet available, the staff was instructed to avoid releasing any information about the incident, but to respond as they best could with the facts at hand. Maj. Gen. Stillions directed the DEH to determine the method of funding for the projected cleanup and to establish preliminary milestones for the notification of other military and civilian headquarters and agencies. "Question and Answer Responses" were prepared by the PAO for as many media questions as could be anticipated, along with a draft news release, using those facts thus far obtainable. These PAO documents were then provided to Headquarters, TRADOC and then to the Department of the Army for review. By the time the story would break on 8-9 November, the Department of the Army, TRADOC, and Fort Lee possessed informed answers to all the questions presented to them, with two exceptions. Those two questions were the effect of the dioxin contamination on the Scouts of the 1981 Jamboree, and the extent of the contamination. The several Army headquarters were also in agreement that the Fort Lee PAO would be the principal spokesman to answer all queries about the dioxin incident.¹³

A main concern of Maj. Gen. Stillions with regard to the public relations aspect of the incident was that no perception should arise that his command was trying to cover up or hide a serious problem:

Bad news does not improve with age . . . So PAO get all the facts together and prepare something we can hold for release should the media call. I want to get the whole story out in the open as soon as possible, but we need to give them the complete story after we have let the Army, BSA, EPA, and Commonwealth of Virginia know the facts.¹⁴

While keeping the media correctly and expeditiously informed as the hard facts materialized, it was the challenge and main function of the Fort Lee PAO to deal with public perceptions. Fort Lee's approach was that the best antidote to unreasoned fear was the dissemination of as many facts as were known at the earliest feasible time.

The Fort Lee authorities began without delay to formulate a plan of action to control the situation and to clean up the contamination at the Fort A. P. Hill site as rapidly as possible. Since the A. P. Hill staff was too small to handle such a large effort and Fort Lee exercised command authority over Fort A. P. Hill as a subinstallation, Maj. Gen. Stillions directed the Fort Lee staff to coordinate all the major support activities for the effort while the Fort A. P. Hill staff managed the actual on-site operations. The TRADOC headquarters staff lent assistance to Fort Lee to expedite the process. At Fort Lee, direction, planning, and programming for the effort relied on standard military command and staff procedures. No special task force was formed. All staff sections at Fort Lee and the Fort A. P. Hill commander were considered part of the administrative team to assist, advise, and implement actions as required.

Fort Lee's strategy for dealing with the A. P. Hill problem was based on four major moves: (1) gain outside funding, since the project exceeded the funding capability of the command; (2) meet any negative perceptions that arose within the media or the general public by presenting as many facts as were known as soon as possible; (3) notify, and keep informed, higher headquarters in the Department of the Army and the Department of Defense as well as affected nonmilitary agencies, including the Environmental Protection Agency (EPA) and the Commonwealth of Virginia, in such a way that they would not overreact; and (4) clean up the dioxin spill as quickly as possible. Essential above all else in this plan of action was the need for more concrete facts, particularly a determination of the degree and extent of the site contamination, before informing the media.¹⁵ In the meantime, Fort A. P. Hill initiated precautionary physical measures by extending the compound fence to surround the known area of contamination downhill from Building 225 and posting warning signs. It was also at this point that the Fort Lee staff, while concurrently planning for the upcoming 1985 Jamboree at A. P. Hill, realized for the first time the potential danger to the 31,000 Scouts who had attended the 1981 Jamboree.¹⁶

On 5 November 1984, written results from the first commercial laboratory to report were received by Fort Lee on the initial Fort A. P. Hill samples. The results revealed that the soil under Building 225 contained 228 parts per billion (ppb) of dioxin residue and that the soil downslope, but outside the fenced area of Building 225, contained 3.2 ppb. (A rating of 1.0 ppb was the acceptable risk level established by CDC and the EPA). With official data in hand on the degree of contamination, Fort Lee now began to conduct briefings to inform the Army chain of command and affected nonmilitary agencies—the BSA, EPA, and Commonwealth of Virginia—of the contamination and to assist the Fort Lee staff in initiating a formal plan of action.¹⁷

On 6 November 1984, Mr. Pat Hillier, Assistant Secretary of the Army (Installations, Logistics and Financial Management), was briefed together with representatives of Headquarters, Department of the Army, by representatives of Fort Lee and Fort A. P.

Hill. During the meeting Mr. Hillier directed that actions be taken quickly and decisively-first to identify, and then to clean up, the dioxin contamination; media releases would not be made until the boundaries of the contaminated area were identified.¹⁸

On 8 November, the Department of the Army, together with Fort Lee, held a meeting with the EPA and representatives of the Commonwealth of Virginia to map out a plan of sampling and also to discuss cleanup preparations. The EPA recommended that the CDC review all test results and sampling/follow-on cleanup plans before their use in order to insure no health risks to exposed personnel. This review was to be completed during the week of 13-16 November. It was also determined that Department of Defense "superfund" money, not TRADOC funds, would be used to support the cleanup expense, and EPA agreed to provide technical assistance as required.¹⁹

On 9 November 1984 representatives of the BSA were informed and advised of federal action to correct the problem. As a result of this meeting, the BSA coordinated its own participation in the sampling process through a BSA-selected contractor. The Guy and Davis Consulting Engineers firm was hired for this purpose on the following day.²⁰ In addition, BSA further communicated its concerns regarding the 1985 Jamboree to its Scout Troops.

To summarize, by 9 November 1984, the Army was developing a sampling plan with EPA, the Commonwealth of Virginia, BSA, and CDC to determine the extent and degree of contamination. Once this planning was completed, sampling would begin immediately. It was estimated that the results would be available within thirty to sixty days. With the extent of contamination established, the media could be fully informed and a complete cleanup could then be carried through. Meanwhile, also on 8 November, a camera man from Gannett TV, Kyle Eppler, arrived at Fort A. P. Hill and was permitted to film the Scout amphitheater and its sign, "1981 BOY SCOUT JAMBOREE, Constructed by the 76th Engineer Brigade," before departing.²¹

Using the preformulated "question and answer responses," the Fort Lee PAO, Major Craig, passed the answers to reporter Lyons' questions to Headquarters, TRADOC, who conveyed them to Headquarters, Department of the Army for release approval. A summary of the Department of the Army approved release, relayed to Major Craig at Fort Lee on 8 November, follows:

The BSA had only informal notification; dioxin was a byproduct of the herbicides used; the suspected contamination was believed to be contained within the Fort A.P. Hill boundaries; preliminary findings indicate concentrations which were not high enough to present a health hazard; a short history of the herbicide leakage up to 8 November; EPA had been notified; once the scope of the problem was ascertained (the size of the involved area), the contamination would be cleaned up immediately.

Ms. Lyons was then briefed on these findings. Because the Army did not yet have a complete account, however, the reporter agreed to hold the story until the BSA had been officially informed, and longer if need be.²²

On 9 November, reporter Dianne Walker of *TV-12*, the Richmond affiliate of NBC, also called for information regarding dioxin at Fort A. P. Hill. Major Craig responded with the same information he had provided to *USA Today* and personally escorted the camera crews of both *TV-12* and *USA Today* to film Building 225. The station manager of *TV-12* determined not to delay the story pending more information and decided to release it on that day's "6 O'Clock News." Fort Lee, as a professional courtesy, then informed *USA Today* to go ahead with its report.

The Army reiterated throughout all its channels at this point that the Fort Lee PAO was to be the principal spokesman for the A. P. Hill dioxin queries. All new queries were to be directed to Major Craig first.²³ Fort Lee intended that all media elements would get equal and similar responses to avoid contradictory information or complaints of favoritism.

Fort Lee's exercise of caution could not prevent the generation of contradictory and erroneous reports, as reporters, pursuing other routes in their attempt to obtain more concrete information on the yet unanswered questions, sought out members of the medical profession for their opinions on dioxin effects. As they developed their stories, elements of the media began to play the Army's responses against the views of other agencies and against professional opinion in order to excite public curiosity about the story. Nation-wide interest intensified when Dr. Barry H. Rumsach of the Poison Control Center (PCC) in Denver, Colo., briefed press representatives concerning the dangers of dioxin, recommending that those Boy Scouts who had attended the 1981 Jamboree be examined for its effects.²⁴ Thereafter, it became of paramount importance in the public relations aspect of the incident at Fort A. P. Hill that government and nongovernment agencies continually coordinate the release of the information they had in order to insure that the press was provided the same story by all. Once the Fort Lee PAO had been established as the media conduit, a conflict in information which would have led to the still further confusion of the general public was avoided.

On 10 November 1984, to allay fears arising from partially informed or alarmist projections of dioxin exposure to the 1981 BSA campers, the Army held a press conference. Preceded by Fort Lee's extensive press advance, which answered most conceivable questions, the conference had the effect of toning down subsequent releases by the press. Nonetheless, concern by Scout parents remained understandably high, and in response the Assistant Secretary of the Army (Installations, Logistics and Financial Management) and the Commander, Fort Lee, set up the Fort A. P. Hill Information Center on 16 November 1984 to respond to any further questions regarding the dioxin contamination. Besides its effort to answer questions about either the 1981 or the 1985 BSA Jamboree, the A. P. Hill Center also sent out information packets on request. The packets were prepared by the Army Surgeon General's Office, the Public Affairs Office, and CDC, the latter providing further detailed information.²⁵ Although these efforts were significant in ameliorating public concern, a full climate of assurance did not develop until the results of the comprehensive testing became known two months later in January 1985 and established that the 1981 Jamboree attendees camped in the vicinity of Building 225 had not been exposed in any harmful degree.

Preparations for the comprehensive sampling and monitoring at the Building 225 site were accomplished in record time. As early as 15 November 1984, a meeting held at Aberdeen Proving Ground, Md., between representatives of CDC, EPA, the Commonwealth of Virginia, the BSA contractor (Guy & Davis Engineers), HQ TRADOC, Fort Lee, Fort A. P. Hill, and USAEHA, generated a draft sampling plan. By 23 November, a revised plan had been staffed with a field sampling start date established at 27 November.²⁶

As provided for by the November 1984 plan, EPA accepted the responsibility of using its contractors to collect some 400 samples in and around Building 225, to include specimens from drinking water wells, lakes, and planned 1985 BSA camp sites in the vicinity. The sampling points were first to be surveyed and staked, then either surface or core samples would be extracted. From the identified locations all core-type samples obtained by the EPA contractor would be cut in either six-inch or one-foot segments. These samples were to be compared with those collected by the BSA contractor. In some cases, hand augers would be used. Surface samples were defined as four-inch composites or dust samples (i.e., from the floors and walls of Building 225).

