TRADOC HISTORICAL RESEARCH REPORTS

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

by

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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.

The Report was written by Major Lee S. Harford, Jr., USAR, an Individual Mobilization Augmentee in the Office of the Command Historian and edited for publication by Mr. John L. Romjue, Chief, Historical Research and Analysis. The manuscript was word processed through its several drafts, with admirable efficiency, by Mrs. Claudine D. Lovett, Editorial Assistant.

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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-Dichlorophenoxyacebic Acid), and 2,4,5-T (2,4,5-Trichlorophenoxyacebic 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 subinstallation 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
$1,705,000	-	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.

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

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

[4]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, Doc 2.

[5]Ltr 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.

[6]Ibid.

[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.

[8]Ltr 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.

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

[11]Ltr, 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).

[12]These 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 USATRADOC, 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 TRADOC: 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 USATRADOC, 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 TRADOC, 132025Z Nov 84, subj: Expedited Clean-up of Dioxin Contamination at Ft A. P. Hill, Virginia, Doc 5.

[20]Ltr, 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.

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

[22]Ibid.

[23]Asst 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 USATRADOC 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, DAEN-ZCE 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).

[26]Ltr HSHB-ES-H, Col Karl J. Daubel, Dir, Environmental Quality, USAEHA, to Cdr USATRADOC, 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.

[27]Ltr HSHB-ES-G, Col Karl S. Daubel, Dir Environmental Quality, USAEHA, to Cdr USATRADOC, 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.

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

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

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

[31]This "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 USATRADOC, 4 Dec 84, subj: Dioxin Contamination at Fort A. P. Hill. (2) Memorandum ATEN-F, Col Joseph W. Stewart, Dir, Facilities Engineering, ODCSENGR, HQ USATRADOC, to distr, 3 Dec 84, subj: Coordination Meeting, Dioxin Cleanup, Fort A. P. Hill.

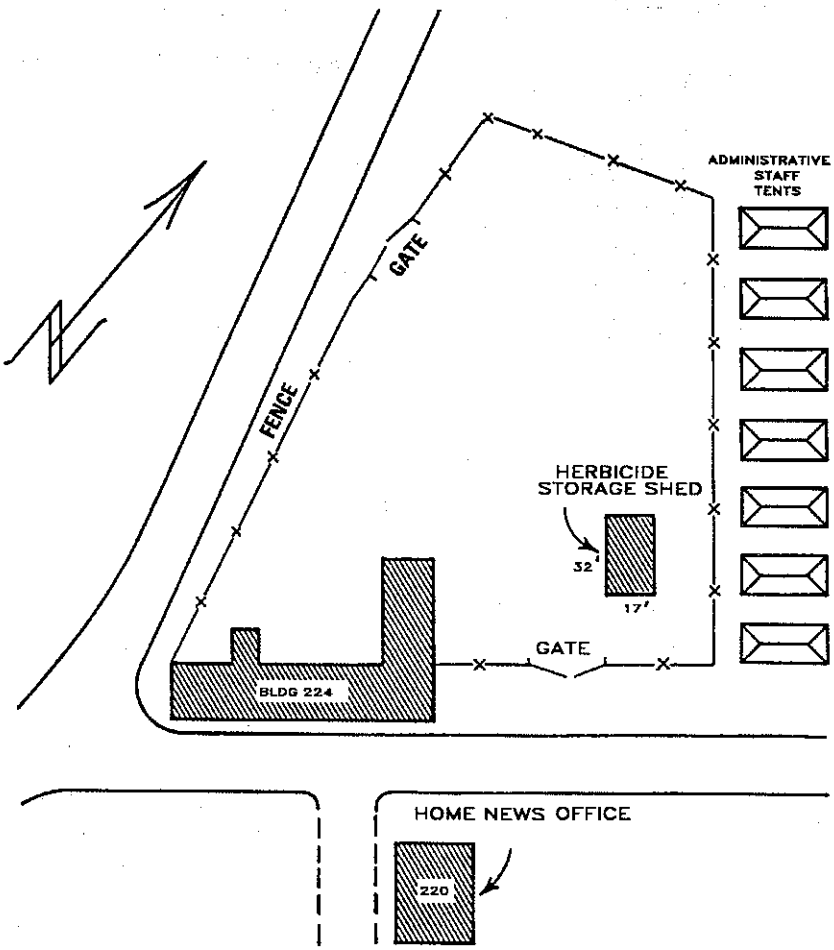
[33]Feasibility Study, Weston-Sper, subj: Dioxin Contamination at Fort A. P. Hill, Virginia, 31 Dec 84, Doc 12.

[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 USATRADOC 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.

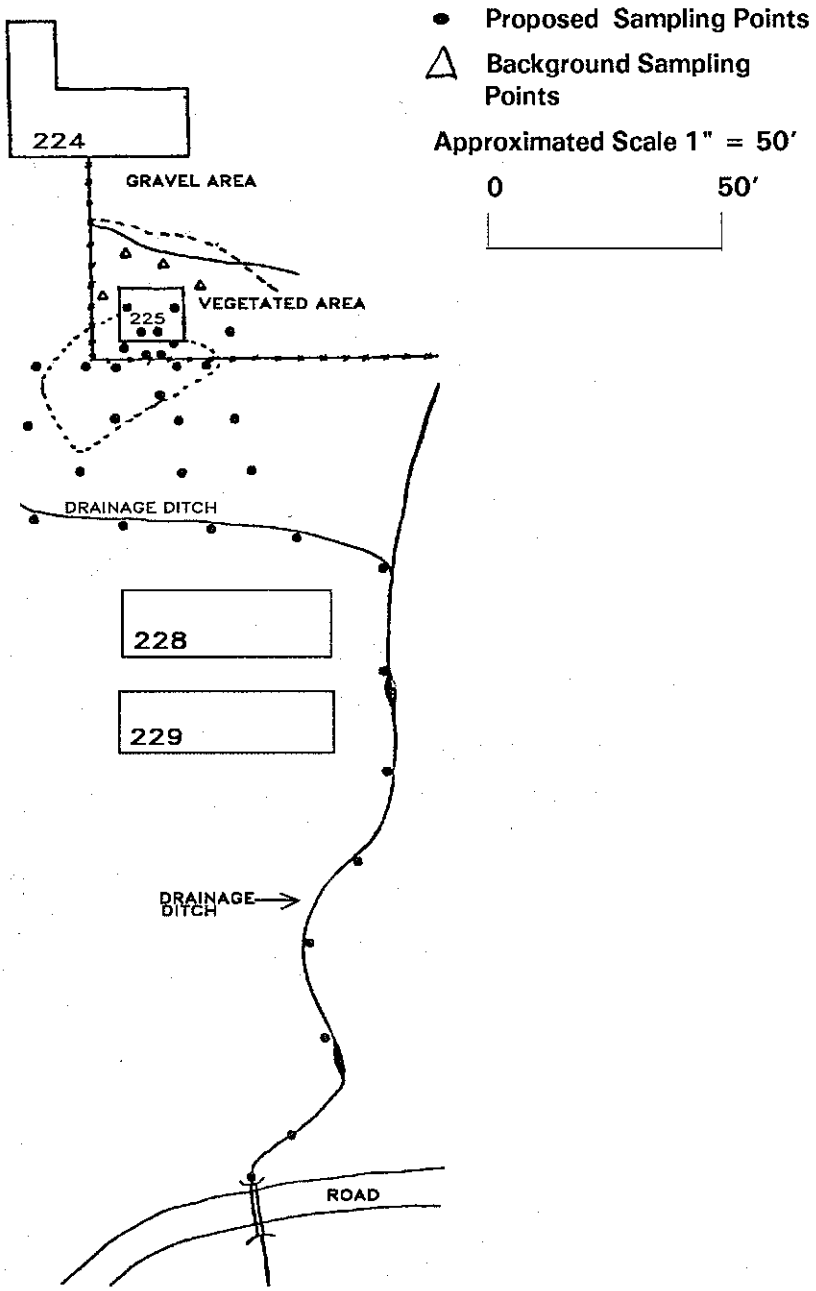
[36]Msg ATEN-FN, Cdr USATRADOC to DA (DAEN-ZCF), 251515Z Mar 85, subj: Fort A. P. Hill Cleanup-After Action Summary.

ENCLOSURE 1 — FENCED AREA CONTAINING FORMERLY USED HERBICIDE STORAGE SHED



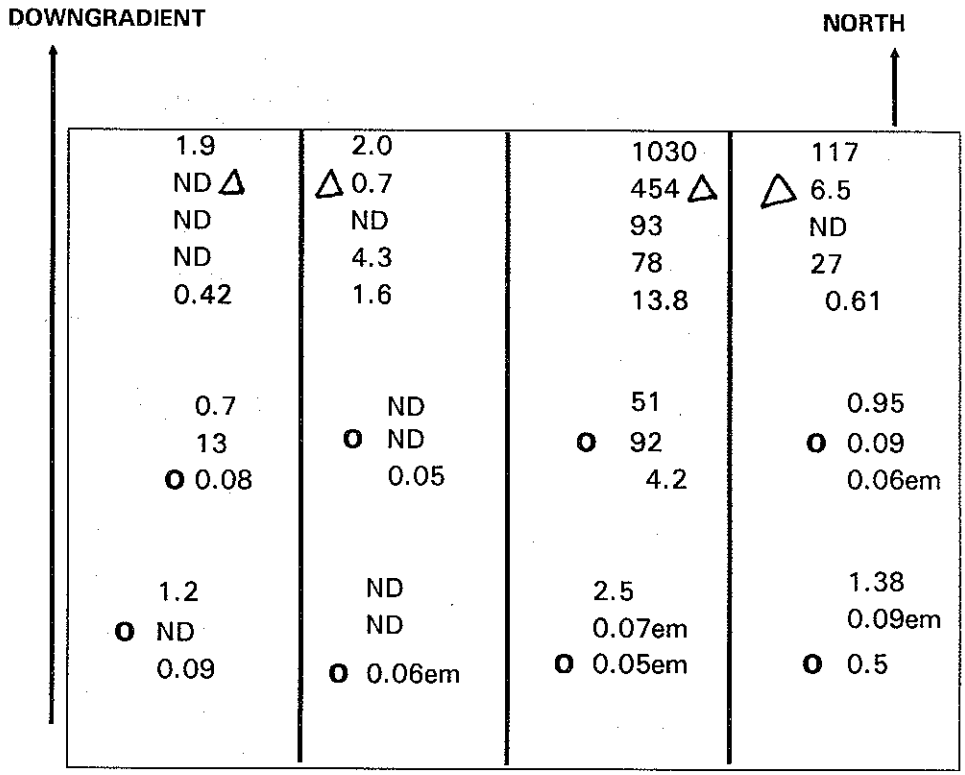
Source: Enclosure to letter, Lewis D. Walker, Deputy for Environment, Safety and Occupational Health, OASA (I&L), Office of the Assistant Secretary, Department of the Army, 16 November 1984, subject: Information for Parents of Scouts and Fort A. P. Hill Visitors.

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



ND — Not Detected

* — Sample Results Not Available

em — Estimated Maximum

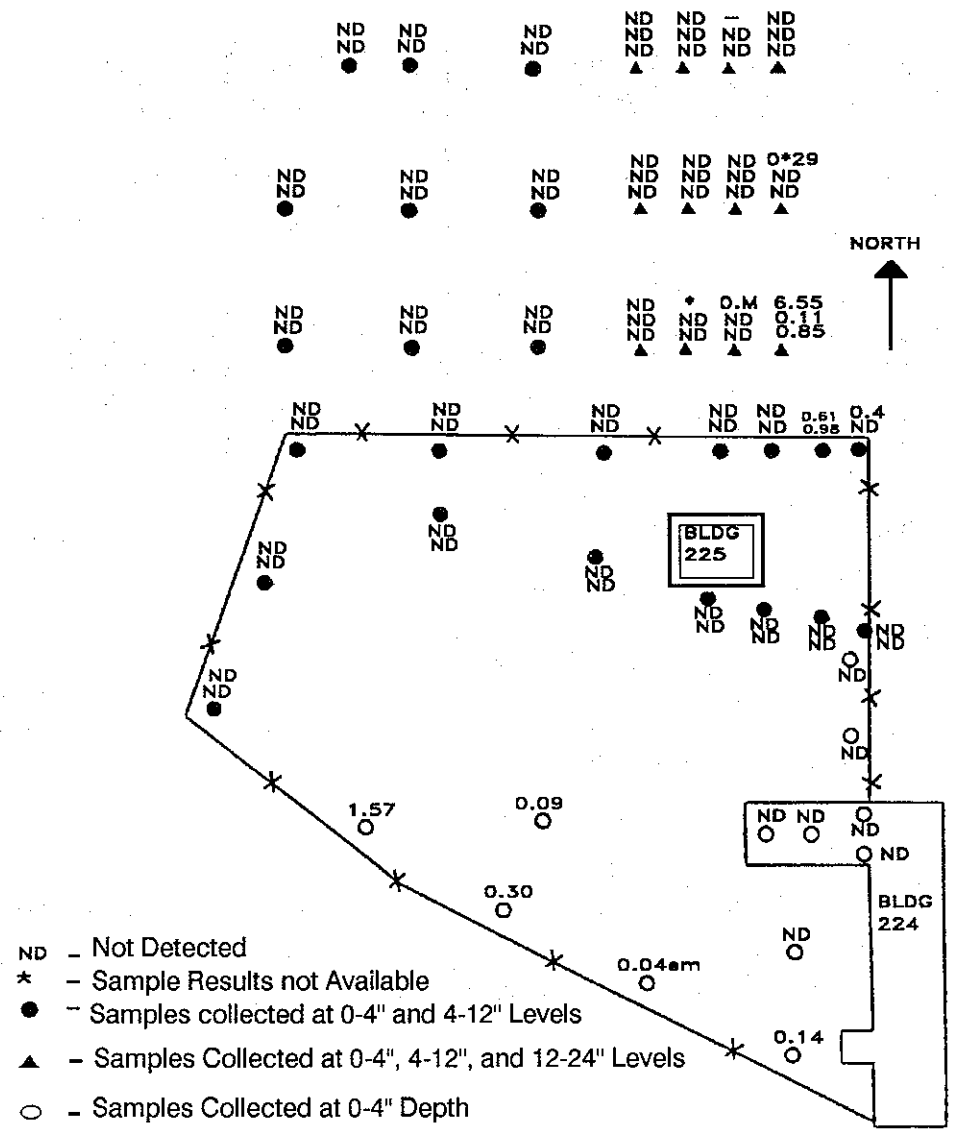
△ — Samples collected at 0-4", 4-12", 12-24", 24-36" and 36-48" Levels

o — 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



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 Ocupational 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, USATRADOC, 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 TRADOC, 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, USATRADOC, 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, USATRADOC, 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).

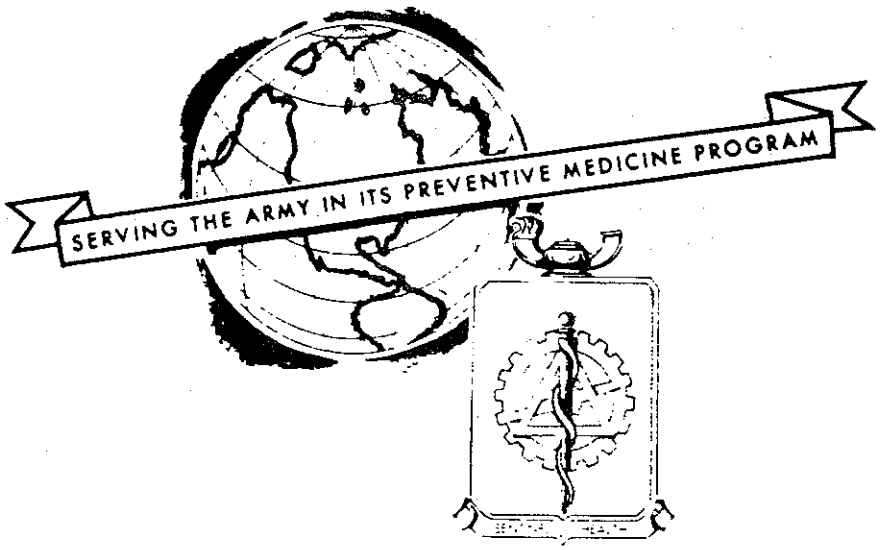
16. Information Paper DASG-PSO-O, 8 Nov 84, subj: Health Effects Perspective-Potential Dioxin Exposure at Fort A. P. Hill.

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

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

HSE-MM

JUN 8 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, Fac 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.

(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

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 encorporated 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 quanties.

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. Futher, 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

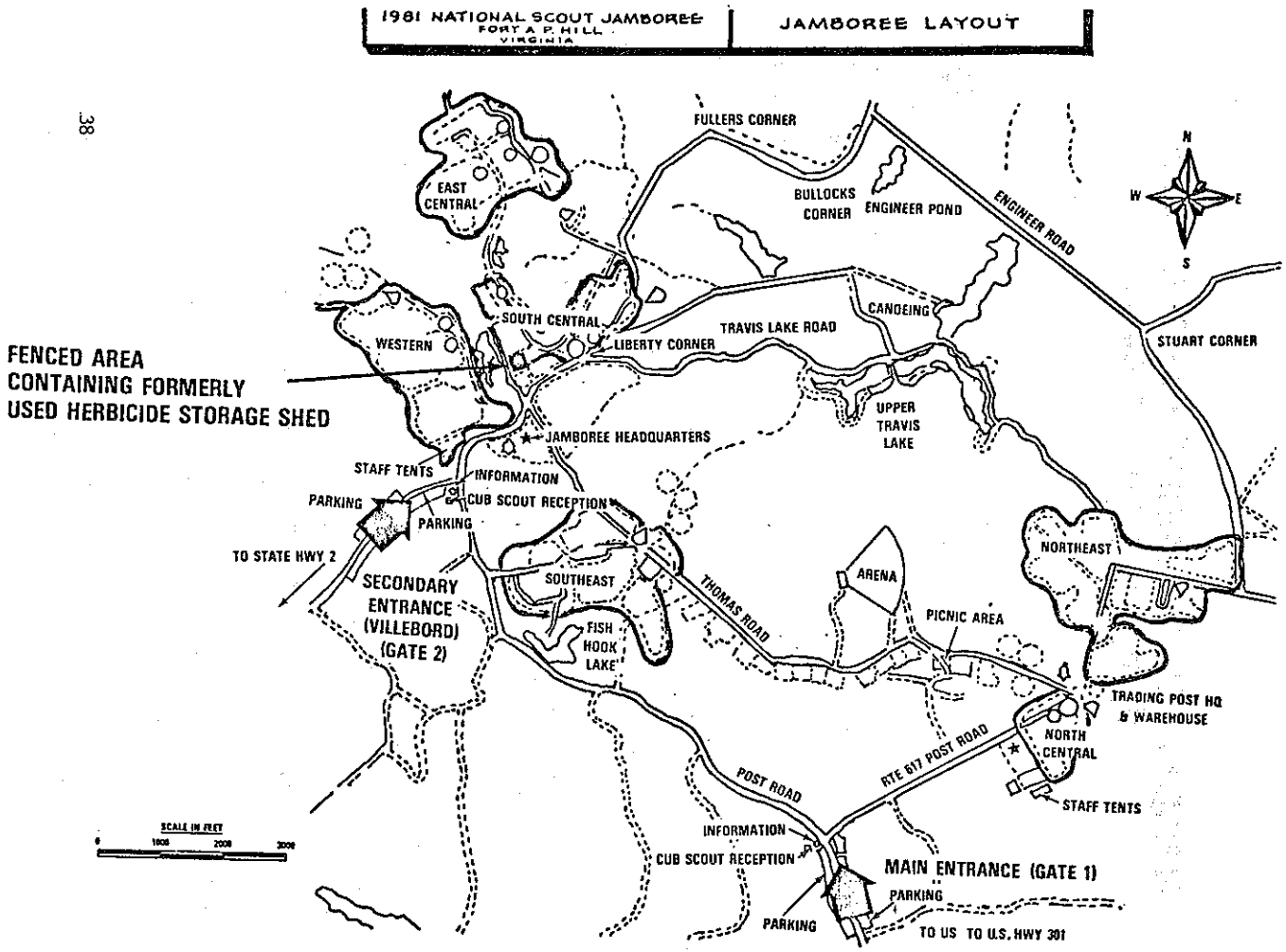
Centers for Disease Control
Atlanta GA 30333

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.

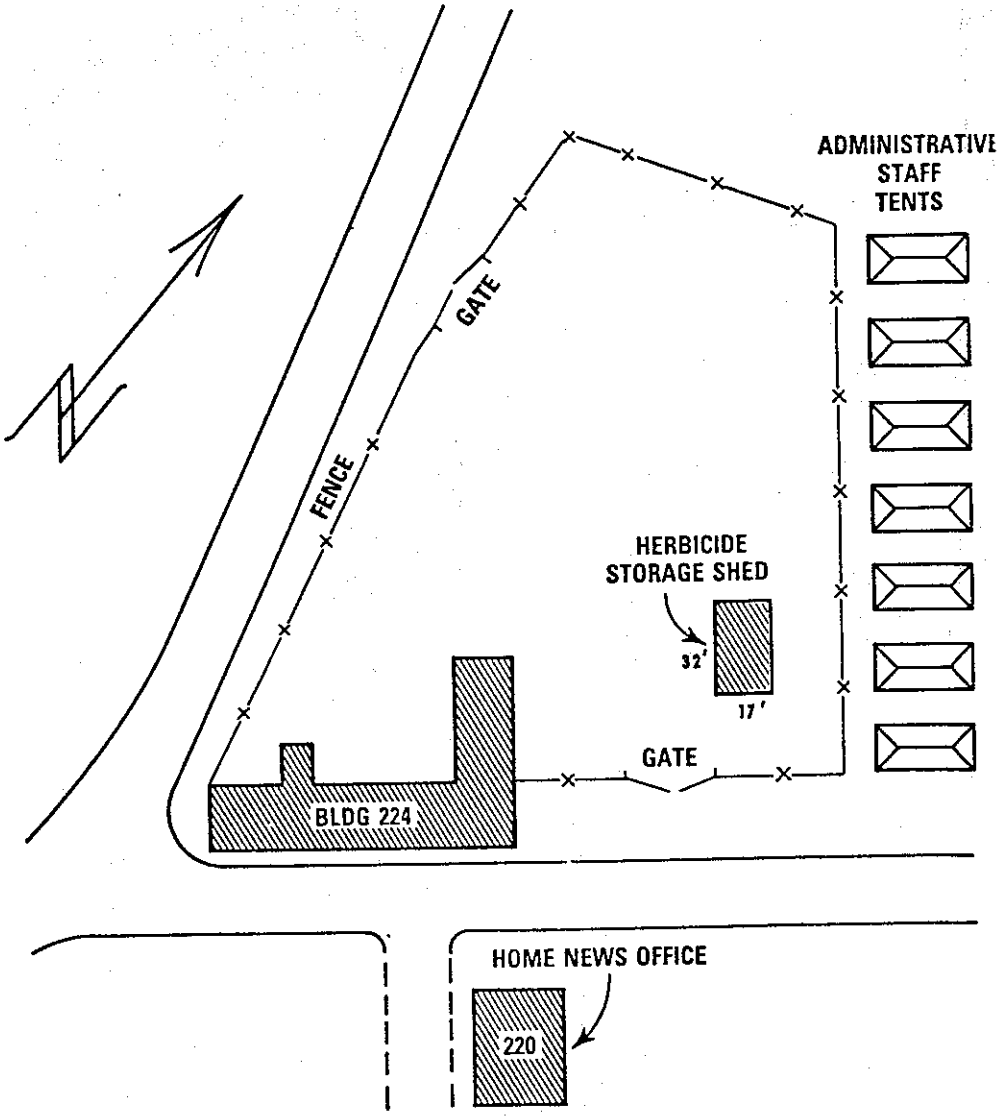
Based upon the information we have, the chance for harmful dioxin exposure of scouts during the Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of scouts at the Jamboree are not necessary or recommended.