To supplement this plan, USAEHA agreed to install shallow ground-water monitoring wells outside the contaminated zone, once its boundaries had been determined. For this action, a separate groundwater monitoring plan was developed to provide for the detection of potential groundwater contamination.²⁷ By 14 December 1984 a draft of the groundwater monitoring plan had been circulated, and by 7 January 1985, a final version was published permitting USAEHA to proceed as planned and drill the monitoring wells during the week of 7-18 January 1985.²⁸ The plan called for six monitoring wells to be constructed in a circle with a radius of 215 feet from the center of Building 225. The wells were drilled to a depth of 40 feet using a 6-inch hollow-stem auger, placing the bottom of each well approximately 15 feet below the water table. It was felt that these plans, through their combined implementation, would provide the most accurate detection.

The EPA representatives began sampling on 27 November 1984; some sampling team members were veterans of the Times Beach cleanup. On 19 November, the Army held a press conference at Fort A. P. Hill within viewing distance of the sampling activities, to update the media on the combined ongoing cleanup action. Upon extraction, samples were immediately sent to contracted laboratories, with turn-around times of from 15 to 30 days.²⁹ Altogether about 540 samples were taken before the team demobilized on 6 December 1984: 142 from Boy Scout activity areas; 29 from the drinking water; 38 from areas adjacent to, and 164 from within the fenced area of, Building 225; 21 from areas where the herbicide had been used prior to 1978; and approximately 150 from lakes and other areas of interest.

In the meantime at Fort Lee, a coordination meeting was held on 21 November 1984 to formalize specific tasking actions for the cleanup phase. Representatives from HQ TRADOC, Fort A. P. Hill, and the Fort Lee Installation staff were present. As of 20 November TRADOC confirmed that Fort Lee would continue to direct the response to the dioxin incident and appointed Maj. Gen. Stillions as the Executive Agent to coordinate on-site cleanup efforts. The Quartermaster Center completed its action plan for the dioxin cleanup operation on 10 December.³⁰

As announced at the 21 November 1984 meeting, funding was to be allotted to the various proponent agencies by transferring \$1,500,000 of DOD superfund monies from TRADOC to Fort Lee. TRADOC, Fort Lee, and EPA were to develop not later than 5 December, an interservice support agreement (ISSA) to transfer the needed funds and facilitate more effective cooperation between the Army and EPA.³¹

In regard to the cleanup operation, EPA accepted responsibility at the 21 November 1984 meeting for the physical cleanup. EPA announced that it was assembling teams from personnel in EPA Region VII who had participated in the Times Beach decontamination effort. The on-site coordinator, detailed by the Army's Baltimore District Engineer, was, by request of Fort A. P. Hill, to report directly through that installation's chain of command during the cleanup phase. The test results from the samples taken between 27 November and 6 December were to be made available to EPA by 21 December to allow sufficient time for the design of the cleanup plan. The Fort Lee meeting established that the cleanup would start not later than 17 January and be completed by 27 February 1985.³²

As part of the cleanup design, EPA signed a contract with the Weston-Sper Co. for a feasibility study to help determine the best course of action. The sampling results that were received by 21 December showed that dioxin contamination existed only under Building 225 and within its fenced area and a small drainage area just outside the fence (see enclosures 3 and 4). Although the samples still had to be reviewed by CDC for accuracy, the EPA used these preliminary results to establish eight alternatives to deal with the contamination problem.

The first four alternatives called for leaving the contaminated area intact, and either taking no remedial action, capping the area with an impermeable layer, or decontaminating the site in place. The last four alternatives recommended the excavation of all contaminated materials, with various destruction or storage options.³³ Alternative 8 was chosen by EPA as the most feasible, since it required excavation of contaminated materials and interim storage on Fort A. P. Hill. The likelihood of finding another agency willing to accept dioxin contaminated materials was considered remote and far more expensive. All agencies concerned approved the EPA proposal, and EPA completed a clean-up design during the third week of January 1985 based on Alternative 8.

By the middle of January 1985, both the USAEHA (through its ground water monitoring) and the CDC (through quality assurance and quality control evaluations of EPA's analytical results) concluded the following. The Fort A. P. Hill dioxin contamination was limited to Building 225 and its immediate surroundings. Essentially no contamination was found in the living or activity areas used by the BSA during the 1981 Jamboree. Further, because of the confined area of the dioxin (TCDD) contamination, successful clean-up of the site, which bordered on the designated 1985 Boy Scout Jamboree site, could be accomplished. It was subsequently determined by the CDC and by the Menninger Foundation (whose assistance the BSA had requested) that none of the Scouts and none of the BSA staff required physical examinations for dioxin exposure, since any camper would have had to consume substantial quantities of soil to have been affected by the limited concentrations of dioxin found.³⁴

Meanwhile, the BSA, having witnessed an increase in cancellations for the 1985 Jamboree since the beginning of January, pressured the CDC and EPA to immediately inform the public of their findings. In an effort to curb further cancellations, the planned clean-up mobilization date was consequently moved back to 22 January 1985; the date change would give the BSA time to review the test results and issue a press release concerning its decision to hold or to cancel the Jamboree. On 17 January 1985 the BSA held a press conference releasing the recommendations of the Menninger Foundation and CDC and announcing plans to return to Fort A. P. Hill for the 1985 National Jamboree following the now soon-to-occur dioxin contamination clean-up. The Army, in coordination with EPA and CDC, followed with a press conference on 23 January validating the BSA release and disclosing the plans for clean-up.³⁵

Preparations for the remedial action were now completed. The public had been reassured that the contamination had produced no health risk to the Boy Scouts of the 1981 Jamboree, and the BSA was confident that the 1985 Jamboree would be conducted as planned. On 21 January 1985 an EPA contractor mobilized at Fort A. P. Hill to remove all the contaminated materials.

Remedial Phase

The clean-up design called for demolishing Building 225 and removing it together with all contaminated soil and debris to reduce the on-site detectable level to no more than a 0.2 parts per billion concentration of dioxin. The excavated material was to be placed into U.S. Department of Transportation approved double containers (35-gallon fiber containers placed inside 55-gallon steel drums), and stored on Fort A. P. Hill within an EPA approved storage facility until an approved disposal mechanism could be identified. By plan, the waste would be destroyed by incineration. To assure all contaminated soil and building debris were removed, a mobile laboratory was on-site to analyze samples from the clean-up activities. Altogether, 475 samples were analyzed for this purpose.

During the period 22 January through 22 February 1985, the process of clean-up just outlined was basically completed. Altogether, 1,141 35-gallon drums of dioxin contaminated materials were removed from the site. These containers were then overpacked in 55-gallon drums and stored on a concrete pad within the fenced-in Facilities Engineer complex at Fort A. P. Hill, pending the construction of a separate storage building at Fort A. P. Hill (which was completed in June 1985). Through this process, the dioxin contaminated soil remaining on the site had been decreased to a detectable level of 0.1 parts per billion of contamination.

Estimated costs for the decontamination at Fort A. P. Hill, when the cleanup teams demobilized in late February 1985, were as follows:

\$ 350,000	-	Sampling Surveys
\$ 950,000	-	Clean-up
\$ 303,000	-	Storage
\$ 102,000	-	Government In-house expense
<u>\$1,705,000</u>	-	Total

Subsequent surveys in March and April 1985 confirmed that, for all practical purposes, the contamination had been eliminated.³⁶

Conclusion

The actions taken by the Army in response to the dioxin contamination at Fort A. P. Hill can serve as guidance in the resolution of similar environmental incidents in the future. A major lesson of the Fort A. P. Hill incident is that actions taken in response should from the beginning be under the control of the lowest level of command equipped with a staff adequate for the task. In order to avoid uninformed reaction or inadvertent overreaction by higher military and civilian authorities, the local commander must at once take charge of the situation and immediately provide his chain of command with the basic and most germane facts available. Such action insures that the local commander will receive the full confidence and assistance from his superiors that he needs as he formulates plans of action and coordinates with other military and nonmilitary agencies to resolve the problem. Local commanders will probably find normal command and staff procedures adequate and reliable for the management of such incidents, as did the commander of the U.S. Army Quartermaster Center and Fort Lee.

The Public Affairs Officer at the local level needs to amass the most pertinent facts about the situation as rapidly as possible. He should release to the media the full story as soon as it is complete. The PAO must be prepared to deal with media emotionalism based on a partial acquaintance with the facts and before a conclusive account of the incident has been compiled. In this way negative perceptions by the general public may be prevented from arising. Above all, responsible Army officials must act with an openness regarding the facts at hand that will prevent the perception of a cover-up of the environmental incident. These major lessons of the Army response to the dioxin contamination incident at Fort A. P. Hill serve as guidelines to the resolution of future highly charged environmental contingencies.

The dioxin incident at Fort A. P. Hill should be viewed by U.S. Army installation commanders as a significant educational experience. The sequence of events leading up to the November 1984 confirmation of dioxin contamination at Fort A. P. Hill was part of a larger learning process experienced by the entire nation. During the 1970s and early 1980s, popular concern about the potential risks of certain agricultural and industrial chemicals and wastes matured into a realization that some of those substances, used or released randomly or carelessly, could pose serious health hazards and could have significant harmful effects on the surrounding environment. Though the tests at Fort A. P.

Hill revealed minimal contamination and no harmful effects, the potential for exposure of the Boy Scout campers to the hazards of dioxin contamination was a matter for serious reflection.

In addition, although the Fort A. P. Hill incident turned out to be a hollow problem, a sum of \$1.7 million was invested to correct a deficiency that might have been avoided by more effective control of herbicide storage and handling, or by compilation and preservation of a written historical record of the relevant Fort A. P. Hill operations. Unfortunately, in the early 1980s too little knowledge was available in both the civilian and military sectors concerning the potentially serious environmental hazards of dioxin contamination.

The lessons of the Fort A. P. Hill incident suggest that continued steady attention to environmental programs and reports, past and present, is imperative if other such incidents are to be avoided. Past experience must be turned to use to improve future methods of environmental protection. Deterrent and readiness measures should be maintained, such as: improved methods to identify and correct deficiencies in storage, past and present, and in handling, before such deficiencies develop into problems; the education of newly assigned responsible installation personnel in the prevention of chemical contamination; and the keeping and maintaining of a permanent, documented installation historical record of the use, storage, handling, and disposal of toxic and other dangerous chemicals. Only through continued aggressive management and records preservation can situations such as that which occurred at Fort A. P. Hill be avoided in the future.

NOTES

¹(1) Army News Release—Dioxin at A. P. Hill (10 Nov 84). (2) Author interview with Lt. Col Jimmy Young, Office of Deputy Chief of Staff, Engineer, HQ USA TRADOC, 30 Apr 1985.

²Installation Pest Management Program Survey No. 61-0501-77, USAEHA, 26-29 October 1976, 8 Jun 77, Doc 1.

³Seminar, Residuals Management Technology, Inc., 20 Feb 85, subj: Environmental Auditing Seminar for TRADOC: Dioxin Contamination at Fort A. P. Hill, Va.

⁴Ltr, Lewis D. Walker, Deputy for Environment, Safety, and Occupational Health, Department of the Army, Office of the Assistant Secretary (I&L) to parents of scouts, 16 Nov 84, subj: Information for Parents of Scouts and Fort A. P. Hill Visitors, Doc 2.

⁵Ltr DRXTH-AS, Andrew W. Anderson, Ch, Assess Div, USATHMA to Cdr, Fort A. P. Hill, 10 Dec 82, subj: Installation Assessment of Fort A. P. Hill, VA, Report No. 316C, Doc 3.

⁶ibid.

⁷(1) Seminar, Residual Management Technology, Inc., 20 Feb 85, subj: Environmental Auditing Seminar for TRADOC: Dioxin Contamination at Fort A. P. Hill, VA. (2) Army News Release—Dioxin at A. P. Hill (10 Nov 84). (3) Ltr ATZM-FHE-E, Bruce L. Hopkins, DAC, Exec Asst, HQ USA Garrison, Fort A. P. Hill to Cdr TRADOC, 10 Jun 83, subj: US Army Environmental Hygiene Agency (AEHA) Mission Services, FY 84.

⁸Ltr HSHB-ES-H, Lt Col James M. Stratta, Actg Dir, Envir Quality, USAEHA to Cdr, USA TRADOC, 6 Jul 84, subj: Phase I, Hazardous Waste Management Consultation No. 37-26-0362-84, Investigation of Possible Herbicide Contamination In and Around Building 225, Fort A. P. Hill, Virginia, 12 March 1984, Doc 4.

⁹(1) Author interview with David F. Hoel, Department of Energy, Office of NEPA, Project Assistance EH25, 6 May 1987. (2) PAO Case Study (Dioxin), US Army Quartermaster Center and Ft Lee, n.d.

¹⁰PAO Case Study (Dioxin), HQ, US Army Quartermaster Center and Ft. Lee, n.d.

¹¹Ltr, Col Peter D. Hidalgo, Cdr USATHMA to Mr William Ruberry, Richmond Times-Dispatch, 9 Nov 84 (subj: Freedom of Information Act Request for Fort A. P. Hill USATHMA Phase I Installation Restoration Program Report).

¹²These questions were:

(1) Where is the two o'clock meeting (8 November) with the folks from EPA?

- (2) What is the source of contamination?
- (3) Have the Boy Scouts been notified, and when?
- (4) Is anyone in danger as a result of the contamination?
- (5) When was the contamination discovered, and who discovered it?
- (6) What were the herbicides used for?
- (7) Has USATHMA been notified?
- (8) Aberdeen did some initial tests but did not take samples? Was this forwarded to EPA, and do they know?
- (9) Aberdeen (Andy Anderson, USATHMA) says last review was in 82. What has been done since that time?
- (10) What does the Army plan to do about the problem?

¹³ Author interview with Maj Gen Stillions and Col Banner.

¹⁴(1) *Ibid.* (2) Quotation from PAO Case Study (Dioxin), HQ, US Army Quartermaster Center and Ft Lee, n.d.

¹⁵(1) Author interview with Maj Gen Eugene L. Stillions, Jr., and Col Thomas A. Banner, Commander and Chief of Staff, US Army Quartermaster Center and Ft Lee, 6 May 87. (2) Memo ATPA, Col Thomas P. Garigan, Chief of Public Affairs, HQ USATRADO, to Lt Col Jewel, Asst Ch of Staff, 9 Nov 84, subj: Ft A. P. Hill Contaminated Soil.

¹⁶ PAO Case Study (Dioxin), HQ, US Army Quartermaster Center and Ft Lee, n.d.

¹⁷(1) Ltr, OASA (I & L) to parents of Scouts, 16 Nov 84, Doc 2. (2) Seminar, Residual Management Technology, Inc., 20 Feb 85, subj: Environmental Auditing Seminar for TRADO: Dioxin Contamination at Fort A. P. Hill, Va. (3) PAO Case Study (Dioxin), HQ US Army Quartermaster Center and Ft Lee, n.d.

¹⁸ Fact Sheet DCSENGR/ATEN-FN, HQ USATRADO, 7 Nov 84, subj: Briefing on Fort A. P. Hill Dioxin Contamination.

¹⁹(1) Fact Sheet, DCSENGR/ATEN-FN, 9 Nov 84, subj: Reported Dioxin Contamination, Ft A. P. Hill (2) Fact Sheet, DCSENGR/ATEN-FN, 9 Nov 84, subj: Status of Dioxin Contamination at Fort A. P. Hill (3) Msg, HQ DA DAEN-ZCE/DAEN-ZCF to Cdr TRADO, 132025Z Nov 84, subj: Expedited Clean-up of Dioxin Contamination at Ft A. P. Hill, Virginia, Doc 5.

²⁰Ltr, Joe F. Banks, Dir, Engineer Service, BSA to Lt Gen E. R. Heiberg, III, Cdr/Ch of Engr, 5 Dec 84, w/incl: Lewis and Guy Rept for Dec 4, 1984 Meeting; and Sampling Plan for the BSA to Determine Extent of 2,3,7,8-TCDD Contam in and around Bldg 225 at Fort A. P. Hill, Va., prep by Guy and Davis, Consulting Engineers, 27 Nov 84, Doc 6.

²¹Memo ATZM-PAO, Maj Jay Craig, PAO, Ft. Lee, n.d., subj: Dioxin and News Media.

²²Ibid.

²³Asst Sec Army Hillier had talked with the USA Today reporter, Tracy Lyons, at his Pentagon office after the meeting with the BSA on 9 Nov 84. Thereafter, all media release was coordinated with Fort Lee first for accuracy and consistency. See Memo ATPA, Col Thomas P. Garigan, Chief of Public Affairs, HQ USATRADO to Lt Col Jewel, Assistant Chief of Staff, 9 Nov 84, subj: Ft. A. P. Hill Contaminated Soil.

²⁴(1) Seminar, Residual Management Technology, Inc., 20 Feb 85, subj: Environmental Auditing Seminar for TRADOC: Dioxin Contamination at Ft A. P. Hill, Va. (2) Daily Press, Newport News, Va., 11 Nov 84, "Dioxin Removal Pledged."

²⁵(1) The Times Herald, Newport News, Va, 12 Nov 84. (2) Fact Sheet, DAENZCE 21 Nov 84, subj: Ft A. P. Hill Information Center. (3) Ltr, OASA (I&L) to parents of Scouts, 16 Nov 84, Doc 2. (4) Army News Release-Dioxin at A. P. Hill (10 Nov 84).

²⁶Ltr HSHB-ES-H, Col Karl J. Daubel, Dir, Environmental Quality, USAEHA, to Cdr USATRADO, 11 Dec 84, subj: Hazardous Waste Consultation No. 37-26-1376-85, Final Sampling Plan to Define Extent of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) Contamination at Ft A. P. Hill, Va., Doc 7.

²⁷Ltr HSHB-ES-G, Col Karl S. Daubel, Dir Environmental Quality, USAEHA, to Cdr USATRADO, 7 Jan 85, subj: Revised Plan for Ground-Water Monitoring Around Building 225, Ft A. P. Hill, Virginia (Ground-Water Consultation No. 37-26-1376-85), w/incl, Revised Plan, Doc 8.

²⁸Msg, Cdr USAEHA to Cdr Ft A. P. Hill, 211900Z Dec 84, subj: Hazardous Waste Consultation No. 37-26-1376-85.

²⁹POLREP #1 through 10, USAEHA, 27 Nov 84 to 6 Dec 84, subj: Ft A. P. Hill Dioxin Site, Bowling Green, Va.

³⁰Action Plan, Dioxin Cleanup, Fort A. P. Hill, USA Quartermaster Center and Ft Lee, Va., 10 Dec 84, Doc 9.

³¹This "Compliance Agreement" between the EPA and the U.S. Army was completed by 18 January 1985. In addition, through an Interagency Agreement (EPA Form 1610-1), dated 9 Jan 85, the U.S. Army transferred \$1,000,000 to the EPA to cover obligations incurred in providing assistance to the Department of Defense, U.S. Army; this was in turn supplemented by an additional \$500,000 before the end of the month. See: (1) Federal Facility Compliance Agreement, between U.S. Army

and EPA, 17 January 1985, subj: Compliance Agreement in matter of A. P. Hill Contamination. (2) EPA Form 1610-1, Interagency Agreement, EPA and DOD (USA Quartermaster Center, Ft Lee, Va.), Emergency Response at Fort A. P. Hill, Bowling Green, Va., s/EPA, 7 Jan 85; US Army, 9 Jan 85, Doc 10. (3) EPA Form 1610-1, Interagency Agreement (Amendment), EPA and DOD (USA Quartermaster Center, Ft Lee, Va.), SAB, Doc 11.