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.


1981 NATIONAL SCOUT JAMBOREE
FORT A. P. HILL
VIRGINIA
JAMBOREE LAYOUT
FENCED AREA
CONTAINING FORMERLY
USED HERBICIDE STORAGE SHED
FULLERS CORNER
EAST CENTRAL
BULLOCKS CORNER
ENGINEER POND
ENGINEER ROAD
N
W
E
S
SOUTH CENTRAL
WESTERN
LIBERTY CORNER
TRAVIS LAKE ROAD
CANOEING
STUART CORNER
UPPER TRAVIS LAKE
JAMBOREE HEADQUARTERS
STAFF TENTS
INFORMATION
PARKING
CUB SCOUT RECEPTION
PARKING
TO STATE HWY 2
SECONDARY ENTRANCE (VILLEBORD) (GATE 2)
SOUTHEAST
FISH HOOK LAKE
THOMAS ROAD
ARENA
PICNIC AREA
NORTHEAST
TRADING POST HQ & WAREHOUSE
NORTH CENTRAL
RTE 617 POST ROAD
POST ROAD
STAFF TENTS
INFORMATION
CUB SCOUT RECEPTION
MAIN ENTRANCE (GATE 1)
PARKING
PARKING
TO US TO U.S. HWY 301
SCALE IN FEET
0
1000
2000
3000

FENCED AREA CONTAINING FORMERLY USED HERBICIDE STORAGE SHED



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

REPLY TO ATTENTION OF

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/HSHB-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

DOCUMENT 3
40

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;*

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.

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 post 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.

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY Dr. Heller/mb/AUTOVON
ABERDEEN PROVING GROUND, MARYLAND 21010 584-3651

REPLY TO ATTENTION OF
HSHB-ES-H

6 JUL 1984

SUBJECT: Phase 1, 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

Commander
USA Training and Doctrine Command
ATTN: ATMD
Ft Monroe, VA 23651

1. AUTHORITY. 1st Ind, ATMD, HQ TRADOC, 13 September 1983, to Ltr, HSHB-E/WP, this Agency, 16 August 1983, subject: USAEHA Mission Service, FY 84.

2. REFERENCE:

a. Title 40, Code of Federal Regulations (CFR), 1983 rev, Part 261, Identification and Listing of Hazardous Waste.

b. McConnell, E. E., et al., Dioxin in Soil: Bioavailability After Ingestion by Rats and Guinea Pigs, Science, Vol 223, pp 1077-1079, 9 March 1984.

c. Blair, Etcyl H., ed, Chlorodioxins - Origin and Fate, Advances in Chemistry Series, No. 120, American Chemical Society, Washington, DC, 1973.

3. PURPOSE. To conduct environmental sampling and analysis in and around Building 225, the old herbicide storage area, to determine the extent of herbicide contamination and recommend remedial action if deemed necessary.

4. GENERAL. Building 225 at Fort A. P. Hill was used between 1962 and 1978 for storage of the herbicides silvex [2-(2,4,5,-trichlorophenoxy) propionic acid], 2,4-D (2,4-dichlorophenoxyacetic acid), and 2,4,5-T (2,4,5-trichlorophenoxyacetic acid). An environmental sampling and analysis study was, therefore, undertaken to determine the extent, if any, of herbicide contamination in and around the building and in the surface runoff areas adjacent to the building.

5. FINDINGS AND DISCUSSION.

a. Ten samples were collected for herbicide analysis. They consisted of the following:

Attached: extracted pages 3 and enclosure

6 JUL 1984

HSHB-ES-H
SUBJECT: Phase 1, 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

7. RECOMMENDATIONS. The following recommendations are based on good environmental engineering practice.

a. Remove the soil beneath Building 225 to a depth of 2 feet, place in Department of Transportation-approved 55-gallon drums, and send to an EPA or State-approved landfill for disposal.

b. Remove the soil from the downslope drainage area (within the fence) behind Building 225 to a depth of 6 inches and treat as in 7a above.

c. Backfill the excavated areas with an impermiable clay and then cover with grass where feasible.

d. The disposition of contaminated wood flooring in Building 225 should await a decision on the proposed fate of the building.

e. Prior to removal and disposal of contaminated soil, take and analyze samples for dioxin content, specifically 2,3,7,8-TCDD and HCDD. Analyze samples of the wood flooring for dioxins along with the soil.

f. Following removal of soil and prior to backfilling, take samples from the excavated areas for herbicide analysis to determine if cleanup was adequate. Dioxin analysis should only be performed on these samples if the initial soil sampling was positive for these compounds.

8. This Agency will continue to provide consultative assistance regarding further sampling and potential cleanup. Questions regarding this report should be referred to Chief, Waste Disposal Engineering Division, this Agency, AUTOVON 584-3651.

FOR THE COMMANDER:

1 Incl
as

JAMES M. STRATTA, Ph.D, P.E.
LTC, MSC
Acting Director, Environmental Quality

CF:
HQDA (DAEN-ZCF-U)
HQDA (DAEN-ZCE)
HQDA (DASG-PSP)
Cdr, TRADOC (ATEN)
Cdr, HSC (HSCL-P)
Comdt, AHS (HSHA-IPM)
Cdr, WRAMC (PVNTMED Svc)
Cdr, MEDDAC, FT Belvoir (PVNTMED Svc) (2 cy)
C, USAEHA-Rgn Div North

PHASE 1, 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

RESULTS OF HERBICIDE ANALYSIS, BUILDING 225, FORT A. P. HILL, VIRGINIA

Sample Location	Substrate	Concentration of Herbicide Detected
Building 225, flooring, left side	wood	0.48% - 2,4-D 1.83% - silvex 0.25% - 2,4,5-T
Building 225, flooring, right side	wood	0.44% - 2,4-D 166 ppm - silvex 0.12% - 2,4,5-T
Background, building 225, front	soil	0.09 ppm - 2,4-D 0.66 ppm - silvex 0.28 ppm - 2,4,5-T
Building 225, right-side drainage, outside fence	soil	0.3 ppm - 2,4-D 1.46 ppm - silvex 0.25 ppm - 2,4,5-T
Building 225, center drainage, outside fence	soil	0.38 ppm - silvex 0.12 ppm - 2,4,5-T
Building 225, right-side drainage, inside fence	soil	0.17 ppm - silvex 0.01 ppm - 2,24,5-T
Building 225, center drainage inside fence	soil	0.48 ppm - 2,4-D 25.8 ppm - silvex 2.16 ppm - 2,4,5-T
Building 225, left-side opening, under building	soil	90.1 ppm - 2,4-D 2.37 ppm - silvex 216 ppm - 2,4,5-T
Building 225, right-center opening, under building	soil	0.17% - 2,4-D 0.43% - silvex 0.13% - 2,4,5-T
Building 225, right-center opening, under building	unknown powder	<10 ppm - 2,4,-D < 5 ppm - silvex < 5 ppm - 2,4,5-T

* Lower limits of detectability for herbicides in the various substrates are:

Substrate	Herbicide	Lower Limit of Detectability (ppm)
wood	2,4-D	1.0
	silvex	0.4
	2,4,5-T	0.4
soil	2,4-D	0.01
	silvex	0.004
	2,4,5-T	0.004
unknown powder	2,4,-D	10
	silvex	5
	2,4,5- T	5

for Donald J. Kippenberger

DONALD J. KIPPENBERGER
CPT, MSC
Chief, Pesticide Analysis Br
Organic Environmental Chemistry Div

PRIORITY

PT J0224 320/1501Z PAGE 01

	A	I		A	I		A	I		A	I		A	I	
ATBG			ATIE			ATMD			INS			ISC			RT:
ATCD			ATAM			ATCH			NSW			PHQ			SP:
ATDO			ATCS			ATPA			TCF			TCC			XR:
ATRO			ATCM			ATJA			FMR			SSD			NC:
ATRM			ATCE			ATFE			DAR			MRE			QC:
ATPL			ATIG			ATIR			EOC			RF			
ATEN	2														

PTTUZYUW RUEADWD 9546 3201457-UUUU--RUCLAIA.

ZNR UUUUU

P 132025Z NOV 84

FM HQ DA WASHDC //DAEN-ZCE/DAEN-ZCF//

TO RUCLAIA/COR TRADOC FT MONROE VA//ATEN//

INFO RUE04GA/COR FT LEE VA

RUEOAGB/COR FT AP HILL BOWLING GREEN VA

BT

UNCLAS

SUBJECT: EXPEDITED CLEAN-UP OF DIOXIN CONTAMINATION AT FT A.P. HILL, VIRGINIA

1. THE FOLLOWING GENERAL AND SPECIFIC MEASURES FOR ADDRESSING DIOXIN CONTAMINATION IN THE VICINITY OF MAHONE CAMP, FORT A.P. HILL WERE DEVELOPED DURING MEETINGS ON 8-9 NOVEMBER BETWEEN INSTALLATION, MACOM, AND HQDA PERSONNEL AND REPRESENTATIVES OF USEPA, COMMONWEALTH OF VIRGINIA, AND THE BOY SCOUTS OF AMERICA (BSA), AND HAVE BEEN INDORSED BY THE ACTING ASSISTANT SECRETARY OF THE ARMY FOR INSTALLATIONS AND LOGISTICS.

A. SECURE AND MARK THE FORMER HERBICIDE STORAGE BUILDING (BLDG 22) AND THE AREA DOWN SLOPE FROM THE BUILDING. TAKE APPROPPIATE MEASURES FOR INCREASED SURVEILLANCE.

B. COORDINATE INITIAL AND FOLLOW-UP SAMPLING AND LABORATORY

PRIORITY

PAGE 02 RUEADWD9540 UNCLAS

TESTING AND CLEAN-UP PLANS WITH EPA, CENTERS FOR DISEASE CONTROL (CDC), STATE OFFICIALS AND BOY SCOUTS OF AMERICA, AS APPROPRIATE.

C. ASSURE EPA AND CDC VALIDATION OF FUTURE LABORATORY ANALYSES BEFORE MAKING RESULTS PUBLIC.

D. COORDINATE WITH CDC FOR ASSESSING POSSIBLE HEALTH RISKS TO EXPOSED PERSONNEL.

E. DEVELOP A PUBLIC RELATIONS PROGRAM IN COORDINATION WITH SAPA.

G. TAKE APPROPRIATE MEASURES TO PREPARE TO STORE CONTAINERIZED DIOXIN CONTAMINATED SOIL AND DEBRIS ON FT A.P. HILL PENDING DEVELOPMENT OF EPA APPROVED DISPOSAL PROCEDURES.

2. THESE MEASURES SHOULD NOT BE CONSIDERED ALL-INCLUSIVE NOR A PREEMPTION OF SUBORDINATE COMMAND AUTHORITIES. OTHER IMMEDIATE OR LONG TERM STEPS SHOULD BE TAKEN AS CONDITIONS DICTATE, HOWEVER, DUE TO THE SENSITIVITY OF THE MATTER AND COMMITMENTS MADE BY THIS HEADQUARTERS, ANY SIGNIFICANT DEPARTURE FROM THE MEASURES DESCRIBED ABOVE SHOULD BE COORDINATED IN ADVANCE WITH HQDA.

3. A COMMITMENT HAS BEEN MADE BY OSA TO BSA TO HAVE CLEAN UP COMPLETED BEFORE THE 1985 NATIONAL JAMBOREE. ANY DIFFICULTIES IN COMPLETING CLEAN UP ACTIVITIES AND VERIFICATION OF EFFECTIVENESS PRIOR TO 1 APRIL 1985 SHOULD IMMEDIATELY BE RAISED TO THIS HQ.

PAGE 03 RUEADWD9540 UNCLAS

ATTENTION DAEN-ZCF.

BT

#9548

PRIORITY

SCOUTING/USA

A program for Cub Scouts, Boy Scouts, and Explorers

National Office
BOY SCOUTS OF AMERICA

1325 Walnut Hill Lane, Irving, Texas 75062-1296
Telephone: 214 659-2000

RECEIVED
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Cofs PWT 11
DCG
CG V 11/12
LF: ACE (Env. Office)
: Bill Drobnick -
PAT - BSA POC

December 5, 1984

Lt. General E. R. Heiberg, III
Commander/Chief of Engineers
U. S. Army Corps of Engineers
Washington, D. C. 20314

Dear Lt. General Heiberg:

Enclosed are copies of biographical information on Guy & Davis, Consulting Engineers, the Sampling Plan prepared by them and a report by me on the actions to date. These were presented to the Steering Committee for the 1985 National Scout Jamboree at the AMFAC Hotel, DFW Airport, December 4, 1984.

Pat Hilliard, Assistant Secretary of the Army, Lt. C. Chick Wilson, Assistant to the Assistant Secretary of the Army, and Gordon Hobbs, Assistant Secretary of the Army for Real Properties, also attended this meeting. Mr. Hilliard provided a briefing on the U.S. Army's position regarding the dioxin contamination at Fort A. P. Hill. Mr. Hilliard indicated that 360 samples were being taken by EPA and that results of these samples will not be final for approximately 30 days; although some preliminary information may be available within the next 7-10 days.

In view of the fact that the results of the tests are not final, a final decision on whether or not the Jamboree will be held at Fort A. P. Hill was not made. The consensus of the committee was that the Jamboree will be held at Fort A. P. Hill if the test results are favorable to this action.

I will keep you informed as further action occurs.

Sincerely,

Joe F. Banks
Director
Engineering Service

JFB/tb 1016o

Enclosures

DOCUMENT 6

LEWIS & GUY REPORT
For
December 4, 1984 Meeting
Prepared by Joe F. Banks

- Guy & Davis were employed on the recommendation of Harry Bovay. They were employed on November 10, 1984, that was the day after the US Army briefing in the Pentagon.

- The contract calls for them to investigate and report to the Boy Scouts of America on the:
  1. Extent and degree of dioxin contamination at the Jamboree site at Ft. A. P. Hill

  2. Related impact on those attending the 1981 Jamboree

  3. Potential impact on those attending the 1985 Jamboree

- Lewis Guy began work on Tuesday, November 13 at Ft. A. P. Hill. He would have begun on Monday, but Ft. A. P. Hill offices were closed on that day.

- He attended a meeting on November 15 in which the EPA and CDC established the criteria and procedures for all dioxin tests.

  Guy & Davis then prepared a sampling plan for determining the extent of contamination in the Jamboree area and submitted it to EPA for approval on November 27.

  The plan calls for 21 soil samples and 2 well samples for a total of 23 samples.

  Guy & Davis selected subcontractors for implementing this plan and these subcontractors were also approved by EPA.

The subcontractor for taking the samples is

Ecology & Environment, Inc.
195 Sugg Road
P. O. Box D
Buffalo, New York 14225
John A. Duwaldt, Biologist

The subcontractor for analyzing the samples is

California Analytical Labs, Inc.
2544 Industrial Boulevard
West Sacramento, California 95691
916-372-1393
Dr. Mike Miille

The 23 samples were taken on November 29 and 30 by our Buffalo subcontractor in coordination with the sampling program conducted by EPA for the US Army. Each of our samples were split, one half for EPA and one half for us.

The samples were sent to our California subcontractor by Federal Express on November 30. Lewis Guy informed me today that they were received in California yesterday, and that our subcontractor has begun their analysis work.

He assures me that we will have a complete report in 30 days and possibly have preliminary verbal information sooner.

JB/1009o/tb

SAMPLING PLAN

FOR THE BOY SCOUTS OF AMERICA

TO DETERMINE EXTENT OF 2, 3, 7, 8-TCDD

CONTAMINATION IN AND AROUND BLDG. 225

AT FORT A. P. HILL, VIRGINIA

prepared by

Guy & Davis, Consulting Engineers
5200 Rolling Road
Burke, Virginia 22015

November 27, 1984

I. INTRODUCTION

This sampling plan for dioxin has been developed to provide data to the Boy Scouts of America for an independent evaluation of the level and extent of dioxin contamination in the vicinity of Building 225 at Ft. A. P. Hill, Bowling Green, Virginia. The more extensive dioxin sampling program being conducted by the U.S. Army Environmental Hygiene Agency (AEHA) and the Environmental Protection Agency (EPA) will be used in conjunction with the Boy Scouts sampling and analysis to:

(1) Determine the extent and degree of dioxin contamination.

(2) Evaluate any related impacts on the Scouts attending the 1981 Jamboree.

(3) Project any potential impact on Scouts who may attend the proposed 1985 Jamboree.

The sampling plan provides primarily for surface soil, and core samples to be taken in and adjacent to the known dioxin contaminated area.

The following sites in and around Buildings 224 and 225 will be sampled:

Site	Number of Samples
Under Building 225	6
Under Building 224 Shed	1
Midline of gate to Buildings 224 and 225	1
Fence Line (outside) around Buildings 224 and 225	6
Drainage area downslope of Building 225	5
Background (soil)	2
Background (to nearest wells—7 and 7A)	2
EPA spiked sample (to be supplied)	1
	23

II. SAMPLING PLAN

A. General

The following sampling plan is an attempt by the Boy Scouts to provide an independent evaluation of the level and extent of dioxin contamination in and around Buildings 224 and 225 at Ft. A. P. Hill. This sampling and analysis program will be supplemented by a more extensive sampling program by the federal government and data from both efforts applied to both a human health and remedial action review. The plan outlined here is a guide and shall be adhered to as best practical. However, it is anticipated that some alterations or amendments may be necessary based on best field judgment of the sampling team.

Attached to the written sampling plan are maps of these areas showing the government's sample locations and, superimposed in red, those proposed for the Boy Scouts program. All sampling points will be horizontally located in the field, prior to any sampling. All points will be marked by means of survey stakes, or in some manner that sampling locations can be easily identified. In general, two types of samples will be taken at the majority of points; surface and core samples. All core type samples obtained will be cut into either 4-inch or 1-foot segments and each segment will be considered as a discrete sample.

In the event that the specified depth cannot be achieved, the sample will either be submitted for achievable depth or the sampling point will be moved to the closest suitable location. In all cases this decision will be made by the on-site representative in consultation with the sampling team leader.

In addition to the attached sampling plan, the following general comments apply:

(1) All sampling techniques, documentation, blending, decontamination, and laboratory analysis will be performed according to standard protocol and the most recent revision of the EPA Region VII dioxin protocol entitled "Determination of 2,3, 7, 8-TCDD in Soil and Sediment."

(2) Split samples will be provided to the EPA or AEHA or their designated representative upon request.

(3) All samples collected will have the same priority for analysis.

B. Sampling Locations and Procedures

(1) Under Building 225. Four core samples will be taken under Building 225 (see diagram 1). Two of the core samples, in bays 2 and 3 are to be driven to a depth of 4 feet. The cores will be split in two segments (0-4 inches and 36-48 inches). Each of the two segments are to be treated as discrete samples and will be homogenized. The other two core samples will be driven to a depth of 4 inches, homogenized and anaylzed. Total number of samples taken = 6.

(2) Under Building 224 (open shed section). One core sample is to be taken inside the door facing Building 225 (see diagram 2). The depth of this sample is to be a 0-4 inch core. Total number of samples taken = 1.

(3) Midline of Gate to Buildings 224 and 225. One 0-4 inch core sample is to be taken midline of the entrance gate to Buildings 224 and 225 (see diagram 3). Total number of samples taken = 1.

(4) Fence Line (outside) around Buildings 224 and 225. Six 0-4 inch core samples are to be taken (see diagram 3) just outside the fence around Buildings 224 and 225, starting at the northeast corner post, midway of Building 225, midway of northeast and northwest corner post, northwest corner post (corner closest to Building 227), and along fence (furthest from Building 225), midway to Building 224. Total number of samples = 6.

(5) Drainage area down slope of Building 225. Five 0-4 inch cores are to be taken between Buildings 225 and 229 (see diagram 4), the convex of the drainage ditch at the corner of Building 229, and the culvert at the road. Total number of samples = 5.

(6) Background samples (soil).

(a) One 0-4 inch core at second base of the baseball diamond northwest of the fenced area (see diagram 5).

(b) One 0-4 inch core adjacent to Building 226 and near the dead peach tree (see diagram 5).

Total number of samples = 2.

(7) Background samples (water). The two nearest wells to the dioxin site are to be sampled from each well head prior to treatment and analyzed for dioxin—wells 7 and 7A (see diagram 6). Total number of samples = 2.

(8) "Spiked" sample will be furnished by EPA in accordance with their laboratory quality control program (QAQC).

DEPARTMENT OF THE ARMY Dr. Heller/kb/AUTOVON
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY 584-3651
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ES-H

11 DEC 1984

SUBJECT: 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

Commander
US Army Training and Doctrine Command
ATTN: ATMD
Fort Monroe, VA 23651

1. Reference:

a. 1st Ind, ATMD, HQ TRADOC, 13 September 1983, to Letter, HSHB-E/WD, this Agency, 16 August 1983, subject: USAEHA Mission Services, FY 84.

b. Meeting among representatives from CDC, EPA, Commonwealth of Virginia, Boy Scouts of America (Guy and Davis Engineers), HQ TRADOC, Fort A. P. Hill and this Agency, 15 November 1984, SAB.

c. Letter from Department of Health and Human Services, November 26, 1984.

2. Purpose. To provide the final sampling plan to define dioxin contamination at Fort A. P. Hill.

3. A draft sampling plan was prepared by Agency and EPA personnel and staffed with the CDC for review and comment after the 15 November 1984 meeting (reference 1b). A revised plan which incorporated CDC comments was then resubmitted on 23 November 1984. The inclosed final sampling plan incorporates the additional comments made in reference 1c to the second sampling plan and addresses all CDC concerns.

4. Field sampling was conducted at Fort A. P. Hill utilizing USEPA contractor personnel from 27 November - 6 December 1984. All environmental samples collected have been submitted to USEPA approved laboratories for dioxin analysis.

HSHB-ES-H
SUBJECT: 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

5. Questions concerning this matter may be referred to Dr. Jack M. Heller or Chief, Waste Disposal Engineering Division, this Agency, AUTOVON 584-2024.