³²(1) Fact Sheet, DCSENGR/ATEN-FN, HQ USATRADO, 4 Dec 84, subj: Dioxin Contamination at Fort A. P. Hill. (2) Memorandum ATEN-F, Col Joseph W. Stewart, Dir, Facilities Engineering, ODCSENGR, HQ USATRADO, to distr, 3 Dec 84, subj: Coordination Meeting, Dioxin Cleanup, Fort A. P. Hill.

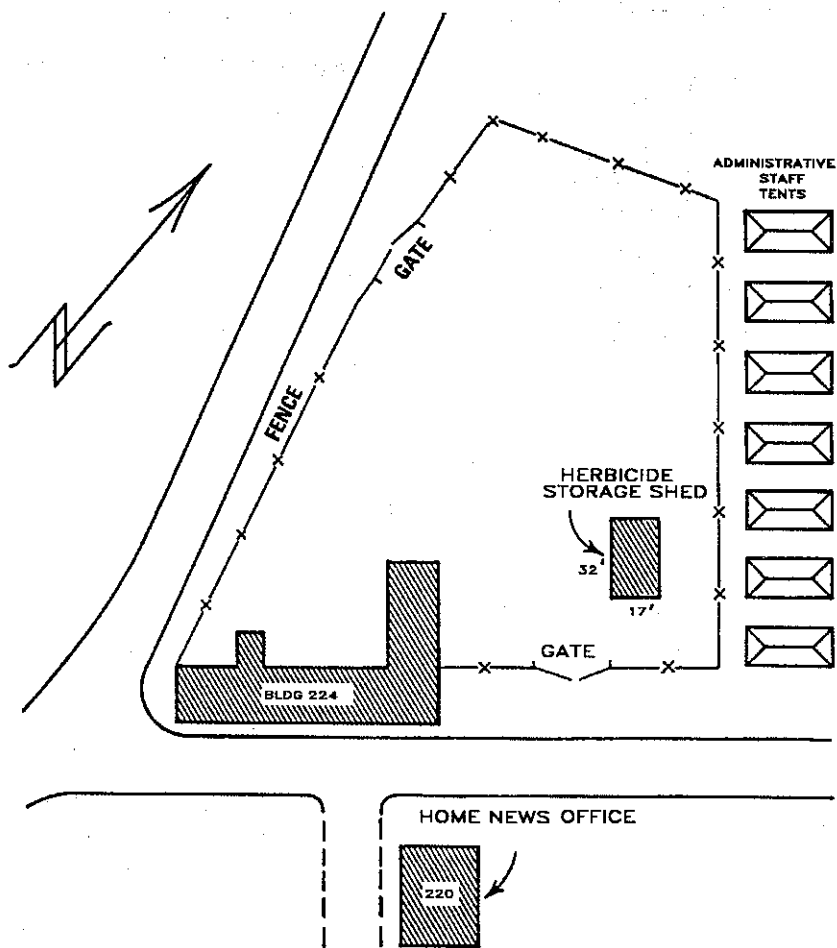
³³Feasibility Study, Weston-Sper, subj: Dioxin Contamination at Fort A. P. Hill, Virginia, 31 Dec 84, Doc 12.

³⁴(1) Ltr, Stephen Margolis, Envir Health Mgr, Chronic Diseases Div, Cen for Envir Health, CDC to Mr. Ralph Jordan, BSA, 15 Jan 85, Doc 13. (2) Ltr, Margolis, CDC to Dr. Walter F. Lee, EPA Region III, 15 Jan 85, Doc 14. (3) Statement, the Menninger Foundation, W. Walter Menninger, M.D., Chrmn National Health and Safety, BSA (recommendation regarding dioxin contamination at Fort A. P. Hill), Doc 15. (4) Information Paper DASG-PSP-O, 8 Nov 84, subj: Health Effects of Prospective-Potential Dioxin Exposure at Fort A. P. Hill, Doc 16.

³⁵(1) Fact Sheets ODCSENGR, HQ USATRADO advising the Command Group and Chief of Staff on dioxin cleanup events, 3 Jan 85, Bfg on Fort A. P. Hill Dioxin Contam; 9 Jan 85, EPA bfg on Fort A. P. Hill Dioxin Contam; 11 Jan 85, Status of Dioxin and Hazardous Waste and DDT Clean-up at Fort A. P. Hill; and 21 Jan 85, Dioxin and DDT Cleanup. (2) Msg, HQDA ESOH-SAIL to HQDA DAEN-ZCA, 142121Z Jan 85, subj: Dioxin Cleanup-Fort A. P. Hill, Va. (3) News Release, BSA, Public Relations, 17 Jan 85, subj: No Health Hazard at Jamboree, Boy Scouts Say, Doc 17. (4) Statement, Stephen R. Wassersug, Dir, Hazardous Waste Management Div, USEPA, Region III, (23 Jan 85, subj: Extent of contamination at Fort A. P. Hill), Doc 18. (5) News Release, Public Affairs Ofc, USAQM Cen, Fort Lee, Va., (23 Jan 85, subj: extent of contamination at A. P. Hill), Doc 19.

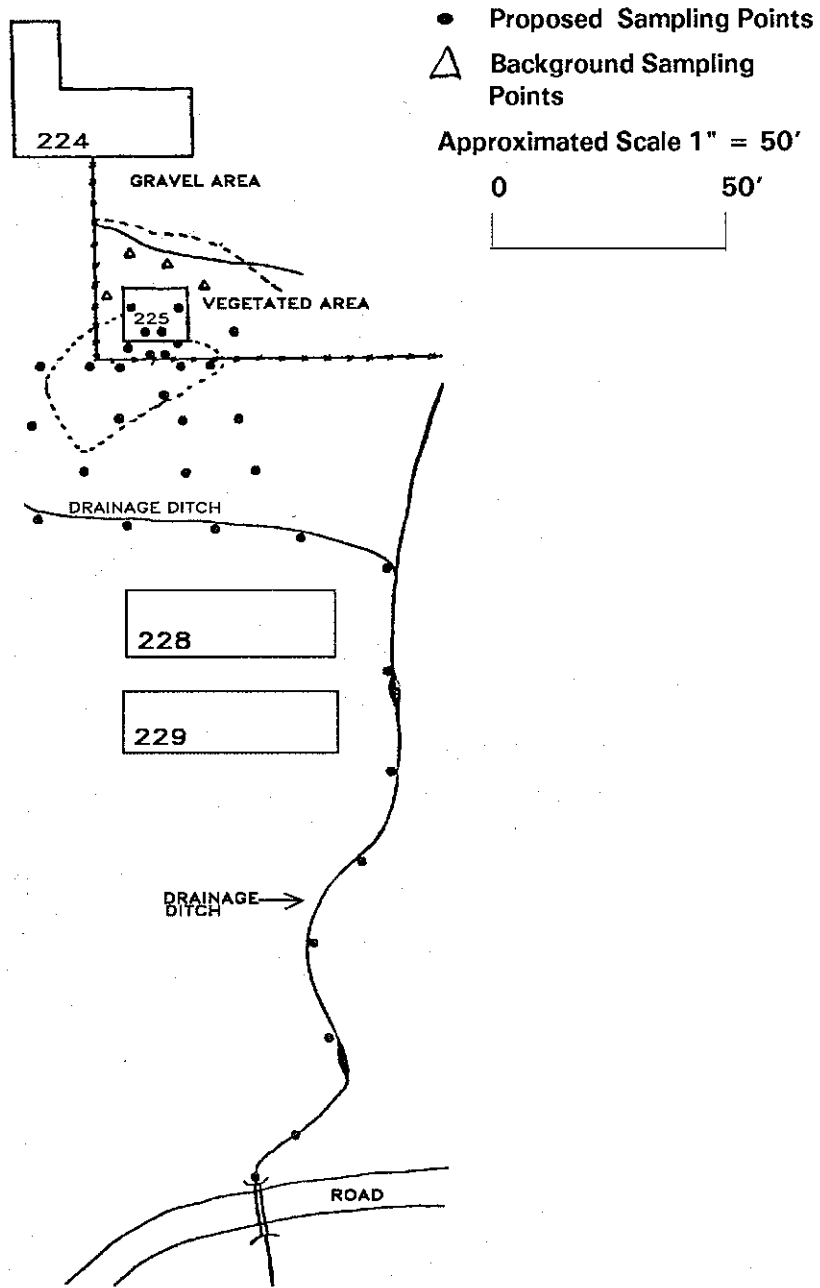
³⁶Msg ATEN-FN, Cdr USATRADO to DA (DAEN-ZCF), 251515Z Mar 85, subj: Fort A. P. Hill Cleanup-After Action Summary.

**ENCLOSURE 1 — FENCED AREA CONTAINING FORMERLY USED
HERBICIDE STORAGE SHED**



Source: Enclosure to letter, Lewis D. Walker, Deputy for Environment, Safety and Occupational Health, OASA (I&L), Office of the Assistant Secretary, Department of the Army, 16 November 1984, subject: Information for Parents of Scouts and Fort A. P. Hill Visitors.