FOR THE COMMANDER:

KARL J. DAUBEL
Colonel, MS
Director, Environmental Quality

Incl
as

CF:
HQDA (DAEN-ZCF-U)
HQDA (DAEN-ZCE)
HQDA (DASG-PSP)
Cdr, TRADOC (ATEN)
Cdr, HSC (HSCL-P)
Comdt, AHS (HSHA-IPM)
Cdr, WRAMC (PVNTMED Svc)
Cdr, Ft Lee (ATZM-E)
Cdr, Ft A. P. Hill (ATZM-FHE-E)
Cdr, MEDDAC, Ft Belvoir
C, USAEHA-Rgn Div North
Guy and Davis Engineers
US EPA Region III (Dr. Lee)
Centers for Disease Control

SAMPLING PLAN TO DETERMINE EXTENT OF 2,3,7,8-TCDD

CONTAMINATION AT FORT A. P. HILL, VIRGINIA

PREPARED BY: JACK M. HELLER, Ph.D.
Environmental Scientist
Waste Disposal Engineering Div
US Army Environmental Hygiene
Agency
Aberdeen Proving Ground, MD

APPROVED BY: WALTER LEE, Ph.D.
Environmental Scientist
Dioxin Technical Coordinator
US Environmental Protection
Agency, Region 3

I. INTRODUCTION

This plan has been developed in an attempt to provide sound data with regards to the level and extent of dioxin contamination at Ft A. P. Hill, VA. Although all samples taken will be split for possible priority pollutant analysis, the timing and other considerations discussed herein are limited to 2,3,7,8-TCDD determination. The data collected in this study will be utilized to determine potential adverse impacts to health and also to develop subsequent site studies and remedial action alternatives. This sampling plan provides primarily for surface soil, auger and core samples to be taken at various areas throughout Ft A. P. Hill. The sampling locations were chosen based on two criteria: first, areas of concern as identified during the Phase I and II US Army Environmental Hygiene Agency (AEHA) studies, the second, areas where the Boy Scouts camped or had activities during the 1981 Jamboree and will camp and have activities during the upcoming 1985 Jamboree.

The following sites in and around Buildings 224 and 225 will be sampled:

Site	Number of Samples
Building 225	4
Building 224	5
Under Building 225	44
Under Building 224 Shed	4
Fence Line (inside) around Buildings 224 and 225	24
Inside fenced area of Buildings 224 and 225	14
Drainage area downslope of Building 225	62
Background	28
Transportation area	14

The following additional area of Ft A. P. Hill will also be sampled:

(1) Drinking water - all wells

(2) Ground water - contaminated area (around Buildings 224 and 225). Siting and number of wells to be determined once area of contamination is completely defined.

(3) Scout camp sites and activity areas - minimum of 5 samples per identifiable site.

(4) Past silvex and 2,4,5-T treatment sites (if any) that are in Boy Scout areas - minimum of 5 samples per identifiable site.

(5) Other possible silvex and/or 2,4,5-T storage areas - analyzed for insecticides and herbicides first on a lower priority schedule; analyze for dioxin if silvex or 2,4,5-T is found.

II. SAMPLING PLAN

A. General

The following sampling plan has been developed in an attempt to provide sound data which may be applied to both a human health and remedial action review. The plan outlined here is a guide and shall be adhered to as best practical. However, it is anticipated that some alterations or amendments may be necessary based on best field judgement of the sampling team.

For the purpose of this sampling plan the site has been divided into several areas. Each of these areas of concern are addressed separately in the sampling plan. Attached to the written sampling plan are maps of these areas showing proposed sample locations. All sampling points will be horizontally located in the field, by means of survey, prior to any sampling. All points will be marked by means of survey stakes, or in some manner that sampling locations can be easily identified. In general, two types of samples will be taken at the majority of points; surface and core samples. All core type samples obtained will be cut into either 6-inch or 1-foot segments and each segment will be considered as a discrete sample. At other locations, hand auger samples will be taken. Surface samples are defined as a 0-4 inch composite unless specifically stated otherwise.

In the following sampling sections different auger or core depths are specified. In the event that the specified depth cannot be achieved, the sample will either be submitted for achievable depth or the sampling point will be moved to the closest suitable location. In all cases this decision will be made by the EPA or AEHA onsite representative in consultation with the sampling team leader.

In addition to the attached sampling plan, the following general comments apply:

(1) All sampling techniques, documentation, blending, decontamination, and laboratory analysis will be performed according to standard protocol and the most recent revision of the EPA dioxin protocol entitled "Determination of 2,3,7,8-TCDD in Soil and Sediment" as set forth in the Statement of Work for the EPA Contract Laboratory Program. All samples will be analyzed in laboratories certified by EPA.

(2) Split samples will be provided to the Boy Scouts of America or their designated representative upon request.

(3) AEHA and EPA will determine the priority of sample analyses and the need for additional samples or analyses. Adjustments may be required as sample data become available.

B. Sampling Locations and Procedures

(1) Building 225. Two composite samples will be obtained in Building 225. A sample of dust vacuumed from the wooden flooring will be combined for one sample and dust from the wall beams and supports will be

collected for the second sample. Additionally, a solvent wipe sample will be taken from the floor prior to vacuuming and a solvent wipe sample taken from the beams prior to collection of that dust sample. Total number of samples taken = 4; total number to be analyzed = 4.

(2) Building 224. One composite sample of dust will be collected in Building 224, which is in the same fenced area as Building 225. Dust will be collected from the tops of metal cabinets and a refrigerator in this building. Four solvent wipe samples will be taken in appropriate areas of the building. Total number of samples taken = 5; total number of samples to be analyzed = 5.

(3) Under Building 225. Twelve core samples will be taken under Building 225 (see diagram 1). The four core samples at the downgradient end of the building are to be driven to a depth of 4 feet. The cores will be split into 4 - one foot segments with the exception of the first foot, which will be divided into a 0-4 inch (surface) and 4 - 12 inch segments. Each segment will be treated as a discrete sample and will be homogenized. The other eight cores will be driven to a depth of 2 feet and each core divided into a 0-4 inch, 8-12 inch, and 12-24 inch segment for analysis. Total number of samples taken = 44; total number to be analyzed = 36 on a high priority basis (the top 2 feet of each core) the other 8 on an as-needed basis.

(4) Under Building 224 (open shed section). Four core samples are to be taken under the open shed portion of Building 225 (see diagram 2). The depth of each of these samples is to be a 0-4 inch core. Total number of samples taken = 4; total number to be analyzed = 4.

(5) Fence line around Buildings 224 and 225. Fifteen core samples are to be taken just inside the fence line surrounding Buildings 224 and 225 (see diagram 3). Starting at the northeast corner fence post (near Building 224) take core samples at 2 fence post intervals (4 samples), 3 fence post intervals (1 sample), and then 50 foot intervals (2 samples) along the down slope fence line. These core samples are taken to a depth of 1 foot and divided into 0-4 and 4-12 inch intervals for analysis. Two more core samples of this depth are taken on the fence line farthest away from the buildings and divided as above for analysis. Zero to four inch core samples are then taken the rest of the way around the fence line at 50 foot intervals (4 samples) except for the gate side of the fence line. Here one 0-4 inch core is taken one foot inside each gate post. Total number of samples taken = 24; total number of samples to be analyzed = 24.

(6) Inside fenced area containing Buildings 224 and 225. Core samples corresponding to those along the down slope fence line are taken parallel to and just inside the drainage diversion ditch (see diagram 3). They are 1 foot in depth and divided into 0-4 and 4-12 inch intervals for analysis. Two more core samples (0-4 inch) are taken in the fenced area. These are midline of the area and in line with the two telephone poles in the area. Total number of samples taken = 14; total number of samples to be analyzed = 14.

(7) Drainage area down slope of Building 225. Twelve 2 foot core samples are to be taken midline with the 4 open bays under Building 225 (see diagram 4). The samples are to be taken at 30 and 60 foot distances from the down slope fence line of Building 225 and just in front of the drainage ditch near Building 229. Cores are to be divided into 0-4 inch, 4-12 inch, and 12-24 inch segments for analysis. Nine core samples (1 foot depth) are then to be taken, in line with the last 3 down slope fence line samples and at the same distances from the fence as above. Core samples are to be divided into 0-4 inch depth and 4-12 inch depth intervals for analysis. Core samples (1 foot depth) are to be taken in the drainage ditch starting at the corner where it turns toward the road and every 50 feet until it reaches the culvert at the road. Core samples are divided as above for analysis. Total number of samples taken = 59; total number of samples to be analyzed = 59. High priority samples are all 0-4 inch depths and 4-12 inch depths of the samples in line with Building 225.

(8) Background samples. Twenty-five background core samples are to be taken for analysis (see diagram 5). All background cores are 4 inch depth except for the one midway between Building 228 and the road which is 1 foot in depth with 0-4 inch and 4-12 inch sampling intervals for analysis. Background samples are to be taken in the following areas:

(a) Outside the barbed wire on the gate side of the fence line - 3, one in line with each telephone pole.

(b) One in each of the small grassy areas east of Building 224.

(c) Two at the edge of the woods east of Building 225. One in line with the drainage ditch and the other in line with the northeast fence post near Buiulding 225.

(d) Two off the southwest corner of the fenced area. One 50 feet from the corner fence post, the other 50 feet further out in the same line where the ground dips into a low area.

(e) One at home plate and one at second base of the baseball diamond northwest of the fenced area.

(f) One between Building 228 and the road.

(g) Nine in the field west-northwest of the fenced area (see diagram 5).

(h) Six in the field/woods to the southwest of the fenced-in area; two on the west-southwest radial at 50 foot intervals from the fence, two on the south-southwest radial at 50 foot intervals from the fence, and two on the south radial at 50 foot intervals from the fence.

Total number of samples taken = 28; total number of samples to be analyzed = 28.

(9) Transportation and Samples. Fourteen surface samples to be taken in the hardpan/gravel area east of the fenced area (see diagram 5). These samples will consist of two samples each at 150 foot intervals from the fence on the south-southeast, east-southeast, east, east-northeast and north-northeast radials. It is anticipated that field conditions will prohibit collection of many of these samples. Building 226 in this area will be solvent wipe sampled (4). Total number of samples taken = 14; total number to be analyzed = 14.

(10) Drinking Water. All the drinking water wells on Ft A. P. Hill are to be sampled and analyzed for 2,3,7,8-TCDD and the priority pollutants. Samples taken for analysis are to be drawn directly from the well heads prior to any treatment.

(11) Boy Scout camping and activity areas. All areas where Boy Scouts camped or had activities during the 1981 Jamboree and all areas to be used by the Scouts in the 1985 Jamboree will be sampled for dioxin contamination (see Maps 1 and 2). The following samples will be taken from Boy Scout areas:

(a) Subcamp sites (18) used during the 1981 Jamboree:

(1) One composite consisting of an aliquot from each shower location in the area.

(2) One composite consisting of at least 5 aliquots from the Headquarters portion of the area.

(3) One composite consisting of at least 5 aliquots from the cook tent portion of the area.

(4) Two composites of at least 5 aliquots each of the general area.

(b) New subcamp sites (2) to be used during the 1085 Jamboree:

Five composites of at least 5 aliquots each from the general area (these sites have no history to use the above sampling scheme).

(c) Scout Jamboree Headquarters:

Five composite samples of at least 5 aliquots each from general areas.

(d) Thomas Road (between Lee Drive and Gorton Trail, approximately 1¼ miles):

One aliquot each 100 yards taken at the bottom of the road-

side ditch (south side of the road). Each 5 aliquots form a distinct sample (total = 5 samples).

(e) New Parking Lot (55 Acres):

Five composite samples of at least 5 aliquots each to cover the total area. Sample location were at each of the 5 access roads to the parking lot (4 on Thomas Road and 1 on Lee Drive) and extended across the width of the parking area.

(f) Amphitheater:

Nineteen composites of at least 5 aliquots each to cover the total area (see Diagram 6 for exact sample locations).

All samples taken in the Boy Scout areas will be 0-4" cores.

(12) Past areas of silvex and 2,4,5-T application. Areas where 2,4,5-T and/or silvex were applied in the past, and that were or may have been used by the Boy Scouts, will be sampled for dioxin. The only area that falls into this catagory is the amphitheater (see Diagram 6 for sampling plan). In addition, several 2,4,5-T treatment areas from other areas of the installation will be sampled for dioxin contamination (see Map 3). A total of 21 composite samples (0-4" cores) consisting of at least 5 aliquots each, are to be taken from 6 designated treatment areas. The following number of composite samples will be taken from each area (see Map 3):

Area	Number of Samples
1	2
2	3
3	5
4	5
5	2
6	4

(13) Lake sampling. Lakes that were in or near the Boy Scout Jamboree area, that were used by the Boy Scouts for fishing, or that are in the drainage pattern of the dioxin contaminated area will be sampled. Two samples will be taken from each lake. They are:

(a) Bottom Feeding Fish (if possible), one composite sample of edible tissue, obtained by shocking.

(b) Sediment, one sample, at the influent to the lake. Sample site to be chosen in the field by the sampling team leader in conjunction with representatives from AEHA and EPA.

The lakes to be sampled are (see Map 2):

(a) Fish Hook Lake

(b) Bullock Lake

(c) Upper Travis Lake

(d) Lower Travis Lake

(14) Ground Water. When the area of dioxin contamination around Building 225 is completely defined, shallow ground-water monitoring wells will be installed by AEHA to ascertain if contamination of ground water has occurred. The siting of wells, number of wells to be installed, and the sampling protocol will be determined after a site visit by AEHA Ground Water and Solid Waste Branch personnel. Following completion of the ground-water monitoring plan, it will be submitted to The Centers for Disease Control and EPA for approval prior to the start of drilling. Ground water samples will be analyzed for dioxin and priority pollutants.

(15) Past silvex and 2,4,5-T storage areas. There are several areas suspected of having stored 2,4,5-T and/or silvex in the past (not in the Boy Scout areas) that requires investigation. These areas will be sampled (1 to 5 surface samples per site) and the samples analyzed for insecticides and herbicides to determine if there is a need for 2,3,7,8-TCDD analysis. If analysis shows the presence of detectable quantities of either 2,4,5-T or silvex, the samples that were taken for herbicide and insecticide analysis will then be analyzed for dioxin. Results of dioxin analysis will determine if further study is required in these areas. Sampling of these areas and insecticide/herbicide analysis of the samples will be conducted by AEHA personnel.

(16) Pesticide analysis. In addition to dioxin analysis, ten percent of all surface soil samples (0-4" cores) will be analyzed for pesticide content. This analysis will be performed at AEHA (if there is no dioxin in the sample) for routine chlorophenoxy herbicides and organochlorine/organophosphate insecticides.

(17) Soil characterization. Four samples of soil, surrounding and in close proximity to the contaminated zone, will be taken to a depth of 30 inches with Shelby tubes. The samples will be broken into horizons and analyzed for particle size distribution, Atterburg Limits and three-void permiability. This data will assist in predicting the behavior of dioxin in the soil.

III. PRIORITY OF SAMPLE ANALYSIS

There are only a limited number of soil samples that can be analyzed on a 7-day turn around basis. Approximately 90 samples can be analyzed on this priority level depending on laboratory space available. Samples selected for this priority analysis are:

(1) All samples in Building 225 - total 4

(2) All samples in Building 224 - total 5

(3) All samples under Building 224 shed - total 4

(4) Under Building 225, top 2 feet of each core - total 36 (3 sections in each core).

(5) All fence line samples around Buildings 224 and 225 - total 24

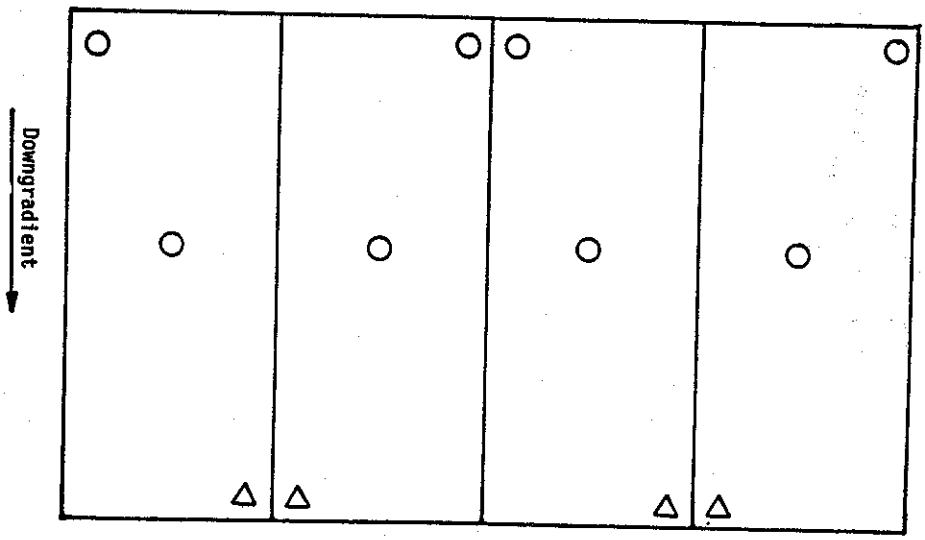
(6) All samples inside fenced area containing Buildings 224 and 225 - total 14

(7) Drainage area down slope of Building 225 - total 7 [four 0-6 inch core segments from the closest row (30 feet away) of sampling points down slope and in line with Building 225 and three 0-6 inch core segments from the next row (60 feet away) of sampling points in the same direction].

(8) Background samples - total 4 (2 at the edge of the woods east of Building 225 and one at home plate and one at second base of the baseball diamond northwest of the fenced area).

(9) All samples in Building 226 - total 4.

DIAGRAM 1 - Locations of core samples to be taken under Building 225.

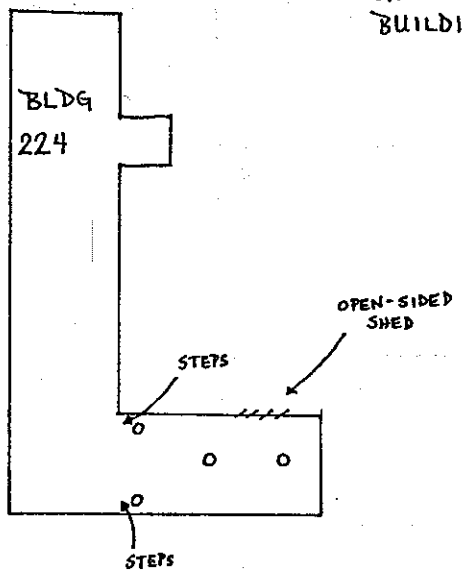


○ - Core sampling points - 2 feet total depth with 0-4", 4-12" and 12-24" sampling intervals for analysis.

△ - Core sampling points - 4 feet total depth with 0-4", 4-12", and then 1 ft. sampling intervals for analysis.

DIAGRAM. 2

SAMPLES TO BE TAKEN UNDER BUILDING 224.

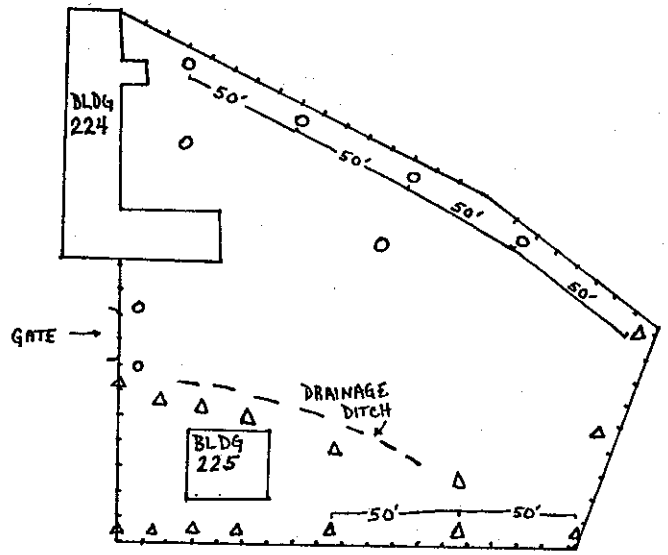


O SAMPLE POINTS - 0-4" DEPTH

2 cm = 20'

DIAGRAM 3

SAMPLES TO BE TAKEN AT FENCE LINE SURROUNDING BUILDINGS 224 AND 225, AND INSIDE FENCED AREA.



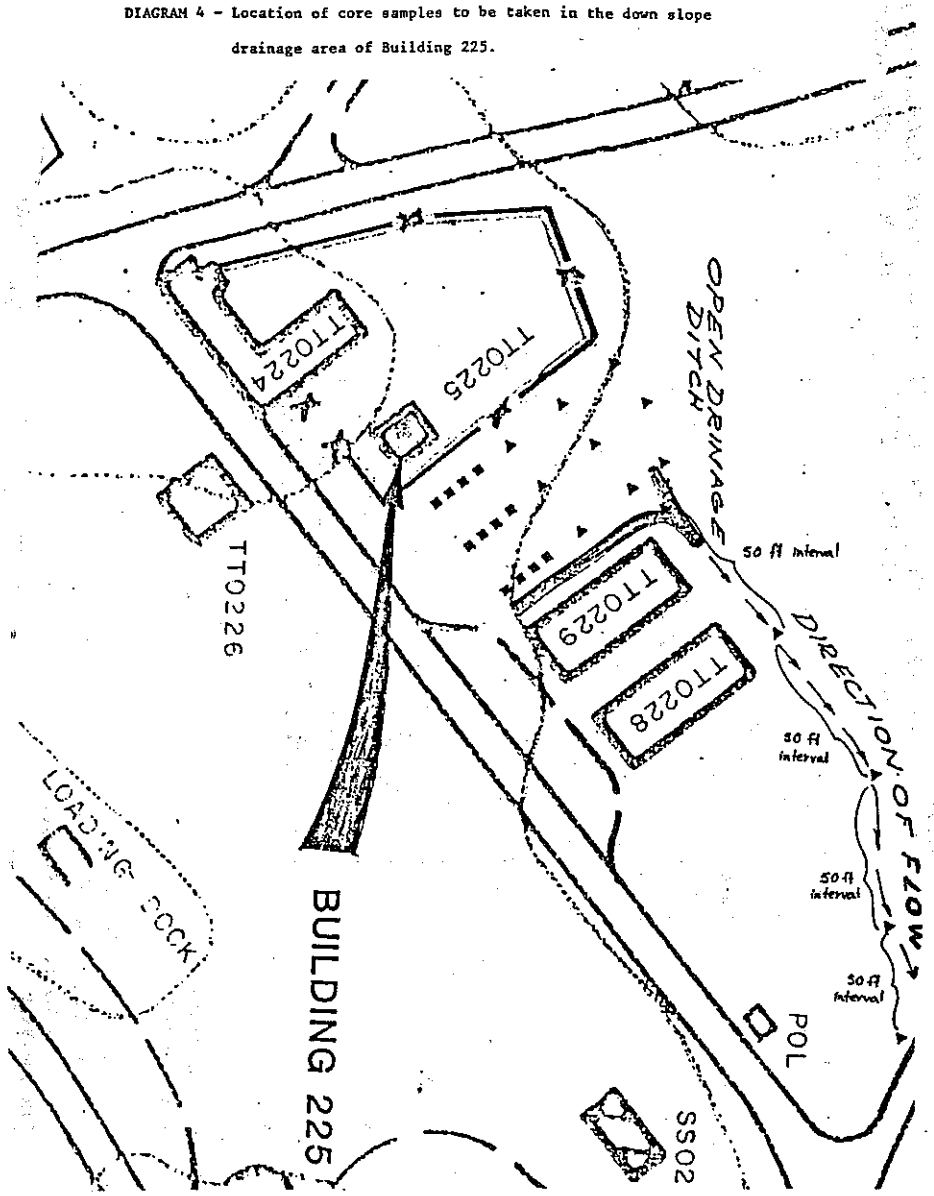
O CORE SAMPLING POINTS - 0-4" DEPTH

△ CORE SAMPLING POINTS - 1' TOTAL DEPTH WITH 0-4" AND 4-12" SAMPLING INTERVALS FOR ANALYSIS

FENCE

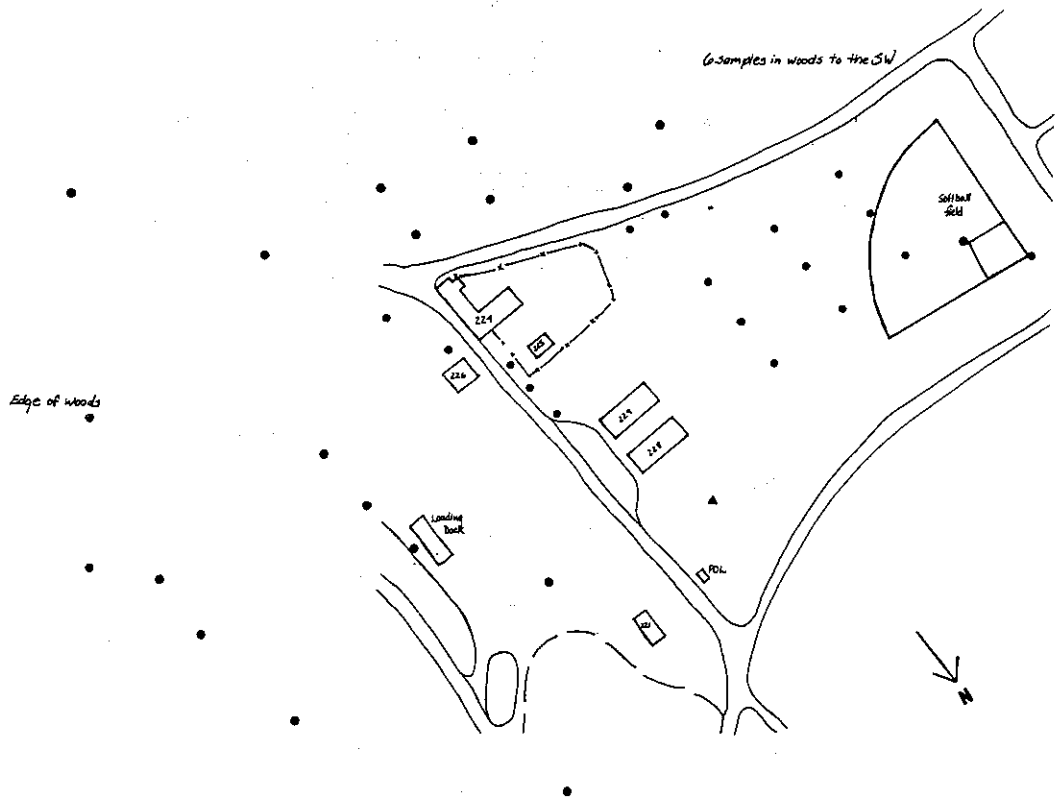
2cm = 40'

DIAGRAM 4 - Location of core samples to be taken in the down slope drainage area of Building 225.



▲- Core sampling points - 1foot total depth with 0-4" and 4-12" sampling intervals for analysis.
■ - Core sampling points - 2 feet total depth with sampling intervals for analysis of 0-4", 4-12", and 12-24".

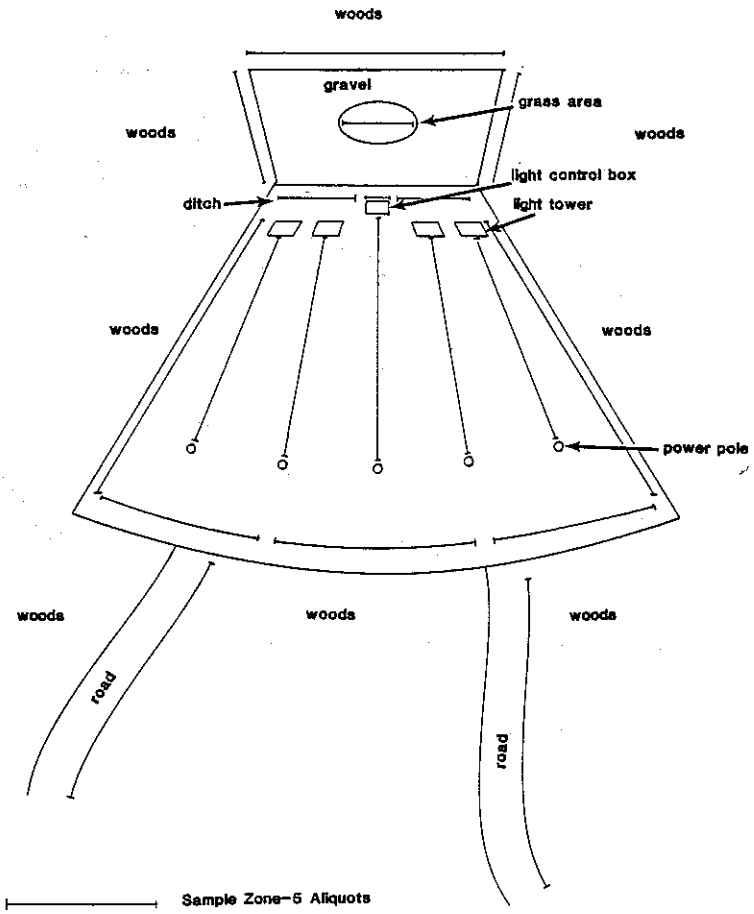
DIAGRAM 5 - Background and Transportation area sample locations.

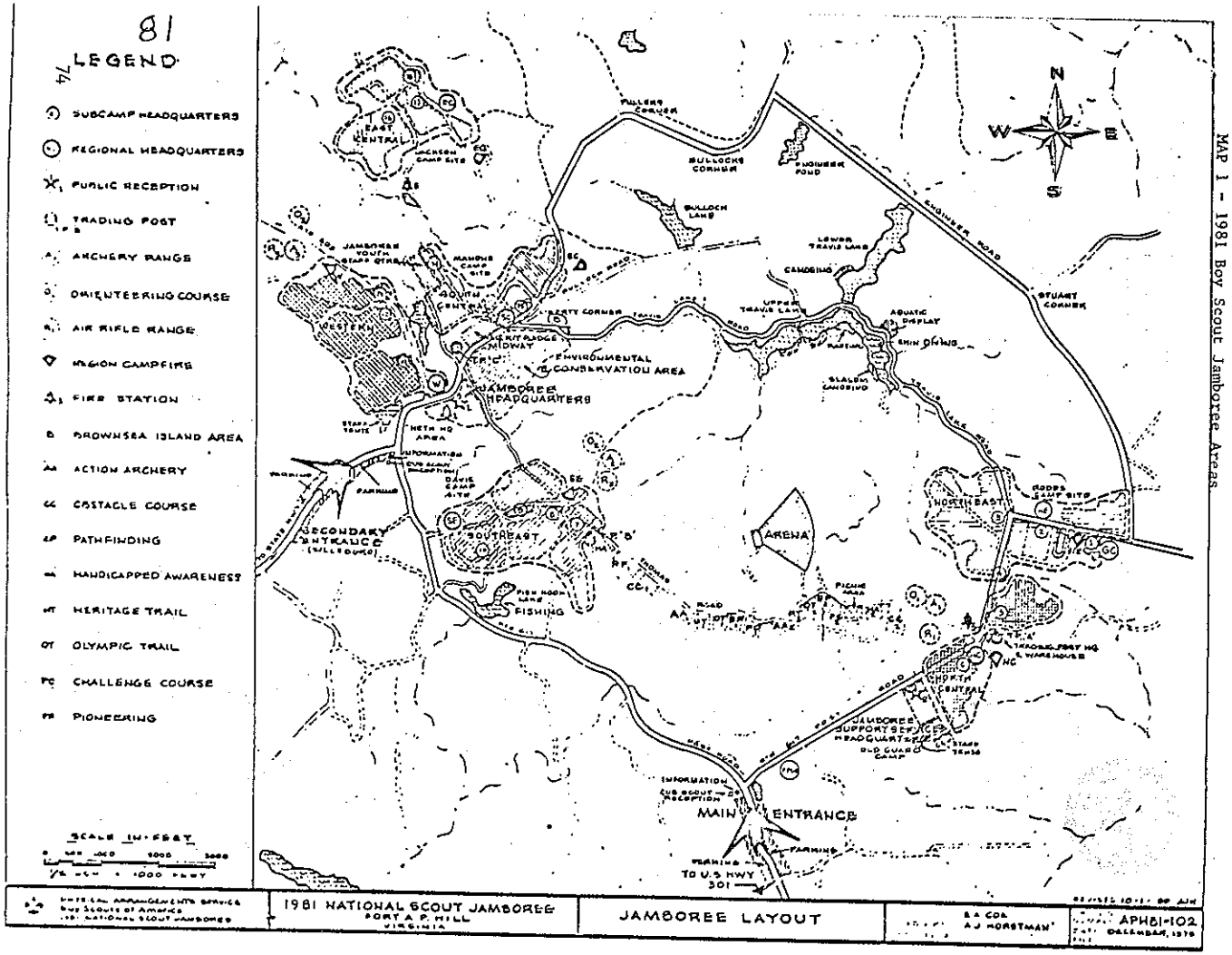


● - Core sampling points - 0 to 4 inch depth

▲ - Core sampling points - 1 foot total depth with 0-4" and 4"-12" sampling intervals

Diagram 6 Sampling Plan for Boy Scout Amphitheater





MAP 1 – 1981 Boy Scout Jamboree Areas

DEPARTMENT OF THE ARMY Mr. Bayha/mb/AUTOVON
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY 584-2024
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ES-G

17 JAN 1985

SUBJECT: Revised Plan for Ground-water Monitoring around Building 225, Fort A. P. Hill, Virginia (Ground-water Consultation No. 37-26-1376-85)

Commander
US Army Training and Doctrine Command
ATTN: ATMD
Fort Monroe, VA 23651-5000

1. Reference message HQ TRADOC, ATEN-FN, P071430Z Nov 84, subject: Request for Technical Assistance at Ft A. P. Hill.

2. Attached is the revised plan for ground-water monitoring around Building 225 at Fort A. P. Hill. The purpose of this ground-water consultation is to detect potential ground-water contamination from dioxin and priority pollutants in the area of Building 225.

3. All comments received on the draft plan have been reviewed and those found to be appropriate have been incorporated in the revised plan.

FOR THE COMMANDER:

Karl J. Daubel

Encl

KARL J. DAUBEL
Colonel, MS
Director, Environmental Quality

CF:
CDRUSACE (DAEN-ZCF-U)
CDRUSACE (DAEN-ZCE)
HQDA (DASG-PSP)
Cdr, TRADOC (ATEN)
Cdr, HSC (HSCL-P)
Comdt, AHS (HSHA-IPM)
Cdr, WRAMC (PVNTMED Svc)
Cdr, Ft Lee (ATZM-E)
Cdr, Ft A. P. Hill (ATZM-FHE-E)
Cdr, MEDDAC, Ft Belvoir
C, USAEHA-Rgn Div North
Guy and Davis Engineers
EPA Region III (Dr. Walter Lee)
Centers for Disease Control (Dr. Steven Margolis)

DOCUMENT 8

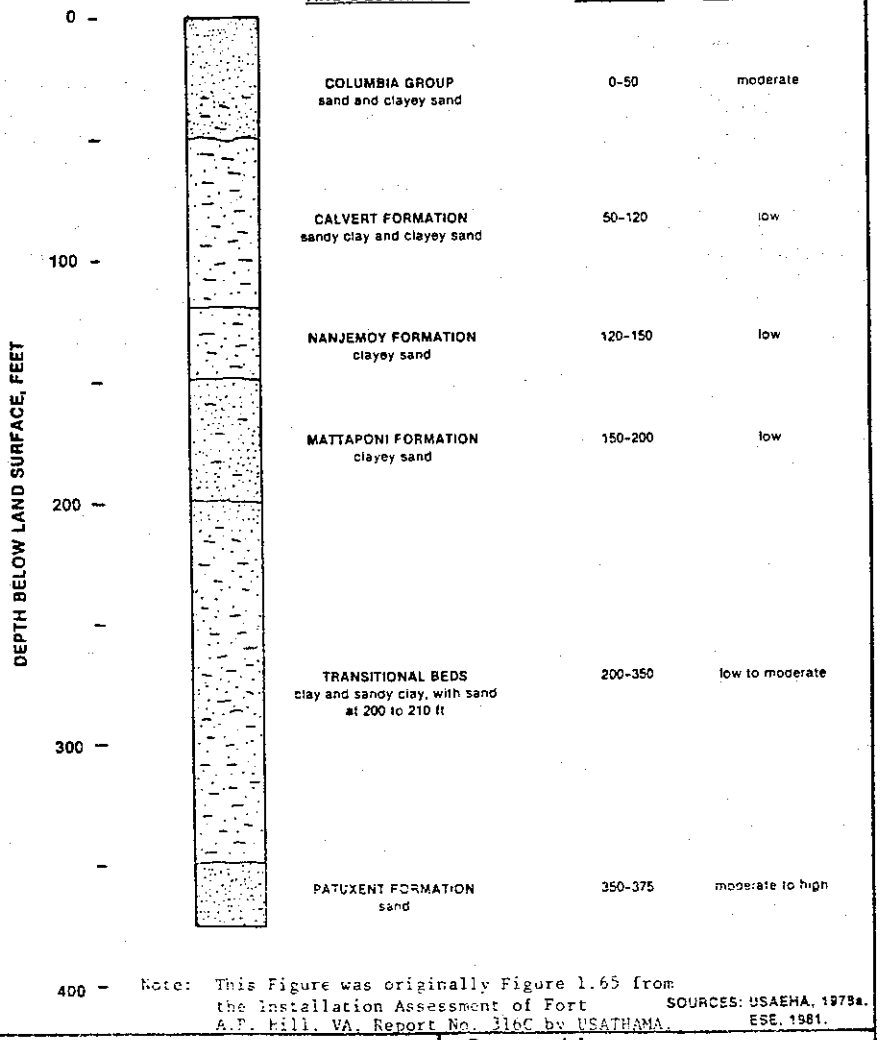
REVISED PLAN FOR GROUND-WATER MONITORING AROUND
BUILDING 225, FORT A.P. HILL, VIRGINIA

1. SUMMARY OF SUBSURFACE CONDITIONS.

a. Geology. Fort A. P. Hill is underlain by about 500 to 1000 feet (150 to 300 meters) of unconsolidated Coastal Plain sediments occurring in a wedge-shaped deposit, dipping and thickening to the east. These sediments overlie crystalline rocks of Precambrian age. The surficial material is assigned to the Columbia Group of Holocene and Pleistocene ages. The Columbia consists of up to about 50 feet (15 meters) of silty and clayey fine sands. The Calvert Formation of Lower Miocene age underlies the Columbia Group sediments and consists of about 70 feet (21 meters) of silty and sandy clays and clayey sands of marine origin. Underlying the Calvert is the Nanjemoy Formation of Upper Eocene age, also of marine origin, which consists of about 30 feet (9 meters) of glauconitic clayey sands. All three of these units crop out on the installation along some of the stream valleys, particularly those which drain towards the east. Other unconsolidated formations below the Nanjemoy have been identified at Fort A. P. Hill due to the drilling records of numerous potable water supply wells which were drilled into the Lower Cretaceous interbedded sands and clays of the Patuxent Formation.

b. Ground-water. Fort A. P. Hill relies on ground-water from over 20 wells as the source of potable water. The major source is the Patuxent Formation which is a deep confined aquifer. The surficial Columbia Group also contains an aquifer; however, this uppermost aquifer is unconfined, thin, and generally of limited economic importance. According to Figure 1 the relative permeability of the Columbia Group is moderate. The relative permeabilities of the Calvert, Nanjemoy, and Mattaponi Formations are low indicating that, although these underlying units are saturated, they are not regarded as aquifers. The local shallow water table configuration tends to follow the topography, occurring at slightly greater depths under the upland plains than in low-lying areas and stream valleys. A continuous water table should occur below the area of Building 225 at Fort A. P. Hill, probably ranging in depth from about 25 to 32 feet (7.5-9.6 meters). This water table depth occurs below the Old Guard site located about 2 miles (3 kilometers) to the southeast from the area of Building 225. Both these sites are at approximately the same elevation. This shallow ground water which should occur below the area of Building 225 probably drains away from the site in many directions, and most likely towards the intermittent

Use of trademarked names does not imply endorsement by the US Army, but is intended only to assist in identification of a specific product.



Note: This Figure was originally Figure 1.65 from the Installation Assessment of Fort A.P. Hill, VA, Report No. 316C by USATHAMA.

SOURCES: USAEHA, 1975a. ESE, 1981.

Figure 1
REPRESENTATIVE LOG OF GEOLOGIC FORMATIONS PENETRATED AT FORT A.P. HILL

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

tributaries and an unnamed pond (see Figure 2). Recharge of this shallow ground water is from precipitation.

c. Soil Characteristics. According to the Installation Assessment of Fort A. P. Hill, VA, Report No. 316c by the US Army Toxic and Hazardous Materials Agency, the particular soil series at the area of Building 225 is characterized as being well-to poorly-drained sandy clay loam. The permeability of this type of soil ranges from high to low depending on the clay content.

2. CONSTRUCTION OF MONITORING WELLS.

a. Locations and Rationale. Six monitoring wells are proposed to be constructed in a circle around Building 225 as shown on Figure 2. These wells are proposed to be located about 225 feet from the center of Building 225 and about equidistant from each other. The rationale for this arrangement will be that well 1 should be the upgradient well and wells 2,3,4,5, and 6 should be downgradient. The uniform distance from the center of Building 225 and the wells located equidistant from each other will be to accurately determine the direction of ground-water movement, and to collect representative water samples. These wells are located away from Building 225 to preclude the drilling of wells through an area of contamination. Ground-water table elevations from these wells will be carefully used to determine the ground-water flow direction, taking into account the potential for radial flow.

b. Method of Well Construction.

(1) These six wells will be constructed by this Agency employing an onboard US Army Captain as project officer and another individual who is an experienced driller. The wells will be drilled using a 6-inch hollow-stem auger with no drilling fluids being used. Well supplies, some essential equipment, and laborer support will be provided through the Facilities Engineering Office of Fort A. P. Hill. Each of the six boreholes will be drilled to a depth of about 40 feet or about 15 feet below the winter's water table. Each borehole will be logged in detail, using the unified soil classification system by the project officer. Split-spoon sampling will be done every five feet for the purpose of helping in the soil logging. Soil samples for both chemical and physical analysis will be collected if the project officer deems it appropriate.

(2) Monitoring wells shall be constructed in the boreholes with a 2-inch inside diameter (ID), schedule 40, solid polyvinyl chloride (PVC) pipe with flush-threaded, screw-type sections, each 10 feet in length. Care will be taken to assure that the screen and casing do not come in contact with the soil around the site and that they will be clean when they are installed.

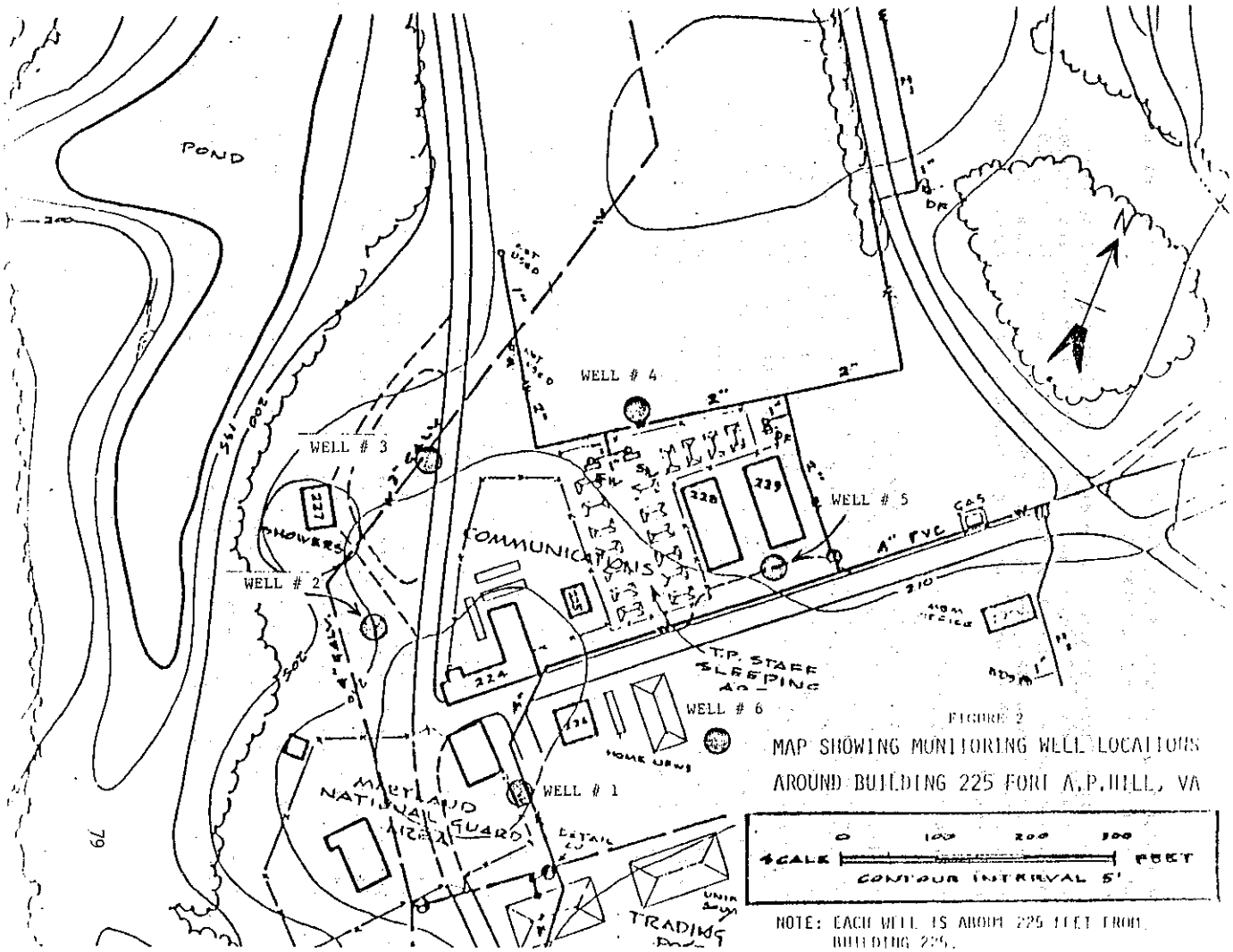


FIGURE 2

MAP SHOWING MONITORING WELL LOCATIONS AROUND BUILDING 225 FORT A.P.HILL, VA

NOTE: EACH WELL IS ABOUT 225 FEET FROM BUILDING 225.