ENCLOSURE 2 - CONTAMINATED AREA WITH PROPOSED SAMPLING POINTS



SOURCE: Letter DRXTH-AS, Andrew W. Anderson, Chief, Assessments Division, USATHAMA, 10 December 1982, subject: Installation As-

ENCLOSURE 3 - CONTAMINANT LEVELS UNDER BUILDING 225

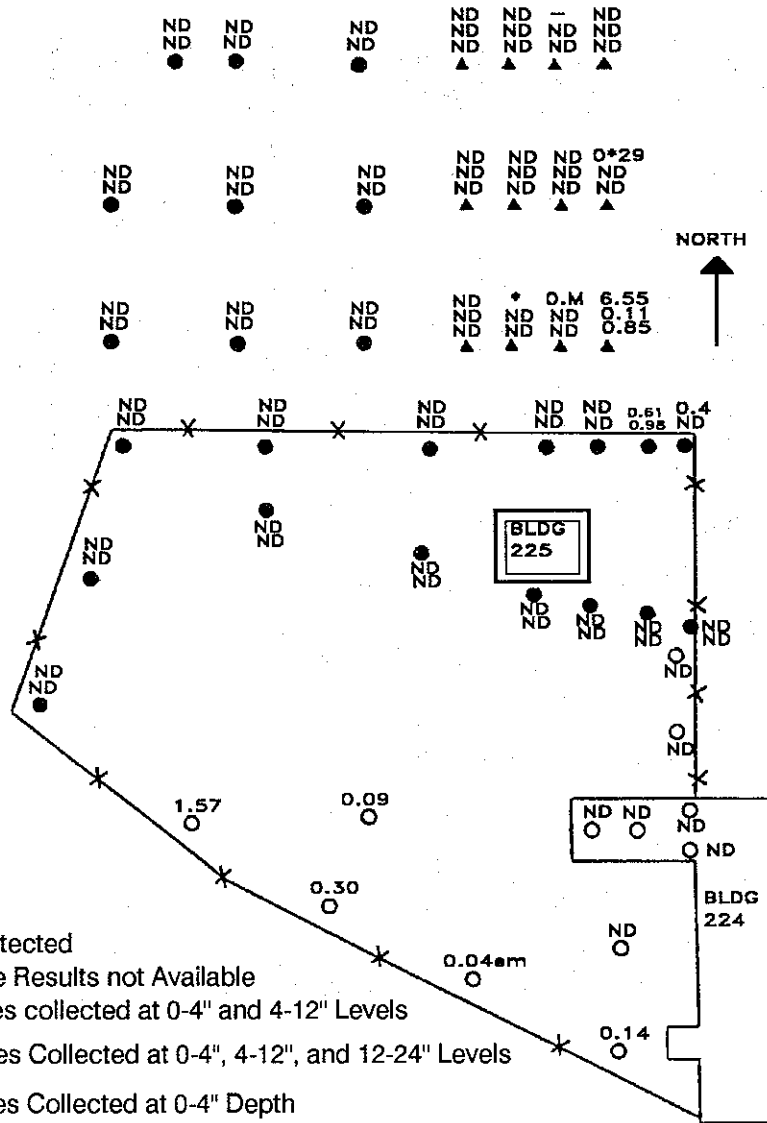
DOWNGRADIANT			NORTH
↑			↑
1.9 ND Δ ND ND 0.42	2.0 Δ 0.7 ND 4.3 1.6	1030 454 Δ 93 78 13.8	117 Δ 6.5 ND 27 0.61
0.7 13 \circ 0.08	ND \circ ND 0.05	51 \circ 92 4.2	0.95 \circ 0.09 0.06em
\circ 1.2 ND 0.09	ND ND \circ 0.06em	2.5 0.07em \circ 0.05em	1.38 0.09em \circ 0.5

- ND — Not Detected
- * — Sample Results Not Available
- em — Estimated Maximum
- Δ — Samples collected at 0-4", 4-12", 12-24", 24-36" and 36-48" Levels
- \circ — Samples collected at 0-4", 4-12" and 12-24" Levels

NOTE: All values are in parts per billion (ppb)

Source: Weston-Sper Feasibility Study, Dioxin Contamination at Fort A. P. Hill, Virginia, December 31, 1984.

ENCLOSURE 4 - CONTAMINANT LEVELS AROUND BUILDING 225



- ND - Not Detected
- * - Sample Results not Available
- - Samples collected at 0-4" and 4-12" Levels
- ▲ - Samples Collected at 0-4", 4-12", and 12-24" Levels
- - Samples Collected at 0-4" Depth

NOTE: All values are in parts per billion (ppb) Approx. Scale 3/4" = 40 feet

Source: **Weston-Sper Feasibility Study, Dioxin Contamination at Fort A. P. Hill, Virginia, December 31, 1984.**

CHRONOLOGICAL RECORD OF EVENTS

- 1962 – Fort A. P. Hill begins storage of herbicides in Building 225
- 1968 – Use of chemicals by Facility Engineer personnel discontinued. Herbicides remain in storage in Building 225
- 1968–1976 – Deterioration of herbicide containers, contamination of Building 225, and leakage into soil in its vicinity
- Oct 1976 – USAEHA conducts installation pest management survey at Fort A. P. Hill. Herbicide storage methods found inadequate. Soil contamination not identified
- Summer 1977 – Herbicides recontainerized, storage building upgraded
- 1978 – Use of 2,4,5-T and related phenoxy herbicides discontinued by TRADOC. Herbicides removed from Building 225, and building vacated
- 1980 – Times Beach, Missouri contaminated by dioxin
- Summer 1981 – BSA Jamboree at Fort A. P. Hill. Small encampment located outside Building 225 fenced area
- Nov 1981 – USATHMA conducts phase I of installation restoration program (IRP) at Fort A. P. Hill. Contamination around Building 225 officially identified for first time
- 10 Dec 1982 – Completed USATHMA IRP report provided to Fort A. P. Hill
- 28 Mar 1983 – Fort A. P. Hill requests sampling of contaminated materials by USAEHA
- Mar 1984 – USAEHA conducts sampling to determine the presence of phenoxy herbicides. Potential dioxin poisoning suspected
- 6 Jul 1984 – USAEHA sampling report recommends analysis of samples for dioxin content
- Aug 1984 – Contractor conducts dioxin testing
- 22 Oct 1984 – Richmond (Va.) Times-Dispatch requests USATHMA Phase I Installation Restoration Report of December 1982 under Freedom of Information Act
- 26 Oct 1984 – Fort A. P. Hill receives advanced notice of dioxin contamination

- 26 Oct-
- 5 Nov 1984 – Fort Lee staff organizes to respond to the problem
- 5 Nov 1984 – Results of August 1984 tests received, indicating definite dioxin soil contamination
- 6 Nov 1984 – Department of the Army meeting to define problem and establish course of action
- 8 Nov 1984 – DA and EPA meet to coordinate efforts
- 9 Nov 1984 – DA informs BSA of contamination
 - First press release on dioxin contamination at Fort A. P. Hill
- 10 Nov 1984 – DA holds press conference to deflate uninformed speculation about dioxin exposure to 1981 BSA Jamboree
- 15 Nov 1984 – Planning meeting at Aberdeen Proving Ground to generate draft sampling plan
- 16 Nov 1984 – Fort A. P. Hill Information Center established to respond to public concern
- 20 Nov 1984 – Maj. Gen. Stillions, Cdr USA Quartermaster Center and Ft Lee, formally named Executive Agent to coordinate cleanup
- 21 Nov 1984 – TRADOC meeting at Fort Lee to formalize responsibilities for cleanup phase
- 23 Nov 1984 – Revised sampling plan circulated
- 27 Nov 1984 – Field sampling begins at Fort A. P. Hill
- 29 Nov 1984 – DA hold on site press conference for update of sampling activities
- 6 Dec 1984 – Field sampling completed at Fort A. P. Hill
- 10 Dec 1984 – Fort Lee cleanup action plan completed
- 14 Dec 1984 – Draft ground-water monitoring plan completed and circulated
- 21 Dec 1984 – Sampling results received, sent for quality assurance and quality control evaluation by CDC
- 31 Dec 1984 – Feasibility study for cleanup completed by Weston-Sper
- 7 Jan 1985 – Final ground-water monitoring plan published. Drilling of monitoring wells begins

- 15 Jan 1985 – CDC and Menninger Foundation complete re-analysis, minimal boundaries of contamination verified
- 17 Jan 1985 – BSA holds press conference announcing plan to return to Fort A. P. Hill for summer 1985 jamboree
- 22 Jan 1985 – Cleanup measures at Fort A. P. Hill begin
- 23 Jan 1985 – DA press conference outlines cleanup plans
- 22 Feb 1985 – Process of cleanup completed

LIST OF ACRONYMS

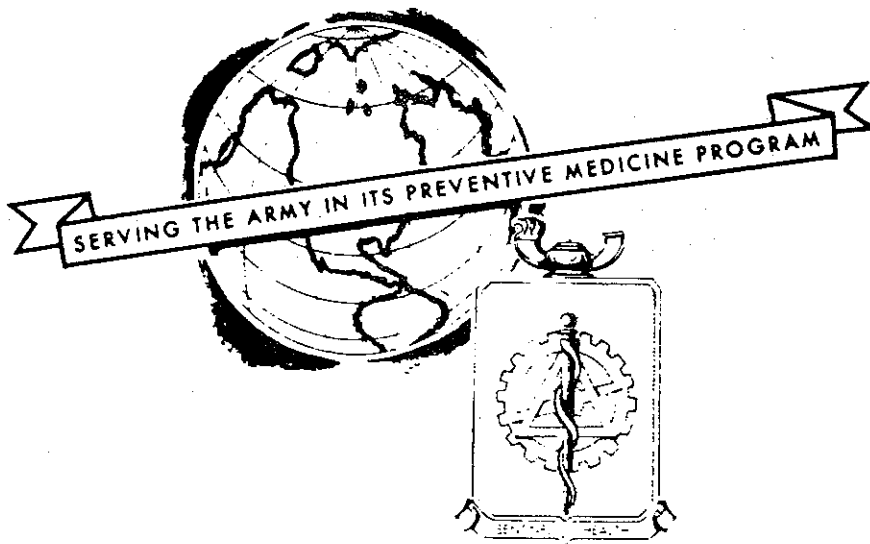
BSA	Boy Scouts of America
CDC	Department of Health and Human Services Centers for Disease Control
EPA	U.S. Environmental Protection Agency
FE	Facilities Engineer
ISSA	interservice support agreement
ppb	parts per billion
TCDD	2,3,7,8-Tetrachlorodibenzo P-dioxin
TRADOC	U.S. Army Training and Doctrine Command
USAEHA	U.S. Army Environmental Hygiene Agency
USATHMA	U.S. Army Toxic and Hazardous Materials Agency