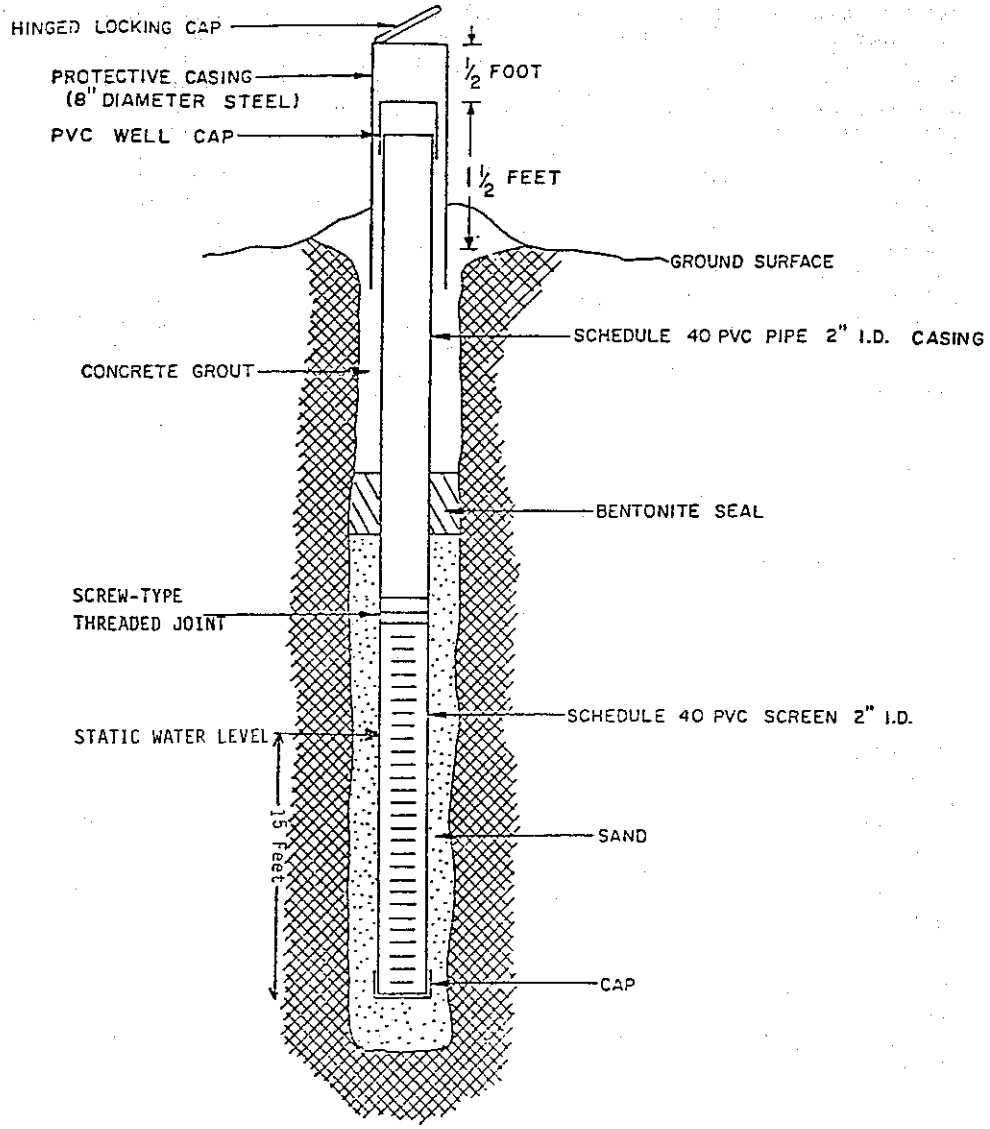


Figure 3. GENERALIZED MONITORING WELL CONSTRUCTION

The wells shall be plumb and straight the entire depth of the well. The well screen sections shall also be 10 feet in length with 0.01-inch factory-installed slots. This screen shall also be constructed of 2-inch ID, schedule 40 PVC with flush-threaded, screw-type sections. Two sections of well screen will be screwed together to make a total length of 20 feet in each well with a plug attached to the bottom end. About 15 feet of this screen will be placed below the winter's water table so that an additional 5 feet will be available to intercept the normal rise in the water table during the spring. The placement of a sand pack, bentonite seal, and cement grout shall be accomplished as shown in Figure 3. The sand pack shall consist of medium-to-coarse-grained sand larger in grain size diameter than the slots in the screen, and shall be placed in the annulus (between the well screen and the side of the borehole) to a minimum height of 3 feet above the screen. Samples of the sand will be kept for each well so that it can be determined at a later date whether the sand contributed to any contamination in the wells. A 2-foot thick (minimum) bentonite seal, using ½-inch diameter bentonite pellets, shall be placed above the sand pack. Pre-mixed concrete shall be poured into the annulus above the bentonite seal, and then the protective 6 or 8-inch diameter steel casing with lockable caps shall be placed around the above-ground 2-inch PVC pipe stick-up during the cementing operation. The base of the protective steel casing should be placed at least 1 foot below the surface, and the cementing should continue to insure that the cement is around both the PVC solid pipe and outside the protective casing at a level slightly higher than the ground surface to promote drainage of surface runoff away from the well. The protective steel casing with the lockable cap shall be installed to a height about 6 inches above the top of the PVC pipe which will also be above the ground surface. A ¼-inch "weep hole" or drain hole shall be drilled through the protective steel casing, immediately above the level of cement inside this casing to allow any water which may collect there to drain.

(3) All wells shall be developed by bailing (until the water clears) under the direction of the project officer. Bailing will be accomplished by use of a Teflon® bailer dedicated to each of the six monitoring wells to assure that no cross-contamination occurs between the wells. Due to the problem of possible ground-water contamination from pesticides and/or herbicides, the water from the bailer will not be poured on the ground during the well development, but placed into a 55-gallon drum until the well samples have been analyzed to assure that no pesticides/herbicides are present in the ground water.

(4) As soon as practical, after the completion and sampling of these monitoring wells, Fort A. P. Hill will provide a site survey to accurately locate each well in relation to surrounding permanent structures and to determine the elevation of the ground surface at each well casing to the nearest onne-hundredth of a foot.

®Teflon® is a registered trademark of E. I. DuPont de Nemours and Company, Inc., Wilmington, Delaware.

3. SAMPLING AND ANALYSIS OF THE GROUND WATER.

a. Measuring Water Levels. After development of all the wells, sufficient time should have elapsed to allow the water in the first well which was developed to rise to its static level. The distance (in feet) from the top of the well casing to the top of the water will be measured and recorded. The distance from the top of the well casing to the ground surface (stickup) will also be measured and recorded. The distance from the top of the well casing to the bottom of the well will also be measured and recorded.

b. Purging the Wells. In order to attain samples representative of the aquifer, five volumes will be removed from each well prior to collecting water samples. One well volume is calculated using the following formula:

$D^2 \times L$ (in inches) $\times$ 0.0034 = gallons

where: D = diameter of well in inches.
L = depth of water in the well in inches.

Purging will be accomplished using the dedicated Teflon® bailer in order not to have cross-contamination between wells. Again, as during the well-developing process, the water from the bailer will not be poured onto the ground during purging but will be placed into a 55-gallon drum until the well samples have been analyzed to assure that no pesticides/herbicides are present in the ground water.

c. Sampling the Wells. If a well recharges fast enough to bail continuously, samples will be collected immediately after five well volumes have been removed and placed in "temporary storage" in the 55-gallon drum. If a well is bailed dry, that well will be allowed to recharge while other wells are purged and sampled. A well which is pumped or bailed dry will be sampled as soon as it recharges sufficiently. The following containers will be filled at each well site:

Parameter	Containers Required
1) Purgeable Organics	18 (3 per sample) 40-milliliter glass vials (plus field blanks)
2) Base/Neutral Extractable Organics	6 each 1-liter, clean, narrow-neck glass bottles with Teflon®-lined caps (plus field blanks)
3) Acid Extractable Organics	6 each 1-liter, clean, narrow-neck glass bottles with Teflon®-lined caps
4) Pesticides/Herbicides/ PCBs	6 each 1-liter, clean, narrow-neck glass bottles with Teflon®-lined caps

Parameter	Containers Required
5) Phenol	6 each 1-liter, clean, narrow-neck glass bottles with Teflon®-lined caps
6) 2,3,7,8-TCDD(Dioxin)	12 each (2 per sample) 1-gallon amber or brown bottles
7) Metals	6 each 1-quart plastic cubitainer
8) Cyanide	6 each 1-quart plastic cubitainer
9) Mercury	6 each 60-milliliter plastic bottles

(Note: The purgeable organic compounds can volatilize due to aeration and agitation of the water; therefore, the dedicated bailer will be lowered carefully into the purged well until it touches the top of the water. The bailer will then be lowered another 25 or 30 inches without letting the top of the bailer go below the water surface. The water will be poured slowly and carefully from the top of the bailer into the glass vials. The vials will be filled to the top with no trapped air.)

d. Preparing the Samples. The preservatives required for each parameter are as follows:

Parameter	Preservatives
1) Purgeable Organics	Sodium thiosulfate (already placed in vials), cool, 4°C, holding time is 7 days until extraction
2) Base/Neutral Extractable Organics	None, cool, 4°C, holding time is 7 days until extraction
3) Acid Extractable Organics	None, cool, 4°C, holding time is 7 days until extraction
4) Pesticides/Herbicides/ PCBs	None, cool, 4°C, holding time is 7 days until extraction
5) Phenols	Filter sample through an 0.45-micron filter. Add one ampule of sulfuric acid to pH 2. Cool, 4°C, holding time is 28 days
6) 2,3,7,8-TCDD(Dioxin)	None, cool 4°C, holding time is 7 days until extraction
7) Metals	Filter sample through an 0.45-micron filter. Add one ampule of nitric acid to pH 2, holding time is 6 months

8)	Cyanide	Add 2 pellets of sodium hydroxide to pH 12, cool, 4°C, holding time is 14 days
9)	Mercury	Filter sample through an 0.45-micron filter. Add ampule of nitric acid and potassium dichromate to pH 2, holding time is 28 days.

(Note: The water samples to be filtered (phenols, metals, and mercury) can be collected at the well in a 1-gallon container. The filter equipment used will be a nitrogen-gas pressure Millipore® filtration system using 0.45 micron membrane filters. The 0.45 micron membrane filters used in the preparation of the samples will be pre-washed prior to use. Prefilters can be used initially when the sample is exceptionally turbid; however, the sample in the gallon container could be allowed to settle and then poured into the filtration system.)

e. Analyzing the Samples.

(1) Most of the samples will be analyzed by this Agency using USEPA-approved methods. The presence of organic priority pollutants will be determined by gas chromatography/mass spectrometry (GC/MS) using EPA Methods 624 (purgeable organics) and 625 (acid extractables, base/neutral extractables, pesticides and PCBs). Phenols will be determined by spectrophotometric, MBTH with distillation using Method 420.3. Metals will be determined by atomic absorption direct aspiration (Methods 202.1 to 289.1). Cyanide will be determined by colorimetric, manual distillation using Method 335.2. Mercury will be determined by atomic absorption automated cold vapor technique using Method 245.2. The 2,3,7,8-TCDD (Dioxin) will be sent to a private laboratory, approved by the US Environmental Protection Agency.

(2) The Commonwealth of Virginia has granted reciprocal certification to this Agency's laboratory with regard to the analysis of drinking water in accordance with the Safe Drinking Water Act. Quality assurance will be performed using the procedures outlined in the Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures, Quality Assurance, EPA-570/9-82-002, USEPA, Office of Drinking Water, Washington, DC, October 1982. Quality assurance for the purgeable organic and base/neutral extractable organic analyses will be additionally controlled through the use of travel blanks. The travel blanks (vials filled with clean water from the laboratory) will be prepared by the USAEHA personnel preparing the sample containers. The travel blanks will be sent with the empty bottles, carried into the field when sampling, and at least one will be in every cooler containing sample-filled bottles. The blanks will be analyzed in the USAEHA laboratory at the same time the purgeable organic and base/neutral extractable organic analyses are performed.

®Millipore is a registered trademark of Millipore Corporation, Wiggans Avenue, Bedford, Massachusetts.

US ARMY GROUND-WATER MONITORING AND ASSESSMENT PROGRAM

CHAIN OF CUSTODY RECORD

CONTAINER LISTING

SAMPLING DATE	WELL ID	CONTAINER (PARAMETERS)

	SIGNATURE	DATE/TIME	ORGANIZATION
SAMPLE COLLECTOR			
SAMPLE PREPARER			
LABORATORY CUSTODIAN			

METHOD OF SHIPMENT:

COMMENTS:

FIGURE 5

US ARMY GROUND-WATER MONITORING AND ASSESSMENT PROGRAM

CHAIN OF CUSTODY RECORD

CONTAINER LISTING

SAMPLING DATE	WELL ID	CONTAINER (PARAMETERS)
21 Oct 81	RW6	pest/herb
	"	TOH
	"	Cond
	"	NO_3/NO_2, Phenol, TOC
	"	F, Cl, SO_4
	[redacted] RW4, RW3	TOH
	" "	pest/herb
	" "	Cond
	" "	NO_3/NO_2, Phenol, TOC
	" "	F, Cl, SO_4
	RW1, RW2 RW3, RW4, RW6	Hg

	SIGNATURE	DATE/TIME	ORGANIZATION
SAMPLE COLLECTOR	Charles Brown	21Oct81/0830 hrs	Big Bang AAP
SAMPLE PREPARER	Jerry Smith	210ct81/0930 hrs	"
LABORATORY CUSTODIAN			

METHOD OF SHIPMENT: UPS Blue Label

COMMENTS:

(3) Regulations require that sample chain of custody records be maintained. Figure 4 is the record form which will be used and Figure 5 is a sample of a completed form. Three copies (including original) of the form must be completed for each cooler. Either carbon paper or a copier machine may be used. One copy should be held while the original and one copy are enclosed with the cooler. The forms should be placed in a plastic protector to keep them from getting wet. When the laboratory custodian receives the samples, that individual will sign all copies of the form. The original will be returned to the project officer and the remaining copy will be held by the laboratory custodian.

(4) If any well samples demonstrate parameter concentrations which could be a problem, resampling for these particular problem parameters at the monitoring wells where they were found will be accomplished by personnel from this Agency. The analyses and other data will be interpreted by this Agency. In accordance with this Agency's policy, shortly after the drilling and sampling trip, a preliminary report will be compiled and sent to the Commander, US Army Training and Doctrine Command (ATTN: ATMD), and copies will be furnished to the other interested parties. A final report will be prepared following the receipt of all the analytical data.

f. Schedule of Well Emplacement and Ground-water Sampling. A visit to Fort A. P. Hill by USAEHA representatives for the purpose of constructing, developing, and sampling six ground-water monitoring wells is planned for the period 7-18 January 1985. This schedule will be in effect provided there are no significant changes to this plan and provided the installation has all the required well supplies and equipment on hand prior to 7 January 1985.

David C. Bayha

DAVID C. BAYHA
Hydrologist
Waste Disposal Engineering
Division

USAQMCENFL
10 Dec 84

ACTION PLAN: Dioxin Cleanup, Fort A.P. Hill

REFERENCES: Annex A

1. PURPOSE: Coordinate and execute all required actions to complete cleanup of dioxin contamination at Fort A.P. Hill by 1 April 1985.

2. OBJECTIVES:

a. Cleanup the contaminated site at Fort A.P. Hill to U.S. Army Compliance Agreement standards and Environmental Protection Agency (EPA).

b. Provide interim and temporary storage at Fort A.P. Hill for dioxin contaminated materials.

c. Provide appropriate information to general public.

d. Provide personnel protective guidelines for cleanup and storage of contaminated materials.

e. Provide guidelines for medical surveillance of personnel involved in the cleanup and storage.

3. ASSUMPTIONS:

a. HQ U.S. Army Training and Doctrine Command (TRADOC) will provide instructions for final disposition of dioxin contaminated material.

b. Medical examinations and surveillance for personnel potentially exposed to dioxin prior to implementation of this plan will be accomplished through separate actions.

4. EXECUTION:

a. CONCEPT:

(1) The Commander, U.S. Army Quartermaster Center and Fort Lee is the Army Executive Agent for cleanup and temporary storage of dioxin contaminated material at Fort A.P. Hill and controls all funding. In this role, he is responsible for overall planning, coordination with Army and other agencies, providing funds and other resources, executing actions to accomplish cleanup, informing the public, and reporting.

(2) All cleanup and storage operations will be conducted by EPA under the terms of the Interagency Agreement.

ACTION PLAN: Dioxin Cleanup, Fort A.P. Hill

(3) As the Army Executive Agent, the Commander USAQMCENFL primarily will use his staff and subordinate commands to plan and control operations. The Director, Engineering and Housing (DEH), U.S. Army Quartermaster Center and Fort Lee, has primary staff responsibility for planning, coordinating, monitoring and reporting on execution of this plan.

(4) The Commander, Fort A.P. Hill will be assigned tasks for execution in accordance with his capabilities.

(5) HQ TRADOC will provide additional guidance and assistance as required.

b. TASKS:

(1) The Environmental Protection Agency will conduct and complete cleanup operations by 28 February 1985.

(2) Commander, Fort A.P. Hill:

(a) Serve as the Army command element for on-site operations.

(b) Provide administrative, logistical and communications support for on-site operations. Requirements exceeding local capabilities will be submitted to the Commander, U.S. Army Quartermaster Center and Fort Lee, ATTN: ATZM-E.

(c) Construct concrete slab to specifications provided for interim storage of dioxin contaminated materials.

(d) Coordinate temporary storage facility requirements with Norfolk District Engineers.

(e) Conduct or support briefings for approved visiting officials and groups as required.

(f) Prepare environmental documentation for siting of temporary storage facility.

(3) Director Engineering and Housing, USAQMCENFL:

(a) Serve as the primary plans and operations staff section with responsibility for overall planning, coordinating, monitoring and reporting on this action.

(b) Serve as the program manager for funds provided for this cleanup action.

(c) Serve as the overall point of contact and action staff for obtaining guidance, assistance, decisions and support required from the Commander and staff, USAQMCENFL, higher headquarters or supporting Federal and State agencies.

(d) Establish a periodic report to keep the Commanders, USAQMCENFL and TRADOC, appraised of cleanup status.

(4) Public Affairs Officer (PAO), USAQMCENFL, will provide appropriate information to the general public and handle media inquiries.

(5) Director, Health Services (DHS), USAQMCENFL:

(a) Serve as the primary Army Health Services contact point and action staff for providing or obtaining assistance, advice, guidance, procedures and support from Commander, U.S. Army Medical Department Activity at Fort Lee, higher medical support levels and supporting Federal agencies.

(b) Provide guidelines for protection of personnel involved in the cleanup and storage of dioxin contaminated materials.

(c) Provide guidelines for medical surveillance of personnel involved in this cleanup operation and subsequent storage of dioxin contaminated materials.

(6) All USAQMCENFL Staff Sections will provide assistance and support as required.

c. COORDINATING INSTRUCTIONS:

DEH, USAQMCENFL, is responsible for all coordination and reports. Commander, Fort A.P. Hill and all staff sections are required to coordinate with and keep DEH informed on actions and status of all tasks in paragraph 4b.

5. SERVICE AND MATERIAL SUPPORT:

a. Funds. Commander, USAQMCENFL will provide funds for all required actions at Fort A.P. Hill, Fort Lee, TRADOC, EPA, EPA contractor, and Norfolk District Engineer. Currently, adequate funds are available for all known requirements.

b. Facilities. Interim and temporary storage facilities must be constructed at Fort A.P. Hill. Commander, Fort A.P. Hill will execute plans provided for construction.

c. Commander, Norfolk Engineer District will provide design and contracting support for storage facility construction at Fort A.P. Hill.

d. Technical Assistance. USAQMCENFL and TRADOC staffs will provide technical assistance and coordination as required.

e. Claims for injury arising from operations conducted under this plan will be processed in the usual manner by the Claims Section, Office of the Staff Judge Advocate (SJA), USAQMCENFL.

6. COMMAND AND CONTROL:

Commanding General, USAQMCENFL, is the Army Executive Agent. All taskings, reports and actions will be controlled by CG through his staff. DEH is the principal coordinating staff for this plan. DEH will prepare both the Interagency Agreement and Compliance Agreement with EPA for MG Stillion's signature.

STILLIONS
MG

OFFICIAL:
METER
DEH

Annexes:
A - References
B - Engineering Plan
C - Public Affairs Plan
D - Health Services Plan

Distribution:
DAS
CDR, Ft A.P. Hill
Command Staff
TRADOC DCSENGR
Norfolk District

USAQMCENFL

10 DEC 84

ANNEX A REFERENCES TO QMC ACTION PLAN DIOXIN CLEANUP, FORT A.P. HILL

31 Oct 84 - SSO Message from Fort Lee to TRADOC
Subject: Soil Contamination

7 Nov 84 - TRADOC Message to USAEHA
Subject: Request for Technical Assistance at Fort A.P. Hill

13 Nov 84 - DA Message to TRADOC
Subject: Expedited Cleanup at Fort A.P. Hill with suspense of 1 Apr 85
OSA commitment to BSA

20 Nov 84 - TRADOC Message to DA
Subject: Request for COE on-scene Coordinator at Ft A.P. Hill. Mr. Cox

23 Nov 84 - SSO Message from TRADOC to Ft Lee
Subject: Expedited Clean-up of Dioxin Contamination at Ft A. P. Hill
Tasking Ft Lee as "Executive Agent." C/S tasks DEH and staff

26 Nov 84 - USAEHA Message to Ft A.P. Hill
Subject: Notification of visit, soil sampling

28 Nov 84 - USAEHA Message to Ft A.P. Hill
Subject: Notification of visit, soil sampling

DEH
10 Dec 84

ANNEX B (Engineering) to QMC Action Plan: Dioxin Cleanup, Ft A.P. Hill

1. PURPOSE: To coordinate, prepare reports required and provide resources to complete cleanup and temporary storage of dioxin contamination at Fort A.P. Hill by 1 April 1985.

2. OBJECTIVES:

a. Provide support and funding as required by Interagency Support Agreement (Appendix 4).

b. Provide support and funding as required to Commander, Fort A.P. Hill.

c. Provide funding as required to Commander, Norfolk District Engineer.

d. Provide interim and temporary storage facilities at Fort A.P. Hill.

3. ASSUMPTIONS: None

4. EXECUTION:

a. Concept:

(1) Commander, Fort A.P. Hill in coordination with State agencies determines requirements for interim and temporary storage.

(2) Commander, Fort A.P. Hill constructs interim storage site.

(3) Norfolk District designs/constructs temporary storage site.

(4) EPA under terms of the Interagency Support Agreement will cleanup dioxin at Fort A.P. Hill.

b. Tasks:

(1) Director, Engineering and Housing will serve as the primary staff and submit a periodic report on significant actions.

(2) Chief, ERMD provide budget support/funds control as required.

(3) Chief, EP&S provide technical and environmental support as required.

(4) Chief, B&G provide equipment and personnel support as required.

5. SERVICE AND MATERIAL SUPPORT:

a. Funding will be through TRADOC from DA.