LIST OF APPENDED DOCUMENTS

1. Installation Pest Management Program Survey No. 61-0501-77, 26-29 October 1976, USAEHA, 8 Jun 77.
2. Ltr, Lewis D. Walker, Deputy for Environment, Safety, and Occupational Health, Department of the Army, Office of the Assistant Secretary (I&L) to parents of Scouts, 16 Nov 84, subj: Information for Parents of Scouts and Fort A. P. Hill Visitors.
3. Ltr DRXTH-AS, Andrew W. Anderson, Ch, Assess Div, USATHMA to Cdr, Ft A. P. Hill, 10 Dec 82, subj: Installation Assessment of Fort A. P. Hill, Va, Report No. 316C.
4. Ltr HSHB-ES-H, Lt Col James M. Stratta, Actg Dir, Envir Quality, USAEHA to Cdr, USATRADO, 6 Jul 84, subj: Phase I, Hazardous Waste Management Consultation No. 37-26-0362-84, Investigation of Possible Herbicide Contamination In and Around Building 225, Fort A. P. Hill, Virginia, 12 March 1984.
5. Msg, HQDA DAEN-ZCE/DAEN-ZCF to Cdr TRADO, 132025Z Nov 84, subj: Expedited Clean-up of Dioxin Contamination at Ft A. P. Hill, Virginia
6. Ltr, Joe F. Banks, Dir, Engineering Service, BSA to Lt Gen E. R. Heiberg, III, Cdr/Ch of Engr, 5 Dec 84, w/incl: Lewis and Guy Rept for Dec 4, 1984 meeting; and Sampling Plan for the BSA to Determine Extent of 2,3,7,8-TCDD Contam in and Around Bldg 225 at Fort A. P. Hill, Va., prep by Guy and Davis, Consulting Engineers, 27 Nov 84.
7. Ltr HSHB-ES-H, Col Karl J. Daubel, Dir, Environmental Quality, USAEHA, to Cdr, USATRADO, 11 Dec 84, subj: Hazardous Waste Consultation No. 37-26-1376-85, Final Sampling Plan to Define extent of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) Contamination at Fort A. P. Hill, Va., w/incl: Sampling Plan.
8. Ltr HSHB-ES-G, Col Karl S. Daubel, Dir, Environmental Quality, USAEHA to Cdr, USATRADO, 7 Jan 85, subj: Revised Plan for Ground-Water Monitoring around Building 225, Fort A. P. Hill, Va. (Ground-Water Consultation No. 37-26-1376-85), w/incl: Revised Plan.
9. Action Plan, Dioxin Cleanup, Fort A. P. Hill, USA Quartermaster Center and Ft Lee, Va., 10 Dec 84.
10. EPA Form 1610-1, Interagency Agreement, EPA and DOD (USA Quartermaster Center, Ft Lee, Va.), Emergency Response at Fort A. P. Hill, Bowling Green, Va., S/EPA, 7 Jan 85; U.S. Army, 9 Jan 85.
11. EPA Form 1610-1, Interagency Agreement (Amendment), EPA and DOD (USA Quartermaster Center, Ft Lee, Va.), Emergency Response at Fort A. P. Hill, Bowling Green, Va.

12. Feasibility Study, Weston-Sper, Dioxin Contamination at Fort A. P. Hill, Virginia, 31 Dec 84.
13. Ltr, Stephen Margolis, Envir Health Mgr, Chronic Diseases Div, Cen for Envir Health, CDC to Mr. Ralph Jordan, BSA, 15 Jan 85.
14. Ltr, Stephen Margolis, Envir Health Mgr, Chronic Diseases Div, Cen for Envir Health, CDC, to Dr Walter F. Lee, EPA Region III, 15 Jan 85.
15. Statement, The Menninger Foundation, W. Walter Menninger, M.D., Chrmn, National Health and Safety, BSA (recommendation regarding dioxin contamination at Fort A. P. Hill).
16. Information Paper DASG-PSO-O, 8 Nov 84, subj: Health Effects Perspective-Potential Dioxin Exposure at Fort A. P. Hill.
17. News Release, BSA, Public Relations, 17 Jan 85, subj: No Health Hazard at Jamboree, Boy Scouts Say.
18. Statement, Stephen R. Wassersug, Dir, Hazardous Waste Management Div, U.S. EPA, Region III (23 Jan 85, subj: extent of contamination at Fort A. P. Hill).
19. News Release, Public Affairs Ofc, USA QM Cen, Fort Lee, Va., (23 Jan 85, subj: extent of contamination for Fort A. P. Hill).

INSTALLATION PEST MANAGEMENT PROGRAM SURVEY NO. 61-0501-77
FORT A. P. HILL
BOWLING GREEN, VIRGINIA
26-29 OCTOBER 1976



US ARMY
ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MD 21010



HSE-MM

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
REGIONAL DIVISION - NORTH
FORT GEORGE G. MEADE, MARYLAND 20755

JUN 2 1977

INSTALLATION PEST MANAGEMENT PROGRAM SURVEY NO. 61-0501-77
FORT A. P. HILL
BOWLING GREEN, VIRGINIA
26-29 OCTOBER 1976

ABSTRACT

This survey was conducted to evaluate medical and economic aspects of pest control, abatement requirements, and resources available to meet these requirements, and to provide technical assistance on the adequacy, safety, effectiveness and efficiency of the pest management program. Arthropod-borne disease potential and pest control requirements at Fort A. P. Hill were not clearly defined since routine surveillance was not performed by the supporting Health and Environment Activity; implementation of routine mosquito, cockroach, house fly and tick surveillance is recommended. Principal pests for which control operations were necessary included mosquitoes, cockroaches, house flies, termites, ticks, bees and wasps, rodents, woodchucks, birds and nuisance vegetation. The Environmental Impact Assessment for the aerial herbicide application program was in need of revision; preparation of an Environmental Impact Statement concerning the effects of aerial herbicide application on Federally protected animals was indicated. Pesticide storage and formulation facilities were inadequate and certain improvements in pesticide usage, handling and disposal procedures were indicated. Criteria for a suitable pest control facility have been provided the installation and instructions concerning pesticide usage, handling, and disposal procedures are included in this report.

Attached: extracted pages 16 and 26

(9) Herbicide Storage Facility.

(a) A copy of the USAEHA Ento Sp Study 99-045-75/76 was forwarded under separate cover to the Chief, Forestry and Wildlife Br, Pac Engr Div.

(b) The herbicide storage facility was inadequate. It consisted of a delapidated metal walled storage shed built about 4 feet off the ground on pilings; it was not a single purpose facility since it was used for storage of equipment, lime and fertilizer, as well as herbicides; nor was it fire resistive. The floor of the building was of rough-hewn wood with open spaces between the floor boards. Ventilation was provided by natural air flow through the floor and walls of the shed. The shed was kept locked when not in use.

(10) Herbicides and Herbicide Storage Procedures.

(a) Herbicides were stored with equipment, seeds, fertilizer, etc., in random fashion on wooden shelves, on the floor and on stacks of fertilizer and lime. They were not arranged under signs according to clearly labeled categories. Labels were not readily visible.

(b) One hundred and thirty gallons of 64.0 percent silvex EC were found in 26 badly corroded 5-gal metal containers. Most of the cans were leaking and herbicide had dripped onto the floor and through spaces between the floor boards onto the ground below. This situation presented a definite safety hazard since any movement of the containers resulted in additional spillage of the herbicides.

(c) Table 3, Appendix D, contains a complete inventory of herbicides stored in the Forestry and Wildlife Br herbicide storage facility.

(11) Herbicide Formulation Facilities and Procedures. The Forestry and Wildlife Br had no facilities for formulating herbicides. Herbicides were formulated wherever a convenient water source was available. A tank truck full of water was used as the water source when formulating herbicides and filling equipment in the field during aerial herbiciding operations. No special provisions were made at formulation sites to contain herbicide contaminated water in the event of an overflow or leak.

(12) Herbicide Handling and Safety.

(a) A rubberized suit was available for forestry personnel to wear during herbicide application; no other personal protective equipment was on hand.

(b) Emergency detoxification and decontamination equipment, i.e. sink, emergency shower, and eye lavage, were not provided herbicide applicators. Materials such as adsorptive clay, hydrated lime and sodium hypochlorite were not on hand for emergency detoxification of spills and leaks. The telephone number of the CHEMTREC was not available so that assistance could be requested in case of a herbicide spill.

Instl Pest Mgt Prog Surv No. 61-0501-77, Fort A. P. Hill, VA, 26-29 Oct 76

(7) Agricultural Outleases. Insure that leasees of outleased lands report all pesticide usage for inclusion in the monthly Pest Control Summary Report (DD Form 1532) (para 8-1, AR 420-76).

(8) Vegetation Control. Apply herbicides strictly IAW registered label instructions; the Boracil label specifies that the material should be applied with mechanical herbicide spreaders (para 6-6a, AR 200-1).

(9) Herbicide Storage Facility. Store herbicides in a secure, dry, ventilated, single purpose, fire resistive facility which meets the criteria set forth in USAEHA Ento Sp Study 99-045-75/76 (para 6-7a, AR 200-1).

(10) Herbicides and Herbicide Storage Procedures.

(a) Store herbicides in an orderly fashion; segregate each formulation and store under a sign containing the name of the formulation; store all containers off the floor and in such a manner that labels are clearly visible (40 CFR 165.10; para 6-7a, AR 200-1).

(b) Store herbicides separately from seed and fertilizer (para 6-7a, AR 200-1).

(c) Recontainerize the 130 gallons of 64 percent silvex and properly relabel the new containers (Table 6-4, AR 200-1; 40 CFR 165.10). See Table 6-4, AR 200-1 for recontainerization instructions.

(d) Cover the herbicide contaminated floor boards of the present herbicide storage facility with lineoleum or other durable, impermeable floor covering to prevent further contamination of personnel and stored materials until a suitable storage facility is obtained [para 5e(10)(b), this report].

(11) Herbicide Formulation Facilities and Procedures.

(a) Provide a herbicide formulation facility which meets the criteria contained in USAEHA Ento Sp Study 99-045-75/76.

(b) Provide for containment of pesticide contaminated overflow or leakage at equipment filling sites in the field (para 5e(11), this report).

(12) Herbicide Handling and Safety.