DEH
10 Dec 84

ANNEX B (Engineering) to QMC Action Plan: Dioxin Cleanup, Ft A.P. Hill

b. Command and Control:

DOD

DOD EPA Liaison	LTC Dean Nelson	(202)475-8799

OASA

OASA-IL	COL Mike Sisk	(202)695-7824
OASA-IL	Lewis D.Walker	(202)695-7824

HQ DA

Env Ofc	COL Thomas Magness, III	(202)694-3434
SAG-C (JAG)	Barry Breen	(202)697-5155
DASG-PSP (Surgeon)	COL Dalton	(202)697-2796
DASG-PSP	COL Herndon	(202)697-2796
Env Ofc	David G. Palmer	(202)694-3434
Public Affairs	Billy F. Hunt	(202)695-5732
Public Affairs	LTC Craig C. Macnab	(202)697-7589

TRADOC

Haz Waste	LTC Young	(804)931-3300
SJA	LTC Clark	(804)931-2060
Environment	Mr. Aikin	(804)931-2362
Resource Mgmt	Blanche Rollins	(804)931-3051
Env Spec (Budget)	Larry Barb	(804)931-2362

Fort Lee

Director	LTC Meter	(804)734-4015
MEDDAC	CPT Inscoe	(804)927-5756
Env Engr	Mr. Johnson	(804)734-4254
JAGC	CPT Grimstad	(804)734-3631
Dioxin Coord	CPT Waligora	(804)734-4016
PAO	MAJ Craig	(804)734-3110

DEH
10 Dec 84

Fort A.P. Hill

Cdr	COL Distefano	(804)633-8206
DEH	G.M. Tribble	(804)633-8222
Deputy DEH	David Hoel	(804)633-8222

EPA

HQ	Billie Perry	(202)475-8906
HQ	Barry Korb	(202)382-4654
Region III	Mary Letzkus	(215)597-6687
Region III	Stephen R. Wassersug	(215)597-8131
Fed Fac Coord Reg III	Fran Mulhern	(215)597-1166
Region III	Bruce Smith	(215)597-8175
Region III	Phillip Retallick	(215)597-6624
Dioxin Tech Coord, Region III	Walter F. Lee	(215)597-6623

Centers for Disease Control

Jeffrey Lybarger, MD	(404)452-4161
Bucky Walters	(215)597-7291
Eric J. Sampson, PhD	(404)452-4151
Lee Tate	(404)452-4161
Frank Piecuch	(215)596-6650

Boy Scouts of America

BSA, Dallas, TX	Raul Chavez	(214)659-2261
Guy & Davis Cons Eng (Represent BSA)	K. V. Davis	(804)741-2364
	L. L. Guy, Jr.	(703)978-1083

VA Department of Health

W. Gulevich	(804)225-2975
Terri Cross	(804)225-2667

Norfolk District Corps of Engineers

MAJ Hawthorne	AV680-9601
Jerry Barnes	AV680-9709

DEH
10 Dec 84

US Army Environmental Hygiene Agency

Anal QA Ofc	Paul Sneeringer	(301)671-3269
Dir, Lab Svc	MAJ J. David Turnbull	(301)671-3639
Staff Officer	MAJ Forrest W. Oliveson	(301)671-2464
	LTC Charles E. Day, III	(301)671-3000
Dir, Env Quality	COL Karl J. Daubel	(301)671-2306
Ch, Waste Disposal Engr	MAJ Fred Boecher	(301)671-3651
Waste Disposal	Jack Heller	(301)671-3651
Pest Mgmt	Ken Olds	(301)671-3015
Hazardous Waste	David Guzewich	(301)671-3651

STILLIONS
MG

OFFICIAL:

METER
DEH

Appendixes:
1 - Sampling Plan
2 - Schedule of Significant Events
3 - Storage Requirements (Interim and Temporary)
4 - Interagency Support Agreement (IASA)
5 - Compliance Agreement

Appendix I Sampling Plan to Annex B to QMC Action Plan:

Dioxin Clean-Up Fort A. P. Hill

Appendix II Schedule of Significant Events to Annex B to QMC Action Plan:

Dioxin Clean Up Fort A. P. Hill

27 Nov 84 - EPA Contractor Started soil samples at Fort A. P. Hill.

29 Nov 84 - Press Conference. On-site at Fort A. P. Hill.

7 Dec 84 - Postwide sampling complete.

14 Dec 84 - Completion of Inter-Agency Agreement.

17-26 Dec 84 - TRADOC Chief of Staff Briefing at A. P. Hill.

21 Dec 84 - Complete Analysis of Soil Samples.
Completion of Compliance Agreement.

11 Jan 85 - Completion of Concrete Storage Slab

17 Jan 85 - Start Clean-up of Contaminated Soil at A. P. Hill.

27 Feb 85 - Completion of Storage Building.

28 Feb 85 - Completion of Clean-up at Fort A. P. Hill.

1 Apr 85 - OSA Commitment to BSA.

Appendix III Storage Requirements to Annex B to OMC

Action Plan: Dioxin Clean-Up Fort A. P. Hill

1. Storage Requirements submitted to Norfolk District Engineers (NDE) by Fort A. P. Hill.

2. Letter to NDE storage building timetables.

3. Interim storage slab to be constructed by Fort A. P. Hill.

Appendix IV Inter Agency support Agreement (IASA) Draft to Annex B to OMC Action Plan: Dioxin Clean-Up Fort A. P. Hill

Appendix V Compliance Agreement to Annex B to QMC Action Plan

Clean-Up Fort A. P. Hill

1. Draft is presently beng reviewed at DA.

2. HQ DA JAG and HQ TRADOC JAG will determine who will sign the final.

3. Estimated time for completion of agreement is 7 - 10 days (17 - 19 Dec).

Public Affairs Office
10 December 1984

ANNEX C (Public Affairs) to QMC ACTION PLAN: DIOXIN CLEAN-UP FORT A.P. HILL

1. PURPOSE: To provide Public Affairs support for the clean-up of dioxin contamination at Fort A.P. Hill.

2. OBJECTIVES:

a. Make maximum use of the national media (radio, TV, and newspapers) to pass essential information to families of scouts and military personnel. All releases and/or responses to media inquiries must be prompt, factual, and stress any recommendations made by the Centers for Disease Control (CDC).

b. Design Public Affairs coverage of specific events associated with the clean-up so that the media is provided maximum opportunity for photographs and interviews while minimizing their interference with clean up site operations.

c. Coordinate Public Affairs support between the Army, the Environmental Protection Agency (EPA), and the Boy Scouts of America (BSA) so that all agencies are "speaking with one voice."

d. Ensure Army, EPA, and BSA Public Affairs activities are coordinated with other interested agencies as appropriate.

3. ASSUMPTIONS:

a. Media attention will continue at a national level until extent of contamination is resolved and grounds cleaned.

b. That the media will continue to play Army, EPA, and BSA against each other in the search for information.

4. EXECUTION:

a. Concept: Public Affairs support will be required to deal with media interest associated with major events occurring during the clean-up operation. These major media events include but are not limited to:

(1) Site investigation and sample analysis conducted by both the EPA and independent Boy Scout contractor.

(2) Results of EPA/BSA sample analysis along with any revised health impact statement issued by CDC.

(3) Clean-up of contaminated soil by EPA contractor personnel and its removal to an approved storage site on or off of the installation.

(4) Results of the clean-up operation and certification that the site is no longer an environmental problem.

b. Tasks: The Fort Lee PAO will coordinate with the Public Affairs/ Relations Officers at DA, TRADOC, EPA, BSA, CDC and Fort A.P. Hill when appropriate. The following tasks are anticipated:

(1) Site investigation/sampling -- Fort Lee PAO to coordinate with all involved agencies to set up press conference on-site when EPA sampling operations begin.

(2) Results of sample analysis -- Fort Lee PAO to coordinate with EPA and BSA on results of their analysis and coordinate development of a joint release which addresses all findings.

(3) Site clean-up -- Fort Lee PAO to coordinate with all involved agencies to set up press conference on site when EPA clean-up operations begin.

(4) Results of clean-up operation -- it is anticipated that results of clean-up operations will be made jointly by DA, BSA, and EPA at an appropriate conference in Washington, DC. Information for this will be coordinated with SAPA-MRD, EPA, and BSA.

c. Coordinating Instructions. Fort Lee PAO will establish and maintain frequent contact with BSA, EPA, CDC, AEHA, SAPA-MRD, TRADOC PAO and essential Fort A.P. Hill personnel.

5. SERVICE AND MATERIEL SUPPORT: Existing Fort Lee and A.P. Hill PAO support should be sufficient to accomplish on-site requirements. Vehicles or other equipment to support the media are available at Fort A.P. Hill.

6. COMMAND AND CONTROL: The Fort Lee PAO will provide weekly updates and receive guidance directly from the Dioxin Project Army Executive Agent (CG, Fort Lee). Information regarding PAO support will be coordinated through both PAO and Engineer channels prior to implementation.

STILLIONS
MG

OFFICIAL:

CRAIG
PAO

DHS
10 December 1984

ANNEX D (Medical Considerations) to QMC Action Plan: Dioxin Clean-Up Fort A. P. Hill

REFERENCES:

a. 29 CFR - 1910.134 (clothing)

b. 29 CFR - 1910.133 (clothing)

c. ANSI Z 87.1 - 1968 (eye protection)

d. NIOSH Pub # 84-104 (respirators)

1. PURPOSE: To coordinate and execute all required actions for assessing health risks to exposed personnel.

2. OBJECTIVES:

a. Provide protective guidelines for personnel involved in the clean-up and storage of contaminated materials.

b. Provide guidelines for medical surveillance of personnel involved in the clean-up of contaminated material.

3. ASSUMPTIONS:

a. Assessment of health risks will be for those personnel involved in the clean-up of the site at Fort A. P. Hill, Virginia.

b. Environmental Protection Agency (EPA) clean-up contractor will provide adequate individual protection in accordance with contaimination level.

4. EXECUTION:

a. Concept.

(1) EPA will monitor the health aspects of the clean-up operation with the assistance of The Army Surgeon General, The Army Environmental Hygiene Agency and the Center for Disease Control (CDC), when required.

(2) EPA will direct and/or change level of protective measures used during the clean-up operation in accordance with the quantitative analysis results from the sampling obtained from Fort A. P. Hill.

b. Tasks.

(1) Director of Health Services, Fort Belvoir, VA will provide medical support required by the Fort A. P. Hill clean-up operation, as required.

(2) EPA will monitor the health aspects of the clean-up operation through its contractor. Appropriate individual protective measures of clean-

up personnel will be determined by the EPA based on standard procedures and the analysis of the sample results. (See Appendixes 1 and 2).

(3) The Army Environmental Hygiene Agency (AEHA) and the Center for Disease Control (CDC) will provide necessary guidance and information for clean-up operation, as needed.

(4) The Office of The Surgeon General will provide guidance on the health surveillance aspects for exposed personnel. (See Appendix 3).

(5) The Director of Health Services, Fort Lee, VA will serve as the Army Executive Agent's medical coordinator for the Dioxin clean-up operation at Fort A. P. Hill.

c. Coordinating Instructions. To ensure effective protective measures and health surveillance of personnel in support of the Dioxin clean-up the following points of contact are established.

(1) Office of The Surgeon General, Department of Army - COL Dalton, (AV) 227-2796.

(2) Army Environmental Hygiene Agency - LTC Jimmy Young (AV) 680-3300 (and/or Mr. Guzwich and/or Dr. Haller).

(3) Center for Disease Control - Lee Tate or Dr. Lybarger (FTS) 236-4161.

(4) Preventive Medicine Division, US Army Health Services Command, COL Swanson (AV) 471-2853/6612.

(5) Preventive Medicine Officer, Director of Health Services, Fort Belvoir,VA - LTC Wheeler (AV) 354-1044/5083.

(6) Preventive Medicine Officer, Director of Health Services, Fort Lee, VA. - Major Boger, (AV) 687-1033.

5. SERVICE AND MATERIEL SUPPORT: EPA and contractor provided materials and services should be sufficient for all health aspects of the operation. Director of Health Services, Fort Belvoir, Virginia is responsible for medical support to Fort A. P. Hill.

6. COMMAND AND CONTROL:

a. Commanding General, U. S. Army Quartermaster Center and Fort Lee, Fort Lee, Virginia is the Army Executive Agent.

b. Director Health Services, Fort Lee, Virginia is the medical coordinator for the Army Executive Agent.

c. Director Health Services, Fort Belvoir, Virginia is responsible for medical support to Fort A. P. Hill.

STILLIONS
MG

OFFICIAL:

LEVINE
COL

Appendixes: 1-EPA Contractor Responsibilities
2-Protective Clothing
3-Request for Guidance

Distribution: A

APPENDIX I (EPA Contractor Responsibilities) to ANNEX D (Medical Considerations) to QMC Action Plan: Dioxin Clean-Up Fort A. P. Hill

At no time shall an employee be exposed to Dioxin in the excess of the environmental limit.

Employees will be provided the use of safety showers and eye-wash fountains that are in proper working order and are regularly maintained.

Employees will be provided appropriate locker rooms for changing into protective clothing IAWF 29 CFR 1910.141(e) which separates street clothing and personal and protective clothing (PPE).

Employer will provide decontamination facilities for reusable clothing.

Employer will ensure there is proper facilities for decontaminating personnel who come into contact with Dioxin.

Employer will allow no eating, drinking, or consumption of food or beverage in work area.

The employer will provide a program of personal monitoring to measure the exposure of Dioxin in the breathing zone.

The employer shall keep pertinent medical records and environmental monitoring records.

The employer shall so instruct the workers they are working Dioxin and that it is a potential carcinogen and teratogen.

APPENDIX II (Protective Clothing) to ANNEX D (Medical Considerations) to QMC Action Plan: Dioxin Clean-Up Fort A. P. Hill

Control measures for potential occupational carcinogen.

Consideration should be given to disposable garments.

Both outer and inner protective garments should be worn. Outer garments will be coverall with hood, sleeves, gloves.

For particulates or dust, coveralls shall be of nonwoven fabric (spunbonded polyethylene).

For liquids, the coveralls, gloves, and boots should be made of chemically resistant materials.

Eye protection shall be IAW 29 CFR 1910.133/ANSI787.1-1968.

Inner garments should include cotton coveralls, undershirt, undershorts, gloves and socks which should be disposed of after use.

All clothing should be placed in marked containers. Reusable clothing and equipment should be thoroughly cleaned and checked for residual contamination before reuse or storage.

Respiratory protection shall be in IAW OSHA requirements and include proper fit testing and use, maintenance, inspection, and cleaning and evaluation of respirators.

APPENDIX III (Request for Guidance) to DMS Action Plan:Dioxin Clean-Up Fort A. P. Hill

DEPARTMENT OF THE ARMY
MEDICAL DEPARTMENT ACTIVITY
FORT LEE, VIRGINIA 23801-5260

REPLY TO
ATTENTION OF

HSXO-XO

7 December 1984

SUBJECT: Request for Guidance

THRU: Commander
USA Health Services Command
ATTN: HSCL-P (COL Swanson)
Fort Sam Houston, Texas 78234

TO: Department of the Army
Office of The Surgeon General
ATTN: DASG-PSP-O (COL Dalton)
Washington, DC 20310

1. This command has been requested to coordinate and develop a plan to insure effective individual protection and health surveillance of exposed personnel regarding the clean-up operations of Dioxin at Fort A. P. Hill, Virginia.

2. To facilitate such planning request your office provide guidance concerning the following and any other aspects you feel should be considered:

a. What protective measures should be used by clean-up personnel who would be exposed to the Dioxin?

b. What health monitoring/surveillance procedures should be implemented for exposed personnel?

c. What medical laboratory testing should be performed? How often and how long should surveillance be performed?

d. What symptoms might possibly be experienced by exposed personnel? How long before symptoms appear?

3. This letter confirms telecon between COL Dalton, COL Swanson, and LTC Bradford on 7 Dec 84.

FOR THE COMMANDER:

Jack E. Bradford

JACK E. BRADFORD
LTC (P), MSC
Deputy Commander for Administration

US ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

INTERAGENCY AGREEMENT/AMENDMENT
Part I — GENERAL INFORMATION

	1. IAG Identification Number: RW21931187-01-0	2. Funding Code: X1
	3. Type of Action: New Agreement	4. Program Abbreviation: OERR

5. Name and Address of EPA Organization
U.S. Environmental Protection Agency (EPA)
Office of Solid Waste & Emergency Response
401 M Street S.W.
Washington, D.C. 20460

6. Name and Address of Other Agency
Department of Defense
Commander, U.S. Army
Quartermaster Center (ATZM-E)
Fort Lee Virginia 23803

7. Project Title
Emergency Response at Fort A P Hill, Bowling Green, Virginia

8. EPA Project Officer *(Name, Address, Telephone Number)*
Billie Perry FTS/475-8906
Environmental Protection Agency (WH-548D)
Office of Emergency & Remedial Response
Washington, D.C. 20460

9. Other Agency Project Officer *(Name, Address, Telephone Number)*
Lt. Col. Gary Meter FTS/927-4015
Commander, U.S. Army
Quartermaster Center (ATZM-E)
Fort Lee, Virginia 23803

10. Project Period
11/8/84 thru 3/31/85

11. Budget Period
11/8/84 thru 3/31/85

12. Scope of Work *(Attach additional sheets, as needed)*

This agreement provides up to $1,000,000 to the Environmental Protection Agency (EPA) to cover obligations incurred in providing assistance to the Department of Defense, U. S. Army for emergency response activities associated with the Fort A P Hill dioxin incident.

EPA will:

1. Perform a dioxin site investigation at various locations at Fort A P Hill.
2. Provide analytical services through EPA's contract laboratory program.
3. Prepare appropriate planning documents for the site response.
4. Implement the response, as agreed upon by the EPA and the U.S. Army, using the ERCS contract.

CERCLA, E.O. 12316, Economy Act of 1932, as amended (31USC1535), and Defense Appropriations Act, P.L. 98-212, 30 Nov. 83.

13. Statutory Authority for both Transfer of Funds and Project Activities
See Above

14. Other Agency Type
Federal

FUNDS	PREVIOUS AMOUNT	AMOUNT THIS ACTION	AMENDED TOTAL
15. EPA Amount			
16. EPA In-Kind Amount			
17. Other Agency Amount		$1,000,000	
18. Other Agency In-Kind Amount			
19. Total Project Cost		$1,000,000	

20. Fiscal Information

Program Element	FY	Appropriation	Doc. Control No.	Account Number	Object Class	Obligation/Deobligation Amt
RLPY9C	85	68/20X8145	n/a	5RLP03RED4	n/a	550,000
				5RLP03RDD4		10,000
				5RLP723YD4		130,000
				5RLP723UD4		310,000

EPA Form 1610-1 (Rev. 8-84; Previous editions are obsolete

DOCUMENT 10

RECEIVED 31

PART II — APPROVED BUDGET	IAG IDENTIFICATION NO. R4721931187-01-0
21 Budget Categories	Total Itemization of Estimated Cost to Date
(a) Personnel	$
(b) Fringe Benefits	
(c) Travel	
(d) Equipment	
(e) Supplies	
(f) Procurement/Assistance	
(g) Construction	
(h) Other	
(i) Total Direct Charges	$ 1,000,000
(j) Indirect Costs: Rate ____ $ Base ____	
(k) Total (EPA Share 0 %) (Other Agency Share 100 %)	$ 1,000,000

22. Is equipment authorized to be furnished by EPA or acquired with EPA funds? ☐ Yes ☒ No
(Identify all equipment costing $1,000 or more)

23. Are any of these funds being used on extramural agreements? ☒ Yes ☐ No *(See Item 21)*
☐ Grant, ☐ Cooperative Agreement, or ☒ Procurement

Contactor/Recipient Name *(if known)*	Total Extramural Amount Under This Project	Percent Funded by EPA *(if known)*
Various	$990,000	0

PART III — PAYMENT METHODS AND BILLING INSTRUCTIONS

24. ☐ Disbursement Agreement

☐ Reimbursement — Request for reimbursement of actual costs will be itemized on SF 1081 or SF 1080 and submitted to the Financial Management Office, Environmental Protection Agency, 26 West St. Clair, Cincinnati, OH 45268:
☐ Monthly ☐ Quarterly ☐ Upon Completion of Work

☐ Advance — Only available for use by Federal agencies on working capital fund or with appropriate justification of need for this type of payment method. Unexpended funds at completion of work will be returned to EPA. Quarterly cost reports will be forwarded to the Financial Management Office, Environmental Protection Agency, 26 West St. Clair, Cincinati, OH 45268.

☐ Allocation Transfer — Used to transfer obligational authority or transfer of function between Federal agencies. Must receive prior approval by the Office of the Comptroller, Budget Division, Budget Formulation and Control Branch, EPA Headquarters.

25. ☒ Reimbursement Agreement

Other Agency's IAG Identification Number	Billing Instructions and Frequency
Billing Address Commander, U.S. Army Quartermaster Center (ATZM-E) Fort Lee, Virginia 23803 Attention: Lt. Col Gary Meter	Bill upon completion of project. DOD Appropriation: 9750810.0100

PART IV — ACCEPTANCE CONDITIONS

IAG IDENTIFICATION NO.
RW21931187-01-0

26. General Conditions:

The other agency covenants and agrees that it will expeditiously initiate and complete the project work for which funds have been awarded under this agreement.

27. Special Conditions:

1. This agreement will in no way modify or supersede any agreements presently in effect involving either party to this agreement.

2. EPA will maintain detailed and accurate records documenting personnel, travel, equipment, and all other costs for which reimbursement is requested under this agreement. This documentation must be available for audit or verification on request of the Inspector General.

3. EPA will request reimbursement via Form 1081. Included with the request for reimbursement will be a complete breakout by object class of all expenses incurred.

SEE ATTACHMENT A

Part V — OFFER AND ACCEPTANCE

NOTE: 1) For disbursement actions, the agreement/amendment must be signed in duplicate and one original returned to the Grants Administration Division for Headquarters agreements and to the appropriate EPA IAG administration office for Regional agreements within 3 calendar weeks after receipt or within any extension of time as may be granted by EPA. The agreement/amendment must be forwarded to the address cited in Item 28 after acceptance signature.

Receipt of a written refusal or failure to return the properly executed document within the prescribed time may result in the withdrawal of the offer by the Agency. Any change to the agreement by the other agency subsequent to the document being signed by the EPA Action Official which the Action Official determines to materially alter the agreement/amendment shall void the agreement/amendment.

2) For reimbursement actions, the other agency will initiate the action and forward two original agreements/amendments to the appropriate EPA program office for signature. The agreements/amendments will then be forwarded to the appropriate EPA TAG administration office for acceptance signature on behalf of the Environmental Protection Agency. One original copy will be returned to the other agency after acceptance.