(a) Provide adequate protective clothing as required during herbicide formulation and application procedures to include a daily change of clothing, washable caps, rubber gloves, rubber apron, rubber boots and NIOSH approved respirator [para 6-1b, AR 420-76; para 4, AR 385-32; para 75a(2), TM 5-630; 29 CFR 1910; TB MED 223]. See Appendix J for a listing of NIOSH approved respirators.

(page 26)



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310

November 16, 1984

SUBJECT: Information for Parents of Scouts and Fort A. P.
Hill Visitors

I know that the recent discovery of herbicide contamination at the site of the 1981 Jamboree at Fort A. P. Hill has caused a great deal of concern. We share this concern and have provided as much information as we have available to the National Council of the Boy Scouts of America and to various government agencies and civilian organizations so that they may help us resolve our concerns. I hope that the information in this packet will alleviate your fears about any possible health risk.

The contamination appears at present to be concentrated in a small area primarily under a storage shed located within a fenced area. The shed was used until 1978 for mixing and storing herbicides. While some of the Jamboree staff used the building for storing equipment, it was not used by or readily accessible to the scout youth at the Jamboree. Our preliminary soil samples indicate that some of the contamination has spread outward from the building, but in much lower levels than that directly under the building.

The attached maps show the location of the building relative to the camping areas of the Jamboree and the fenced compound. The campers nearest the contamination were staff members who were billeted adjacent to the compound fence and downhill from the building. They lived in Army tents equipped with plywood floors and slept on cots, so direct contact with the ground was minimal. The nearest scouts camped approximately 150 feet away uphill from or level with the shed. Most scouts camped even farther away.

The herbicides detected are broadleaf weed killers known as 2,4-D, 2,4,5-T and 2,4,5-TP (silvex). 2,4,5-T and 2,4,5-TP (silvex) are commonly contaminated with small amounts of dioxin, an impurity formed during the manufacturing process. The highest level of dioxin contamination discovered was 228 parts per billion (ppb) directly under the shed. This level decreases to 5.0 ppb approximately 20 feet downhill from the shed. By means of comparison, residents of the town of Times Beach, Missouri

DOCUMENT 2

32

were exposed to contamination levels of up to 980 ppb for up to 12 years. A recent study conducted by the United States Department of Health and Human Services, Centers for Disease Control (CDC), did not demonstrate any adverse health effects in the Times Beach residents. The potential for exposure of the Boy Scouts at the Jamboree was far less than that of the residents of Times Beach.

In summary, our findings thus far indicate that these very low levels of dioxin contamination are confined to a small area. This, coupled with the short exposure time (two weeks or less), show there is no likelihood of a health hazard. An independent assessment by the Centers for Disease Control supports this conclusion. Nevertheless, we are continuing to study the situation and welcome the initiative of the Boy Scout leaders to help our efforts.

I have attached a more detailed information sheet covering the history of the contamination, our plans to clean up the site before the 1985 Jamboree and a summary of the known effects of dioxin, prepared by the Office of the Army Surgeon General. I have also attached the announcement of the Centers for Disease Control findings.

We are proud of our association with the Boy Scouts and are working hard to ensure that the 1985 Jamboree is safe and successful. As more information becomes available we will share it with the Boy Scouts, other involved government and private agencies and the public.

I regret that this situation may have caused you alarm and hope that this information packet will help reduce your concern.

Sincerely,

Lewis D. Walker

Lewis D. Walker
Deputy for Environment, Safety
and Occupational Health
OASA (I&L)

Attachments

INFORMATION PAPER

Fort A. P. Hill is located in the northeastern portion of Caroline county, Virginia, 40 miles north of Richmond and 20 miles southeast of Fredricksburg. Fort A. P. Hill, Virginia was used as the site for the 1981 National Boy Scout Jamboree and is the planned location of the 1985 Jamboree. Public concern was generated when recent findings indicated that a herbicide contamination exists in a small area of this fort.

The presently identified area of contamination is limited to a storage shed (building 225) and some of the adjacent land downhill from the shed. The 17' x 32' structure is located within a fenced compound formerly used by the Fort A. P. Hill Forestry and Wildlife Branch. Records indicate that the shed was first used for mixing and storage of herbicide in the early 1960s.

Herbicides now known to have contained traces of dioxin were used in forestry management for underbrush control. The underbrush spraying operations at Fort A. P. Hill did not cause the recently discovered contamination. Dioxin decomposes rapidly when exposed to the ultraviolet rays of sunlight and contamination occurs when it binds with the soil as it did under the shed.

In 1978, a herbicide monitoring study was conducted. The purpose of this study was to evaluate drift controls and potential environmental contamination. No residual herbicide levels were found which would restrict future uses of the installation. In October 1983, soil samples in the area of the amphitheater were tested for possible dioxin contamination. No dioxin was detected in any of the samples.

A small quantity of left over herbicide (approximately 95 gallons) was stored in the shed, until removed in 1978 and later disposed of properly. Since that time no herbicide has been stored there, and the use of this group of herbicides has been discontinued at the fort.

In April 1982, as part of the Army-wide program to assess environmental pollution at Army installations, the Army conducted a records search to assess the possibility of toxic and hazardous material contamination existing at Fort A. P. Hill. The results of this assessment, issued in December 1982, identified the shed as a possible site of herbicide contamination. The assessment report recommended soil sampling and analysis to determine if any contamination was present.

Fort A. P. Hill requested the Army's Environmental Hygiene Agency (USAEHA) to sample and analyze the area under and around the shed. The Fort A. P. Hill request was incorporated into the Army-wide program of environmental sampling. Soil sampling for residual herbicide was conducted in March 1984.

The results, received by Fort A. P. Hill in August 1984, indicated that the flooring and the soil under the shed were contaminated with 2,4-D, 2,4,5-T and 2,4,5-TP (silvex) herbicides. The drainage areas around the building were not highly contaminated with the herbicides. Additional soil samples were taken and forwarded to an Environmental Protection Agency (EPA) certified laboratory for analysis to determine the presence of dioxin, a known impurity in 2,4,5-T and 2,4,5-TP (silvex), which is highly toxic in its pure form.

The results received on November 5, 1984 revealed that the soil under the shed contains 228 parts per billion (ppb) of dioxin residue and that soil down slope contains 3.2 ppb. Upon notification from the laboratory that the soil did indeed contain dioxin, Fort A. P. Hill directed this laboratory to send the samples to another EPA approved laboratory for verification of the analysis.

The verification was received on November 14, 1984, which confirmed earlier findings. This analysis assessed the contamination under the shed at 205 parts per billion (ppb) and down slope from the shed at 5 ppb. The slight difference in laboratory results is not unusual when dealing with such small quantities.

Based on the November 5 preliminary findings, Fort A. P. Hill initiated additional precautionary measures, extending the compound fence to surround the known area of contamination downhill from building 225, and posted warning signs.

The Army conducted meetings with the Environmental Protection Agency and the Commonwealth of Virginia on Thursday November 8, and on Friday November 9, with representatives from the Boy Scouts. The purpose of these meetings was to pass on our information and begin developing a plan of action to collect additional samples to determine the extent of contamination.

The Army is developing a sampling plan with EPA, Commonwealth of Virginia, and Department of Health and Human Services, Centers of Disease Control, to determine the extent and degree of contamination. When planning is completed, sampling will begin immediately and the results of these analyses should be available within 30 to 60 days.

Also, the Boy Scouts of America have hired an independent engineering firm to assess the situation.

After determining the extent of contamination the Army will conduct a complete cleanup at the site, well before the 1985 Jamboree. Excavation, packaging, and transportation of contaminated soil and building materials will be conducted by a qualified contractor. The containers of contaminated material will ultimately be disposed of in a manner approved by EPA. Once cleanup has been completed, follow-up soil and ground water sampling will be conducted to confirm that all dioxin residues have been removed.

There have been no consistent medical findings about the effect of dioxin on humans except for a skin rash known as chloracne. It is difficult to clinically tell the difference between chloracne and the common acne of young adults. The body systems most prominently affected by extensive dioxin exposure in laboratory animals are the liver and immune system. There are no specific clinical laboratory tests or clinical findings to determine the degree of dioxin exposure or its toxic effects in humans.

Serious health hazard comes after prolonged exposure to high concentrations of dioxin. This usually results from direct contact with or after ingestion of contaminated materials. The scouts did not meet this criterion at Fort A. P. Hill. The contamination is at levels at which no harmful health effects would be expected. Most of the contamination appears to be confined to under the shed and the immediate vicinity of the shed. Further, the scouts were there less than two weeks.

The Army has provided the Centers for Disease Control (CDC) all available information concerning the contamination at Fort Hill. According to CDC, "...the chance for harmful dioxin exposure of scouts during the Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of scouts at the Jamboree are not necessary or recommended. The risk assessment that CDC previously performed on dioxin was based upon a 70-year lifetime exposure. The maximum possible exposure for boy scouts at the Jamboree would be less than two weeks. It is our estimate that no harm was done."