EPA IAG Administration Office *(for administrative/management assistance)*	EPA Program Office *(for technical assistance)*
28. Organization/Address U.S. Environmental Protection Agency Grants Administrative Division (PM-216F) Grants Information & Analysis Branch Washington, D. C. 20460	29. Organization/Address U.S. Environmental Protection Agency (WH-548D) Office of Solid Waste & Emergency Response Office of Emergency & Remedial Response Washington, D. C. 20460

Decision Official on Behalf of the Environmental Protection Agency Program Office

30. Signature	Typed Name and Title	Date
for	Lee M. Thomas Assistant Administrator, Office of Solid Waste and Emergency Response	12-28-84

Action Official on Behalf of the Environmental Protection Agency

31. Signature	Typed Name and Title	Date
	EPA Action Official: Thomas L. Hadd, Chief GIAB/GAD	1-7-85

Authorizing Official on Behalf of the Other Agency

32. Signature	Typed Name and Title	Date
	GARY L. METER, LTC, CE Director, Engineering & Housing	1-9-85

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of Fort A. P. Hill Bowling Green, Virginia	)	
	)	FEDERAL FACILITY COMPLIANCE AGREEMENT
PROCEEDING UNDER EXECUTIVE ORDER 12088, 43 FR 42237	)	

The following findings are made and agreed to by the United States Environmental Protection Agency ("EPA") and the United States Army ("DA") under this Compliance Agreement issued pursuant to Executive Order 12088, October 13, 1978 (43 FR 47707), Executive Order 12316, January 14, 1981 (46 FR 42237) as amended, Executive Order 12418, May 5, 1983, (48 FR 20891), and the Memorandum of Understanding between the Department of Defense and the Environmental Protection Agency for the Implementation of P.L. 96-510, August 12, 1983. The Administrator has redelegated this authority to the Regional Administrator, EPA Region III. Notice of the issuance of this Agreement has been given to the Commonwealth of Virginia

DA, while not admitting the findings and determinations set forth herein, is willing to enter into this Compliance Agreement in order to enable the Remedial Investigation, Feasibility Study, and Remedial Actions at Fort A. P. Hill to be undertaken without delay.

FINDINGS OF FACT

1. DA is an Agency of the United States Government.

2. The site known as Fort A.P. Hill is located outside of Bowling Green, Virginia. The Commander, Training and Doctrine Command (TRADOC), Fort Monroe, Virginia, the major command responsible for Fort A.P. Hill, has been directed by the Acting Assistant Secretary of the Army for Installations and Logistics to take specific measures for addressing the dioxin contamination found at A.P. Hill. TRADOC has named Major General Stillions, Commanding General, USAQMCEN, Ft. Lee, Virginia to be the Executive Agent in this matter.

3. The Executive Agent has the authority and responsibility to enter into any necessary interagency agreements including funding and scheduling for DA.

4. Fort A.P. Hill ("the site") is a facility as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

5. Information furnished by DA to EPA indicates that DA stored pesticides which may have contained 2,3,7,8-tetrachlorodibenzo-p-dioxin ("TCDD") in a portion of the site known as Building 225. This storage occured prior to 1978.

6. Sampling conducted by DA indicates the presence of TCDD under Building 225 at a concentration of 228 ppb. Sampling outside of the fence downgradient of Building 225 at a distance of approximately 40 feet indicated the presence of TCDD at a concentration of 3 ppb.

7. TCDD is a hazardous substance as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

8. The presence of TCDD as mentioned in #6 above constitutes the release and the threat of release as defined in Section 101(2) of CERCLA, 42 U.S.C. § 9601(22).

9. DA and EPA have mutually agreed on a plan for monitoring sampling, testing, analyzing, and reporting which shall be referred to herein as the Sampling Plan. A copy of the Sampling Plan is attached hereto as Appendix A.

10. DA and EPA agree that a Feasibility Study is necessary to develop and analyze alternatives for remedial action and recommend a specific alternative to eliminate the release or threat of a release of a hazardous substance at Fort A.P. Hill. EPA and DA agree that the prompt execution of such a study is in the public interest.

DETERMINATION

11. Upon the basis of the foregoing, the Regional Administrator, EPA Region III, has determined that there may be an imminent and substantial endangerment to the public health or welfare or the environment due to the release and/or the threat of a release of a hazardous substance from the facility. The Regional Administrator believes that the actions agreed to below are necessary to protect the public welfare and the environment and are consistent with Section 300.68 of the National Oil and Hazardous Substance Contingency Plan, 40 C.F.R. § 300.68.

AGREEMENT

12. DA and EPA hereby agree that DA will carry out the Sampling Plan such that all sampling for TCDD called for in the Sampling Plan except in groundwater will be accomplished prior to December 31, 1984. DA will carry out the analyses called for in the Sampling Plan according to a schedule to be developed by DA and approved by EPA prior to December 31, 1984. Upon arrival, the analytical schedule will become part of the Sampling Plan. EPA and DA realize that the analytical schedule calls for performance by outside parties

and represents contracted deliverable dates. Failure upon the part of the contracted laboratory to promptly deliver the analytical data shall not be considered a breach of this Agreement.

13. DA agrees to submit a Feasibility Study which shall comply with the requirements of 40 C.F.R. § 300.68 (g)(h)(i) and (j) and the Draft Guidance for Preparation of Feasibility Studies by January 15, 1985. This study will provide the basis for selection of a Remedial Action by DA and EPA.

14. Upon approval of the selected Remedial Action by EPA, DA agrees to submit a design and begin implementation of the remedy by January 18, 1985.

15. DA agrees that all actions performed by DA as set forth in this Compliance Agreement shall be in conformance with all applicable laws and regulations.

Dated, entered, and effective as of 17 January 1985 with the agreement and consent of the parties.

DEPARTMENT OF THE ARMY

Eugene L. Stillions, Jr.

Eugene L. Stillions, Jr
Major General, USA
Commanding

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Thomas P. Eichler
Regional Administrator
Region III, EPA

Please read instructions on pages 4 and 5

ADVANCE Copy

US ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

INTERAGENCY AGREEMENT/AMENDMENT
Part I — GENERAL INFORMATION

1. IAG Identification Number	2. Funding Location by Region
RW21931187-01-1	XI
3. Type of Action	**4. Program Abbreviation**
Administrative Amendment	OERR

5. Name and Address of EPA Organization
U.S. Environmental Protection Agency (EPA)
Office of Emergency & Remedial Response
401 M Street, S.W.
Washington, D.C. 20460

6. Name and Address of Other Agency
Department of Defense
Commander, U. S. Army
Quartermaster Center (ATZM-E)
Fort Lee, Virginia 23803

7. Project Title
Emergency Response at Fort A. P. Hill, Bowling Green, Virginia

8. EPA Project Officer *(Name, Address, Telephone Number)*
Billie Perry FTS/475-8906
Environmental Protection Agency (WH-548D)
Office of Emergency & Remedial Response
Washington, D.C. 20460

9. Other Agency Project Officer *(Name, Address, Telephone Number)*
Lt. Col. Gary Meter
Commander, U.S. Army
Quartermaster Center (ATZM-E)
Fort Lee, Virginia 23803

10. Project Period
11/08/84 thru 05/31/85

11. Budget Period
11/08/84 thru 05/31/85

12. Scope of Work *(Attach additional sheets, as needed)*

This amendment provides an additional $500,000 to the Environmental Protection Agency to cover obligations incurred in providing assistance to the Department of Defense, U.S. Army for emergency response activities associated with the Fort A. P. Hill dioxin incident. Total funds for the project are increased from $1,000,000 to $1,500,000.

All other provisions remain unchanged.

CERCLA, E.O. 12316 & Economy Act of 1932, as amended (31USC1535), and Defense Appropriations Act, P.L. 98-212, 30 Nov. 83.

13. Statutory Authority for both Transfer of Funds and Project Activities
See above

14. Other Agency Type
Federal

FUNDS	PREVIOUS AMOUNT	AMOUNT THIS ACTION	AMENDED TOTAL
15. EPA Amount			
16. EPA In-Kind Amount			
17. Other Agency Amount	1,000,000	500,000	1,500,000
18. Other Agency In-Kind Amount			
19. Total Project Cost	1,000,000	500,000	1,500,000

20. Fiscal Information

Program Element	FY	Appropriation	Doc. Control No.	Account Number	Object Class	Obligation/Deobligation Amt
RLPY9C	85	68/20X8145	n/a	5RLP03RED4	n/a	400,000
				5RLP723YD4		100,000
DOCUMENT 11						

PART II — APPROVED BUDGET	IAG IDENTIFICATION NO RW21931187-01-1
21. Budget Categories	Total Itemization of Estimated Cost to Date
(a) Personnel	$
(b) Fringe Benefits	
(c) Travel	
(d) Equipment	
(e) Supplies	
(f) Procurement/Assistance	
(g) Construction	
(h) Other	
(i) Total Direct Charges	$ 1,500,000
(j) Indirect Costs: Rate % Base	
(k) Total (EPA Share 0 %) (Other Agency Share 100 %)	$ 1,500,000

22. Is equipment authorized to be furnished by EPA or acquired with EPA funds? ☐ Yes ☐ No
(Identify all equipment costing $1,000 or more)

23. Are any of these funds being used on extramural agreements? ☒ Yes ☐ No *(See item 21)*
☐ Grant, ☐ Cooperative Agreement, or ☒ Procurement

Contactor/Recipient Name *(if known)*	Total Extramural Amount Under This Project	Percent Funded by EPA *(if known)*
Various	$1,490,000	0

PART III — PAYMENT METHODS AND BILLING INSTRUCTIONS

24. ☐ Disbursement Agreement.

☐ Reimbursement — Request for reimbursement of actual costs will be itemized on SF 1081 or SF 1080 and submitted to the Financial Management Office, Environmental Protection Agency, 26 West St. Clair, Cincinnati, OH 45268
☐ Monthly ☐ Quarterly ☐ Upon Completion of Work

☐ Advance — Only available for use by Federal agencies on working capital fund or with appropriate justification of need for this type of payment method. Unexpended funds at completion of work will be returned to EPA. Quarterly cost reports will be forwarded to the Financial Management Office, Environmental Protection Agency, 26 West St. Clair, Cincinati, OH 45268.

☐ Allocation Transfer — Used to transfer obligational authority or transfer of function between Federal agencies. Must receive prior approval by the Office of the Comptroller, Budget Division, Budget Formulation and Control Branch, EPA Headquarters.

25. ☒ Reimbursement Agreement

Other Agency's IAG Identification Number	Billing Instructions and Frequency
Billing Address Commander, U.S. Army Quartermaster Center (ATZM-E) Fort Lee, Virginia 23803 Attn: Lt. Col. Gary Meter	Bill upon completion of project. DOD Appropriation: 9750810.0100

PART IV — ACCEPTANCE CONDITIONS	IAG IDENTIFICATION NO RW-21931187-01-1

26 General Conditions:

The other agency covenants and agrees that it will expeditiously initiate and complete the project work for which funds have been awarded under this agreement.

27. Special Conditions:

No change.

Part V — OFFER AND ACCEPTANCE

NOTE: 1) For disbursement actions, the agreement/amendment must be signed in duplicate and one original returned to the Grants Administration Division for Headquarters agreements and to the appropriate EPA IAG administration office for Regional agreements within 3 calendar weeks after receipt or within any extension of time as may be granted by EPA. The agreement/amendment must be forwarded to the address cited in Item 28 after acceptance signature.

Receipt of a written refusal or failure to return the properly executed document within the prescribed time may result in the withdrawal of the offer by the Agency. Any change to the agreement by the other agency subsequent to the document being signed by the EPA Action Official which the Action Official determines to materially alter the agreement/amendment shall void the agreement/amendment.

2) For reimbursement actions, the other agency will initiate the action and forward two original agreements/amendments to the appropriate EPA program office for signature. The agreements/amendments will then be forwarded to the appropriate EPA IAG administration office for acceptance signature on behalf of the Environmental Protection Agency. One original copy will be returned to the other agency after acceptance.

EPA IAG Administration Office *(for administrative/management assistance)*	EPA Program Office *(for technical assistance)*
28. Organization/Address U.S. Environmental Protection Agency Grants Administrative Division (PM-216F) Grants Information & Analysis Branch Washington, D.C. 20460	29. Organization/Address U.S. Environmental Protection Agency (WH-548D) Office of Solid Waste & Emergency Response Office of Emergency & Remedial Response Washington, D.C. 20460

Decision Official on Behalf of the Environmental Protection Agency Program Office

30. Signature	Typed Name and Title	Date
	Jack W. McGraw, Acting Assistant Administrator Office of Solid Waste & Emergency Response	

Action Official on Behalf of the Environmental Protection Agency

31. Signature	Typed Name and Title	Date
	Thomas L. Hadd, Chief Grants Information & Analysis Branch	

Authorizing Official on Behalf of the Other Agency

32. Signature	Typed Name and Title	Date
	Gary L. Meter, LTC, CE Director, Engineering & Housing	

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Feasibility Study

Dioxin Contamination at Fort A.P. Hill, Virginia

December 31, 1984

Prepared by:

Dennis M. Howard
Region 6 Technical Assistance Team

for:

Phillip Retallick
Region 3 Dioxin Program Manager

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I. Introduction

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4. In-site Treatment via Photolysis
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8. Excavate Contaminated Area, Store On-site Pending Final Disposal

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Appendix

A. Breakdown of Building 225 Demolition
B. Breakdown of Excavation Operations
C. Cleanup/Disposal Requirements under RCRA and CERCLA

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I. Introduction

A. Site History

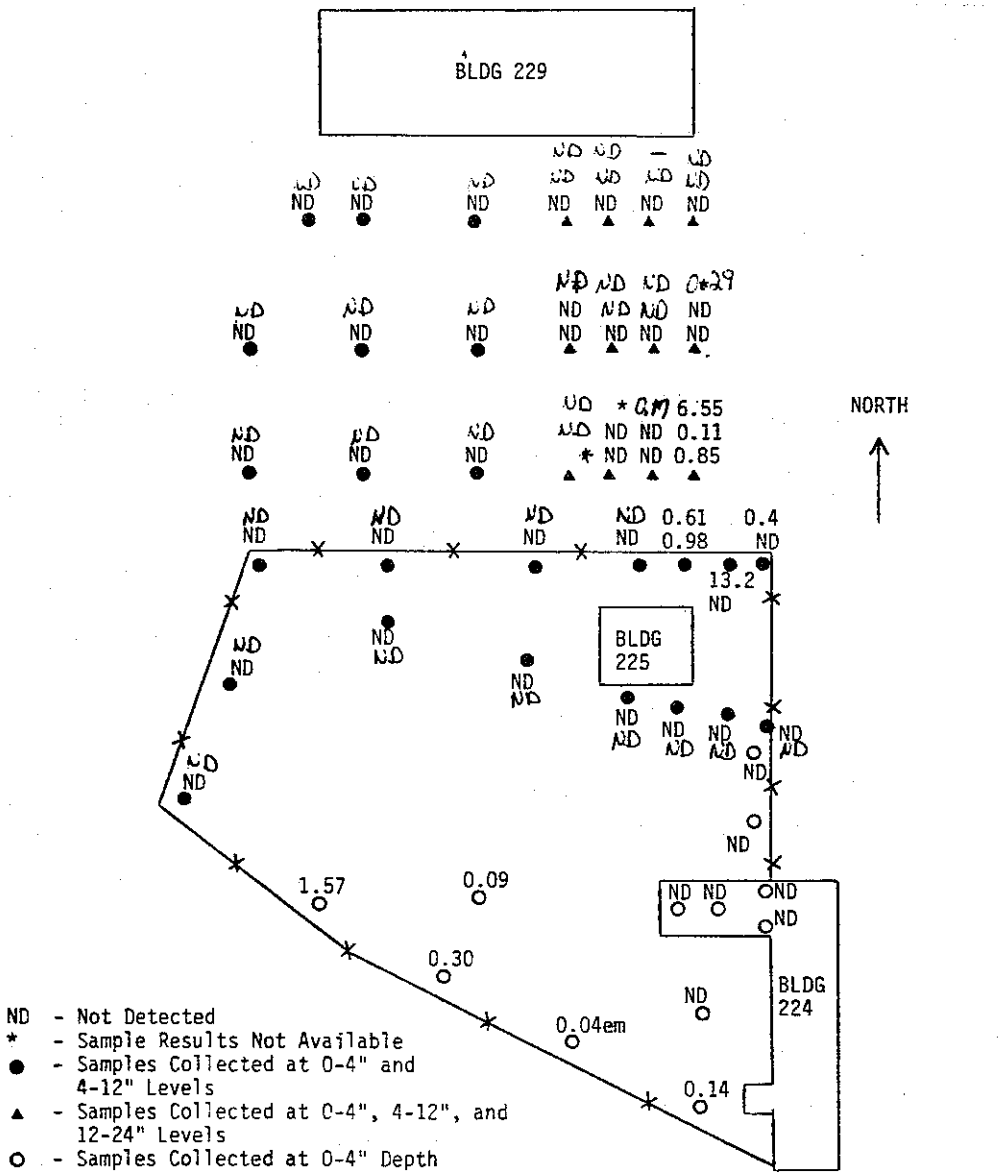
Fort A.P. Hill is a 76,000 acre military installation located in Caroline County, near Bowling Green, Virginia. The Fort is under the U.S. Army Training and Doctrine Command, and is used for infantry and artillery training excercises. Building 225 at the Fort was used between 1962 and 1978 for storage of the herbicides silvex, 2,4-D and 2,4,5-T. During a survey by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) in December, 1982, Building 225 was identified as a potential source of herbicide contamination. Soil sampling to detect herbicide contamination was conducted on March 12, 1984, by the U.S. Army Environmental Hygiene Agency (USAEHA). Sampling reports received in August 1984 indicated that the flooring and the soil under the shed were contaminated with the aforementioned herbicides, and that the drainage area around the shed was not highly contaminated with the herbicides.

Since dioxin is a known contaminant of the herbicides of interest, herbicide contamination suggested the probable existence of dioxin contamination. Two additionally composite soil samples, one under Building 225 and one outside the fenced area enclosing the building, were collected on July 19, 1984. The samples analyzed separately by two private laboratories, showed average dioxin levels of 217 parts per billion (ppb) 2,3,7,8-TCDD under the building, and 4.1 ppb 2,3,7,8-TCDD downgradient from the building. Based on these results, additional sampling was initiated November 26, 1984 and completed on December 6, 1984, in order to determine the vertical and horizontal extent of dioxin contamination. Results of this effort are summarized in the next section.

B. Sampling Results

Partial results of the November/December, 1984 sampling effort, conducted in the immediate vicinity of Building 225, are shown on Figures 1 and 2. Figure 1 shows contaminant levels within the fenced area at Building 225, and the area downgradient of 225. Additional outlying samples were collected around the area shown. These samples not shown on Figure 1, showed no detectable levels of contamination. Figure 2 shows contaminant levels under Building 225.

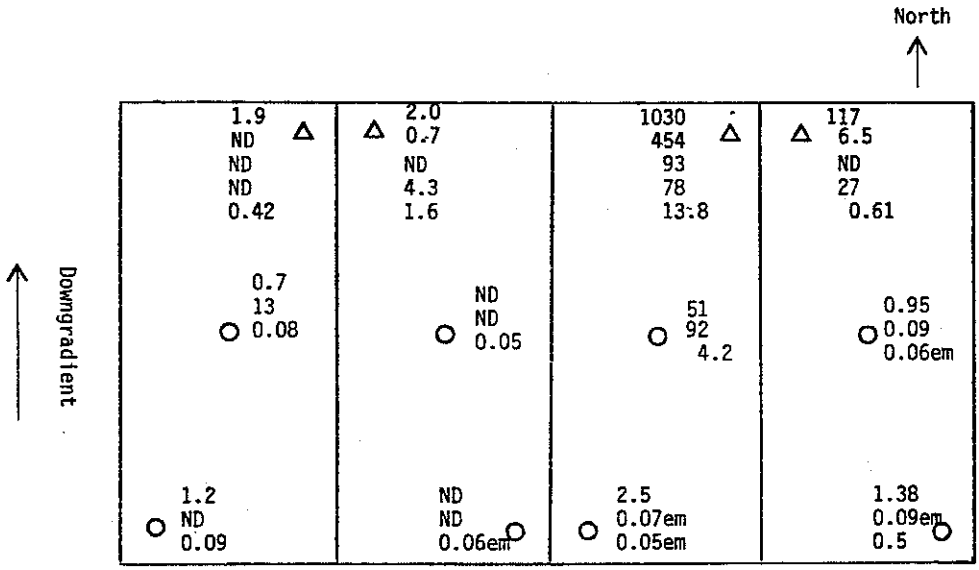
FIGURE 1 - CONTAMINANT LEVELS AROUND BUILDING 225



Approx. Scale 3/4" = 40 feet

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

FIGURE 2 - CONTAMINANT LEVELS UNDER BUILDING 225



ND - Not Detected
* - Sample Results Not Available
em - Estimated Maximum
△ - Samples Collected at 0-4", 4-12", 12-24", 24-36" and 36-48" Levels
○ - Samples Collected at 0-4", 4-12" and 12-24" Levels

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

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In addition to the locations shown, samples were collected from all of the drinking water wells on the Fort, and from all areas where Boy Scouts camped or had other activities during the 1981 Jamboree. Additionally, past areas of silvex and 2,4,5-T application were sampled. Samples were also collected of sediment from four lakes on the Fort. Tissue samples from fish obtained from each lake were collected. Results of all samples outline in this paragraph were unavailable as of the date of the report. Sample results received to date show no contamination at the Amphitheater assembly area, at two camping areas for which results have been received, and at the herbicide application areas.

II. Discussion

The purpose of this Feasibility Study is to examine alternative remedial actions which, when applied to the site, will serve to protect the public health, the environment, and the desired land use. Alternatives will be evaluated with regard to technical feasibility, public health and environmental impact, and cost. Based on the conclusions of this study, an alternative will be chosen and developed into a Remedial Action Plan for the site.

An acceptable Remedial Action Plan must consider the current and projected land use of the contaminated area. Specifically, the Boy Scout Jamboree scheduled for July, 1985, may be the deciding factor in what constitutes an acceptable Plan. Current plans call for housing 150 adult Scout leaders in tents in the area immediately downgradient of Building 225. It may be projected that the only remedial action which will not interfere with the Jamboree will be one which removes all contamination from public contact areas.

The Army has requested that a plan of action be followed which allows remedial activities to be concluded by March 1, 1985. This constraint limits the number of acceptable alternatives available. Alternatives which require the purchase of long lead time capital items, those which require drawn-out permitting procedures, or those which have not successfully been field-demonstrated in the past, will not be selected.

III. Remedial Alternatives Considered

A. Alternative List

1. No Action Alternative

This alternative involves taking no remedial action and leaving the existing site intact. It has the advantages of requiring essentially no expenditure of funds, and it meets the Army's requested schedule. Taking no action however ignores the basic problem of there being a notoriously toxic material, unconfined in the environment, presenting an exposure hazard to persons in the vicinity of the contaminated area. Taking no action would be unacceptable to the Army, to State and Federal environmental agencies, and to the Boy Scouts of America (considering the 1985 Jamboree).

Summary
- -are goals accomplished: No
- -is required schedule met: Yes
- -acceptable to all parties: No
- -cost: Essentially none

2. Cap Contaminated Area

This alternative involves leaving the contaminated area intact, and capping the area with an impermeable layer. Building 225 would be demolished and disposed of as contaminated material prior to placing the cap. The cap would consist of a 1 to 2 foot thick layer of compacted clay, covered by 6 inches of topsoil, sodded for erosion control. The existing fence around building 225 would be expanded to include the capped area. Based on the previously cited sampling results, an area of approximately 32,000 square feet would require capping. This includes all of the area within the fence currently enclosing Building 224 and 225, and 1650 ft^2 of land directly downslope of Building 225.

Surface capping would act to seal off the contaminated area from public contact, and it would prevent surface dispersal of contaminated material. It would not immobilize subsurface sediments, which might permit migration of dioxin contamination laterally. Surface capping is essentially an interim containment measure, and would likely be approved by the USEPA as such. Because capping leaves the contamination on-site, it would probably not be acceptable to the Army, considering present commitments for areas adjacent to

the contamination, and the upcoming Jamboree. Public perceptions concerning dioxin have in the past indicated that complete removal of the contamination from public use areas is the only acceptable alternative.