This CDC assessment confirms the Army's belief that on the basis of information now available the Boy Scouts were not exposed to any health risks and that there is no need for physical examinations or laboratory tests on the scout population.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

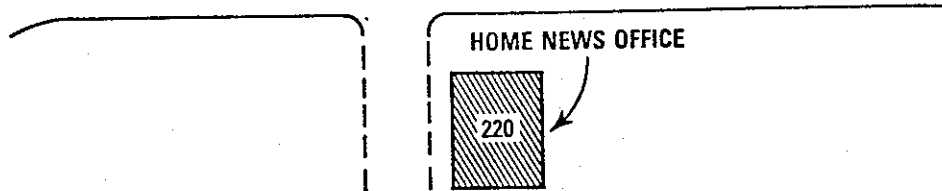
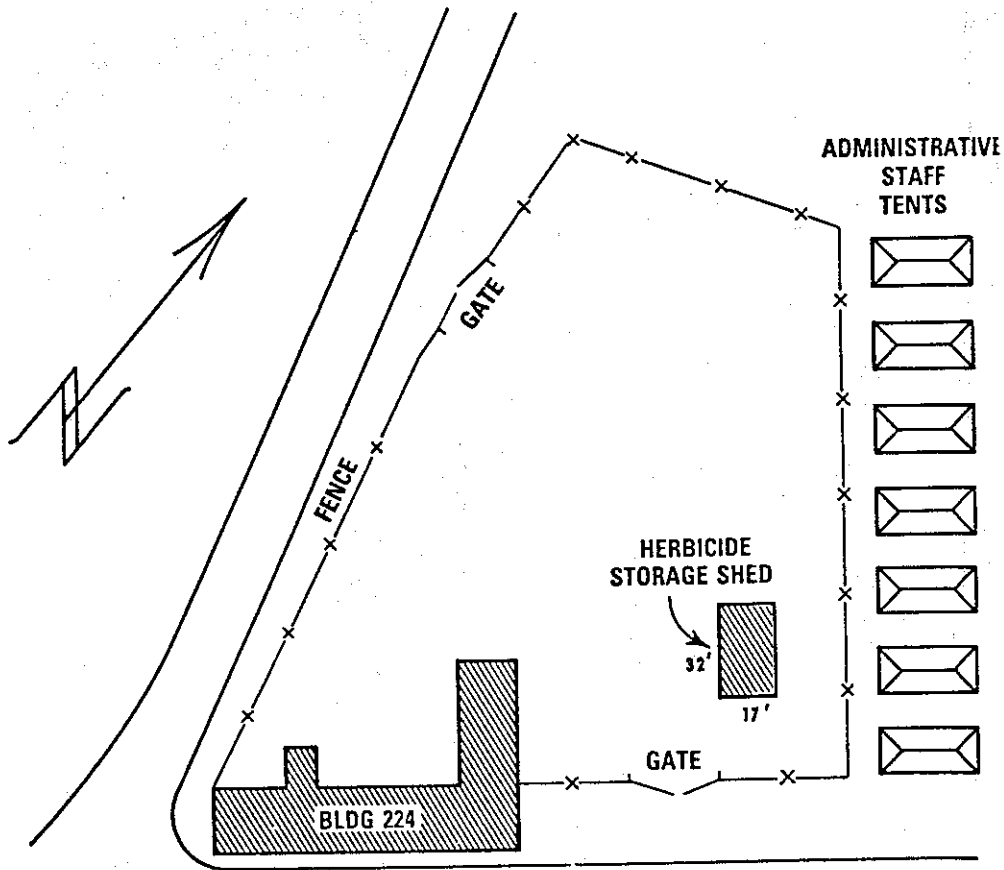
The Centers for Disease Control (CDC) has been contacted by the Department of the Army Surgeon General's office and the Boy Scouts of America regarding dioxin contamination at Fort A.P. Hill, Virginia. Preliminary findings at the fort indicate that dioxin was detected in soil near a herbicide storage shed in a fenced enclosure in the vicinity of where a National Jamboree was held in 1981.

Based upon the information we have, the chance for harmful dioxin exposure of scouts during the Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of scouts at the Jamboree are not necessary or recommended.

The risk assessment that CDC previously performed on dioxin was based upon a 70-year lifetime exposure. The maximum possible exposure for boy scouts at the Jamboree would be less than two weeks.

It is our estimate that no harm was done. If any information is obtained to alter this opinion, CDC will revise its recommendations.

FENCED AREA CONTAINING FORMERLY USED HERBICIDE STORAGE SHED





REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
US ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

DRXTH-AS


10 DEC 1982

SUBJECT: Installation Assessment of Fort A. P. Hill, VA, Report No. 316C

Commander
Fort A. P. Hill
Bowling Green, VA 22427

1. In November 1981, this Agency conducted an onsite Records Search at Fort A. P. Hill to determine the existence of toxic and hazardous materials and related contamination, emphasizing those substances posing a potential for off-post migration.
2. The search identified potential problem areas at Fort A. P. Hill which are summarized, along with corresponding recommendations, on pages i - ii of the report. It has been recommended that no survey by this Agency be conducted at Fort A. P. Hill at this time.
3. Four copies of the report, revised in accordance with your comments, are provided for your information and to honor outside agency requests.

FOR THE COMMANDER:


 ANDREW W. ANDERSON
 Chief,
 Assessments Division

1 Incl
as

CF:
 Cdr, DARCOM, ATTN: DRCIS-A, 5001 Eisenhower Avenue, Alexandria, VA 22333
 w incl
 Cdr, USAEHA, ATTN: HSE-E/HSMB-ES, Aberdeen Proving Ground, MD 21010 w incl
 Cdr, TRADOC, ATTN: ATEN-FE, Fort Monroe, VA 23651 w incl

Attached: extracted pages i, ii, 2-9, and 3-9

U.S. ARMY GARRISON, FORT A.P. HILL
SUMMARY

An onsite installation assessment was conducted at the U.S. Army Garrison, Fort A.P. Hill (FTH), Bowling Green, Va., to assess past and current use of toxic and hazardous materials, as well as the potential for these substances to migrate off the installation.

The initial installation assessment identified the following sources of potential contamination:

1. Waste photographic solutions,
2. Herbicide storage,
3. Silvex in the soil near Bldg. 0225, and
4. DDT in the soil behind Bldg. 1233.

An additional problem noted was the exceeding of National Pollutant Discharge Elimination System (NPDES) permit requirements for selected parameters by the four sewage treatment plants (STPs).

Available geologic evidence and information on contaminant sources do not indicate offpost migration of contaminants via surface or subsurface waters; therefore, a follow-up survey by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is not recommended. However, the following actions by FTH are recommended:

1. Properly store herbicides;*
2. Conduct sampling and analysis of the soils which were beneath the former herbicide storage facility (near Bldg. 0225, Mahone Area) to determine the extent of silvex contamination, if any, and take appropriate action;
3. Continue the program to clean up the DDT-contaminated soils near Bldg. 1233;*

(page i)

4. Institute a silver recovery program for waste photographic solutions generated by the photographic laboratory (Bldg. 136); and
5. Bring the STPs into compliance with the NPDES permits.*

* Subsequent to the site visit, the following actions were reported by FTH (keyed to Recommendations):

1. Herbicide storage in Bldg. 1214 has been discontinued. All pesticides are currently stored in Bldg. 139, which complies with Federal recommended procedures [U.S. Environmental Protection Agency (EPA), 1981a] for pesticide storage;
3. DDT-contaminated soils behind Bldg. 1233 are contained, and actions are underway to clean up the spill site to meet state health department requirements; and
5. FTH is currently working with the Norfolk Corps of Engineers (COE) to remedy the design deficiency of the Headquarters Area STP. Operations at the Wilcox Camp STP have improved, and the plant is in compliance with NPDES limitations. The Cooke and Old Guard Camp STPs have been upgraded to land application systems to comply with final limitations.

(page ii)

4/21/82

rinse waters, and from 1968 to 1976, a 1,890-l concrete tank was used. Prior to 1968, rinse waters reportedly were drummed in 55-gallon (gal) drums and buried in the pest landfill at the rate of approximately one drum per week. The rinse water in the holding tanks was used for dilution of subsequent formulation. In 1977, USAEHA (1976a) discouraged this practice due to the incompatibility of the aggregate pesticide solutions. At about this same time, the 1,890-l concrete tank, in use from 1958 to 1976, was suspected to be leaking (USAEHA, 1976a) and, thus, the larger 3,700-l tank was installed. USAEHA (1979a) collected four soil samples in the wooded area between the pest control shop (Bldg. 139) and a stream at the bottom of a hill behind the shop. A sediment sample was also collected from the stream bed. Results of the soil and sediment analyses are presented in Table 2.1-4. USAEHA (1979a) reported that the pesticide residues found in these samples are not extraordinary when compared to samples taken near pest control shops at other installations.

2. Forestry and Wildlife Branch

Storage: Herbicides are stored in a former POL shed near Bldg. 1214, which has a floor consisting of crushed rock over soil. No runoff controls to contain possible spills were evident; therefore, this shed does not meet Federal guidelines (EPA, 1981a) as a proper storage facility. Prior to storage of herbicides in this shed, another shed located in the Mahone Area near Bldg. 0225 was used. This shed had wooden floors with open spaces between the floor boards. USAEHA (1976a) reported that badly corroded 5-gal metal containers of silvex EC (emulsifiable concentrate) stored in this shed were leaking through the floor boards and contaminating the ground beneath the shed.

(page 2-9)

3.2.2 PESTICIDES

The floor of the herbicide storage shed (near Bldg. 1214) consists of crushed rock over soil; therefore, this shed does not meet Federal (EPA, 1981a) recommended procedures, which require impervious flooring for pesticide storage facilities. Accidental spills in this shed would contaminate soils beneath the crushed rock floor. Due to the flat terrain at this location and the small volumes of herbicides being stored in this shed, surface migration is not likely; however, spills potentially could contaminate the local water table aquifer.

USAEHA (1976a) reported that corroded containers of silvex EC stored in a shed located in the Mahone Area near Bldg. 0225 were leaking through the floor boards and contaminating the soils beneath the shed. At the time of the site visit, this shed had been dismantled; however, no sampling or cleanup of the soils beneath the shed had been performed. The flat terrain in this area precludes surface migration from the site; however, the potential exists for subsurface seepage of the spilled herbicides into the local water table aquifer.

USAEHA (1980) found DDT levels up to 75,333 ppm in the soils behind Bldg. 1233, resulting from an accidental spill of DDT which had been stored in this area. At the time of the site visit, the area of the spill had been covered with plastic sheeting to prevent rainfall infiltration and surface runoff. Additionally, USAEHA (1980) found a compact clay barrier 76 cm deep, which would prevent vertical migration beyond that depth. Under Federal RCRA regulations, the DDT-contaminated soils would be classified as a hazardous waste for which there are specific storage requirements. WDED of USAEHA is currently working with FTH to delineate the extent of the contaminated area in order to design a cleanup plan.

3.2.3 SANITARY WASTEWATERS

A surge effect on the Headquarters STP creates problems in chlorination, resulting in nonattainment of the NPDES requirements for total residual chlorine. FTH is currently working with the Norfolk District COE to remedy this design deficiency.