As an alternative to clay capping, asphalt paving has in the past been used to confine dioxin contamination. It has an advantage over clay capping of requiring a smaller volume of material, and requiring less maintenance. The smaller volume of material becomes an advantage when final site cleanup, and the associated excavation, are undertaken. Much of the capping material will be contaminated due to contact with the dioxin laden soils, and the smaller the quantity of material added initially, the less there will be to be disposed of eventually.

Summary
- -are goals accomplished: No
- -is required schedule met: Yes
- -acceptable to all parties: No
- -costs:
  - a) clay cap, assume 1 foot thick over 32,000 square feet
    1185 yd^3 x \$55/yd^3 \$65,175
    soil cover, assume 6 inches thick over 32,000 square feet
    593 yd^3 x \$10/yd^3 \$ 5,930
    seeding, lump sum \$ 2,000
    Total \$73,105
  - b) asphalt cap, assume 4" layer over 32,000 square feet
    32,000 ft^2 x \$0.80/ft^2 \$25,560
    gravel sub base, assume 6" layer over 32,000 square feet
    592 yd^3 x \$15/yd^3 = \$ 8,880
    Total \$34,440

3. Solidify and Entomb Contaminated Area

This alternative expands upon Alternative 2 by chemically solidifying the contaminated soils before applying the clay or asphalt cap. The solidification process acts to bind subsurface sediments to prevent migration and leaching of contaminated soils. The effectiveness of solidification depends upon the type of soils treated, and the depth of treatment. This alternative is subject to the same criticism as 2, as

the contamination is left on site, although in a confined manner.

Summary
- -are goals accomplished: No
- -is required schedule met: Yes
- -acceptable to all parties: No
- -cost:

assume solidification to 4' depth under building 225
$2475\ ft^2 \times 4\ ft = 366\ yd^3$
assume solidification to 1' depth in area downgradient of building 225
$1650\ ft^2 \times 1\ ft = 61\ yd^3$

a) Solidification		
$427\ yd^3 \times \$80/yd^3$		$ 34,160
Asphalt cap		$ 34,440
	Total	$ 68,600
b) Solidification		$ 34,160
Clay cap		$ 73,105
	Total	$107,265

4. In-Situ Treatment via Photolysis

This alternative utilizes photodegration as a means of decontaminating soils in place. This is achieved by applying a hydrogen donor material to the soil followed by sunlight or ultraviolet lamp radiation. The soil is then reworked and the process repeated as often as necessary to lower the contamination to the desired level.

This type of treatment technology is still in the developmental stage. It appears to be best suited to treating large areas (in excess of 10 acres) where the depth of contamination is known to be relatively shallow (less than 12 inches). The capital expense required to construct the radiation unit may be considerable, and could not be justified on the relatively small A.P. Hill site. A serious drawback to this treatment scheme is the unknown number of rework passes required to achieve the desired destruction. It has not been satisfactorily field tested in this country.

Summary
- -unacceptable due to experimental nature of treatment process
- -cost: not calculated, but assumed to be high

5. Excavate Contaminated Area, Transport to Commercial Disposal Site

This alternative requires that Building 225 be demolished, and that contaminated soils be excavated for subsequent off site disposal. This alternative effectively addresses environmental and human exposure concerns, and prepares the site for the desired future use. While site excavation and restoration is a straightforward application of known technology, disposal at a commercial disposal site may prove difficult, if not impossible. Twenty-two potential disposal sites were surveyed by USEPA during 1984; of these, two appeared to satisfy the applicable criteria. Both sites were later ruled out, which leaves no sites currently approved to receive dioxin contaminated wastes.

Summary
- -are goals accomplished: Yes
- -is required schedule met: Yes
- -acceptable to all parties: Probably
- -cost:

Confirmation Sampling	
100 samples x $500/sample	$ 50,000
Demolish Building 225, lump sum	$ 26,000
Excavation, lump sum	$ 23,000
Transport	
140 yd^3 x 1 truckload/20 yd^3 x $2.00/mile x 300 miles	$ 4,200
Landfill Disposal	
140 yd^3 x $300/$yd^3$	$ 42,000
Total	$145,200

- -feasible: No, due to lack of disposal site

6. Excavate Contaminated Area, Transport to Commercial Incinerator for Thermal Destruction

This alternative differs from Alternative 5 in the means of final disposal selected. Commercial incineration is often used to destruct many types of hazardous waste, although it is substantially more expensive than landfill disposal. The effectiveness of incineration at destroying dioxin bound in a soil matrix has yet to be demonstrated. The USEPA is preparing a series of test burns using a mobil incinerator to generate data on destruction efficiencies on dioxin bound in various substrates. These test burns will likely run until June, 1985. It is doubtful that the data will be analyzed and performance criteria for commercial

incinerators set before January 1, 1986. Therefore this alternative does not satisfy the schedule requested by the Army.

Summary
- -are goals accomplished: Yes
- -is required schedule met: No
- -acceptable to all parties: Probably
- -cost:

Confirmation Sampling	
100 samples x $5.00/sample	$ 50,000
Demolish building 225, lump sum	$ 26,000
Excavation, lump sum	$ 30,000
Transport	
920 drums x 1 truckload/80 drums x $2.00/mile x 300 miles	$ 6,900
Commercial Incineration	
920 drums x $200/drum	$184,000
Total	$296,900

- -feasible: No, due to current lack of available commercial incinerator

7. Excavate Contaminated Area, Store Material at Another Army Facility, Pending Final Disposal

This alternative requires that contaminated materials be temporarily stored off-site at another Army facility until a final disposal option is selected. The U.S. Army Environmental Hygiene Agency has checked out potential sites and has encountered the predictable attitude that no facility wants to become a depository for another's dioxin waste. Given the high probability that contaminated materials will remain on site, there is little incentive for the Army to create additional problems for itself by moving the wastes to another Army facility.

Summary
- -are goals accomplished: Yes
- -is required schedule met: Yes
- -acceptable to all parties: No
- -cost: not calculated
- -feasible: No, no alternative Army waste storage facility available

8. Excavate Contaminated Area, Store On-Site Pending Final Disposal

This alternative would utilize a specially constructed storage facility, located in a secured section

of Fort A.P. Hill, for the interim storage of contaminated materials. It has all of the previously stated advantages of physically removing the contamination from human contact areas, and avoids the problem associated with moving the contaminated materials offsite. Approval of this alternative is probably dependent upon the projected length of the interim storage period. Considering the efforts being made on the National level by USEPA Headquarters to confront the national dioxin problem, it appears likely that there will be permitted facilities for dioxin destruction/disposal available within the next few years. Considering this, it is estimated that a temporary storage facility would not be utilized for more than 2 to 3 years.

Summary

- -are goals accomplished: Yes
- -is required schedule met: Yes
- -acceptable to all parties: Probably
- -cost:

Confirmation Sampling	
100 samples x $500/sample	$ 50,000
Demolish building 225, lump sum	$ 26,000
Excavation, lump sum	$ 50,000
Total	$126,000

Cost of on-site storage facility not included.

Cost of ultimate disposal not included.

- -feasible: Yes

B. Alternative Summary

Alternative	Goals Accomplished	Acceptability	Schedule Met	Cost	Feasibility	RCRA[1] Compliance	CERCLA[1] Compliance
1. No Action	No	Low	Yes	Low	Low	-	No
2. Cap Contaminated Area -clay -asphalt	No	Low	Yes	 $ 73,000 $ 34,000	Moderate	-	No
3. Solidify and Entomb -clay -asphalt	No	Low	Yes	 $107,000 $ 69,000	Moderate	-	Yes
4. Treatment via Photolysis	No	Low	No	-	Low	-	No
5. Excavate, Commercial Disposal	Yes	High	Yes	$145,000	Low	Yes	Yes
6. Excavate, Commercial Incineration	Yes	High	Yes	$300,000	Low	Yes	Yes
7. Excavate, Off-Site Army Storage	Yes	Moderate	Yes	-	Moderate	Yes	Yes
8. Excavate, On-Site Interim Storage	Yes	High	Yes	$126,000	High	Yes	Yes

(1) See Appendix C for requirements under RCRA and CERCLA

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IV. Conclusion

Examining the Alternative Summary, it appears that only alternatives which physically remove contamination from the site adequately accomplish the required goals and therefore bear further consideration. Of these, those alternatives which require moving contamination off-site (Alternatives 5, 6 and 7) show only low to moderate feasibility, due to the problems associated with finding someone who will accept dioxin contaminated materials. Only Alternative 8, requiring excavation of contaminated soil and on-site interim storage, accomplishes the required goals and provides a highly feasible means to remove the contamination from the environment and from public contact. Alternative 8 does provide only an interim solution to the disposal problem, but for previously mentioned reasons, it is hoped that final disposal can be accomplished in 2 to 3 years.

Alternative 8 appears to be the alternative best suited for development into a Remedial Action Plan for the site.

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APPENDIX

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Appendix A - Breakdown of Building 225 Demolition

1. Dismantle Roof Steel and Timbers
   -assume (2) 10 hour days
   -crew and equipment

4 cleanup technicians, $30/hr. x 80 hrs.	$2,400
1 supervisor, $60/hr. x 20 hrs.	$1,200
1 Health and Safety officer, $45/hr. x 20 hrs.	$ 900
1 Cherry Picker with operator, $300/day x 2 days	$ 900
4 chain saws, $200 ea.	$ 800
1 cutting torch, $300	$ 300
TOTAL	$6,200

2. Dismantle Walls and Floor
   -assume (3) 10 hour days
   -Crew and Equipment

4 cleanup technicians, $30/hr. x 120 hrs.	$3,600
1 supervisor, $60/hr. x 30 hrs.	$1,800
1 Health and Safety officer, $45/hr. x 30 hrs.	$1,350
1 bulldozer with operator, $500/day x 3 days	$1,500
TOTAL	$8,250

3. Break-up Foundation and Concrete Block Walls
   -assume (2) 10 hour days
   -Crew and Equipment

4 cleanup technicians, $30/hr. x 80 hrs.	$2,400
1 supervisor, $60/hr. x 20 hrs.	$1,200
1 Health and Safety officer, $45/hr. x 20 hrs.	$ 900
1 backhoe with jackhammer attachment, $300/day x 2 day	$ 600
1 air compressor, $200/day x 2 days	$ 400
TOTAL	$5,500

4. Volumes of Waste Material Generated
   -assume 35 gallon drums used for containment
   -assume 60% of drum volume is filled
   a) building roof and rafters, 35 drums
   b) building walls and floor, 90 drums
   c) building foundation, 50 drums
   TOTAL 175 drums

   -Drum Costs

fiberpacks: 175 drums x $8/drum	$1,400
55 gallon steel: 175 drums x $25/drum	$4,375
TOTAL	$5,775

5. Cost Summary

-Dismantle Roof	$ 6,200
-Dismantle Walls and Floor	$ 8,250
-Break-up Foundation	$ 5,500
-Drums	$ 5,775
TOTAL	$25,725

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Appendix B - Breakdown of Excavation Operations

1. Area Along South Fence Line
   -assume contaminated area is 200 ft. long by 5 ft. wide
   -assume contamination is 6 inches deep
   -assume excavation is done in two 3" passes
   -estimate excavation can be accomplished in (2) 10 hour days
   -volume of soil generated: 500 ft^3
   -Crew and Equipment

1 gradall with operator, $600/day x 2 days	$1,200
4 cleanup technicians, $30/hr. x 80 hrs.	$2,400
1 supervisor, $60/hr. x 20 hrs.	$1,200
1 Health and Safety officer, $45/hr. x 20 hrs.	$ 900
TOTAL	$5,700

2. Area Under Building 225
   -assume contaminated area is 35 ft. long x 25 ft. wide
   -assume contamination averages 2 ft. depth
   -assume 1 ft. is initially excavated, and the area sampled. If positive, excavate additional 3" layers until sample results are negative
   -estimate excavation can be done in (4) 10 hour days
   -volume of soil generated: 1750 ft^3
   -Crew and Equipment

1 gradall with operator, $600/day x 4 days	$ 2,400
4 cleanup technicians, $30/hr. x 160 hrs.	$ 4,800
1 supervisor, $60/hr. x 40 hrs.	$ 2,400
1 Health and Safety officer, $45/hr. x 40 hrs.	$ 1,800
TOTAL	$11,400

3. Area Downgradient of Building 225
   -assume contaminated area is 55 ft. long by 30 ft. wide
   -assume contamination is 6 inches deep
   -assume excavation is done in two 3" passes
   -estimate excavation can be done in (2) 10 hour days
   -volume of soil generated: 825 ft^3
   -Crew and Equipment

1 gradall with operator, $600/day x 2 days	$1,200
4 cleanup technicians, $30/hr. x 80 hrs.	$2,400
1 supervisor, $60/hr. x 20 hrs.	$1,200
1 Health and Safety officer, $45/hr. x 20 hrs.	$ 900
TOTAL	$5,700

4. Volumes of Waste Material Generated
   -assume 35 gallon drums used for containment
   -drum capacity: 4.68 ft^3 x 80% fluff factor = 3.34 ft^3
   a) south fence line
      500 ft^3 x 1 drum/3.34 ft^3 = 150 drums
   b) area under bldg. 225
      1750 ft^3 x 1 drum/3.34 ft^3 = 524 drums
   c) area downgradient of bldg. 225
      825 ft^3 x 1 drum/3.3 ft^3 = 247 drums
      TOTAL 921 drums

-Drum Costs

fiberpacks: 921 drums x $8/drum	$ 7,368
55 gallon steel: 921 drums x $20/drum	$18,420
TOTAL	$25,788

5. Cost Summary

-excavate south fence line	$ 5,700
-excavate under building 225	$11,400
-exvavate downgradient of building 225	$ 5,700
-drums	$25,800
TOTAL	$48,600

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Appendix C - Cleanup/Disposal Requirements under RCRA and CERCLA

1. RCRA - The Resource Conservation and Recovery Act of 1976 (RCRA) sets standards for hazardous waste storage and disposal facilities. Dioxin bearing wastes are not currently regulated under this Act, although the herbicides contaminating the subject site are regulated. The remedial alternatives considered herein are subject to the following requirements.

   Commercial Landfill Disposal

   -requires an impermeable liner and a leachate collection and removal system (Ref CFR 40, subsection 264.301)
   -landfill site must have a ground water protection program (Ref CFR 40, subsection 264.91)
   -site must have a closure and post-closure plan (Ref CFR 40, subsection 264.111)

   Incineration

   -must achieve a destruction and removal efficiency fo 99.99% for each principal organic hazardous constituent (Ref. CFR 40, subsection 264.343)
   -the incinerator may burn only wastes specified in it's operating permit, and only under the specified operating conditions. Alternatively, permitted wastes may be revised after conducting approved trial burns (Ref CFR 40, subsection 264.344)

   Interim Storage

   Fort A.P. Hill is currently authorized under interim status as described in 40 CFR subsection 265 to store drums of solvent on site. In order to store drums of herbicide contaminated materials on site, the current permit application would require modification stating the intended additions and would be resubmitted to the State of Virginia, which has permitting authority. Waste containers and the storage facility would be required to meet the requirements of 40 CFR subsection 265.170.

2. CERCLA - The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) sets standards for cleanups at hazardous waste sites. As a general rule, response actions are required which prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health, welfare, or the environment. Options listed in the Alternative Summary were objectively evaluated in light of this requirement, and the determination on CERCLA Compliance made.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

January 15, 1985

Mr. Ralph Jordan
Boy Scouts of America
1325 Walnut Hill Lane
Irving, Texas 75038-3096

Dear Mr. Jordan:

We, at the Centers for Disease Control (CDC), have evaluated the analytical results of soil samples collected by the U.S. Environmental Protection Agency (EPA) from Ft. A. P. Hill, Virginia. The EPA has provided the results of all soil samples: under building 225, inside the fenced area surrounding building 225, the downgradient area north of building 225, in areas sprayed with dioxin-contaminated herbicides on Ft. A. P. Hill, and in the scout activity areas (amphitheatre, 1981 camping areas, planned 1985 camping areas). All well water sample results were also provided. Results of surface wipe samples from within buildings 224, 225, and 226, and tissue sample results from fish collected from Fishhook Lake were not provided; results from these tests are not expected for several weeks.

We believe that several conclusions can be reached from the review of this information. First, all analytic batches contained appropriate performance audit samples which were within established control limits for the purpose of quality assurance. TCDD in soil under building 225 ranged up to 1030 parts per billion (ppb). Soils in the immediate downgradient area north of building 225, but still within the fenced area, contained TCDD; the highest level in this area was 13.2 ppb. Along the fenceline south of building 225, soil samples had a maximun level of 1.57 ppb. Outside the fence, continuing along the northward downgradient from building 225, one sample contained 6.55 ppb and four other sampling locations contained TCDD at less than 1 ppb at varying soil depths. No herbicide sprayed area samples contained any TCDD and no well water samples contained TCDD. Samples collected and analyzed for the Boy Scouts of America yielded comparable results.

The EPA has provided a feasibility plan which presents eight alternatives for consideration as remedial action cleanup plans for the areas discovered to have TCDD contamination under and around building 225. We believe that the goal of the remedial project is to contain discovered hazardous materials, so as to not create a public health hazard. All of the remedial options provided by EPA would contain the discovered Ft. A. P. Hill TCDD contaminated soils. We believe that the EPA's recommended plan is the excavation of contaminated soil and storage in a secure area miles away from the Boy Scout Jamboree area.

Minimizing or eliminating the potential for human exposure to TCDD contaminated material is the major public health concern for scouts and guests attending the 1985 Jamboree. The successful completion of the EPA remedial plan would remove all of the TCDD contaminated soil and eliminate any possibility for contact with it.

The largest amount of TCDD contamination discovered in an area accessible to scouts or guests present at the 1981 Boy Scout Jamboree was one sample containing 6.55 ppb TCDD along the northward downgradient from building 225. This area was used for platform tent camping by adults and older scouts working at the Jamboree. This area was not an activity or play area for scouts. Persons sleeping in these tents reportedly slept on cots which were on elevated platforms which covered the ground. These persons would have been present for approximately 2 to 3 weeks. Since these persons would not be expected to have had direct contact with the contaminated soil in the area and incidental soil contact would have occurred for only 2 to 3 weeks, we believe that it is highly unlikely that significant TCDD exposure occurred. No TCDD was found in composite soil samples taken from scout sleeping, showering, eating, or activity areas where soil contact would be expected to occur.

Due to the confined area of TCDD contaminated soils, we believe that successful cleanup of the 1985 Boy Scout Jamboree site can be performed. Upon successful completion of this work the potential for human exposure to TCDD contaminated material would be eliminated, and no TCDD threat to scouts and guests of the 1985 National Boy Scout Jamboree site would be present.

Due to the very small amount of contamination found in areas accessible to scouts and upon reviewing the activities occurring at this location for the short time period, we believe that it is unlikely that any scout or guest of the 1981 Boy Scout Jamboree was exposed to significant amounts of TCDD contaminated soil. We would not, at this time, recommend routine medical monitoring of persons attending the 1981 Jamboree due to the presence of the discovered TCDD.

We have provided for your use a CDC statement regarding TCDD contamination at the 1981 and 1985 Boy Scout Jamboree site at Ft. A. P. Hill, Virginia.

Sincerely yours,

Stephen Margolis, Ph.D.
Environmental Health Manager
Chronic Diseases Division
Center for Environmental Health

The Centers for Disease Control (CDC) has completed its review of the dioxin sampling data from Fort A. P. Hill, Virginia. The CDC confirms its previous statement dated November 14, 1984, namely, ". . . based upon the information we have, the chance of harmful dioxin exposure to scouts during the (1981) Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of scouts at the Jamboree are not necessary or recommended," and "It is our estimate that no harm was done."

The areas in Fort A. P. Hill which were used by the Boy Scouts in 1981 and will be used in 1985--specifically, activity sites, camping sites, and the amphitheatre--are free from dioxin contamination. The only areas in need of remediation are the building in which herbicides were stored and adjacent contaminated soil. It is expected that remediation activities will be completed before commencement of the 1985 Boy Scout Jamboree.

January 15, 1985

cc:
Dr. Houk
Dr. Wiesner
Ms. Jones
Dr. Sampson
Dr. Lybarger
Mr. Tate
Dr. Kimbrough
CDC:CEH:CDD:SSB:JLybarger:jw:mbp:01/15/85:Document 6832

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

January 15, 1985

Dr. Walter F. Lee
U.S. Environmental Protection Agency
Region III
ATTN: 3R W 14
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Dear Dr. Lee:

I am responding to the three sets of Fort A. P. Hill sampling data which were received in this office between Friday, January 11, and Monday, January 14. The materials we received included dioxin results from all sampling sites at Fort A. P. Hill, excluding the internal "wipe" samples from buildings 224, 225, and 226 and the edible fish samples. The internal samples from building 225 are necessary for worker safety concerns and cleanup methodology. The edible fish sample results should be forwarded to this office for analysis of the safety of the source pond for recreational activities. The reviewers included Dr. Eric Sampson, Clinical Chemistry Division, and Mr. Lee Tate, Dr. Jeffrey Lybarger, and Dr. Stephen Margolis of the Chronic Diseases Division.

We reached the following conclusions from the sampling data from Fort A. P. Hill.

1. Each of the 19 analytical batches contained appropriate Performance Audit Samples which were within established control limits.

2. The dioxin levels under building 225 demonstrate dioxin contamination requiring remedial action.

3. The dioxin levels at the fence area surrounding buildings 225 and 224 contain two areas of minimal dioxin contamination: the northeast corner and the southern end. Both areas require remedial actions.

4. The downgradient area between buildings 225 and 229 has dioxin contamination directly aligned with the contamination under building 225 for a distance of approximately 100 feet. This area requires remedial action.

5. The split sample results from the Boy Scouts of America were comparable to the Guy & Davis results, demonstrating no additional contamination from that discussed above.

6. All composite samples from "sprayed" areas were at the "not detected" level.

7. All composite samples from Boy Scout Activity areas, including the amphitheatre and campling areas at the 1981 Jamboree and planned 1985 Jamboree, were at the "not detected" level.

8. All well water sample results were at the "not detected" level.

The initial analysis of the sampling results required extensive time commitment to organize the results before a review could begin. We would request that any future sampling results be presented in a completed form.

We await receipt of your remedial action plan and additional fish sample results.

Sincerely youre,

Stephen Margolis

Stephen Margolis, Ph.D.
Environmental Health Manager
Chronic Diseases Division
Center for Environmental Health

The Centers for Disease Control (CDC) has completed its review of the dioxin sampling data from Fort A. P. Hill, Virginia. The CDC confirms its previous statement dated November 14, 1984, namely, ". . . based upon the information we have, the chance of harmful dioxin exposure to scouts during the (1981) Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of scouts at the Jamboree are not necessary or recommended," and "It is our estimate that no harm was done."

The areas in Fort A. P. Hill which were used by the Boy Scouts in 1981 and will be used in 1985--specifically, activity sites, camping sites, and the amphitheatre--are free from dioxin contamination. The only areas in need of remediation are the building in which herbicides were stored and adjacent contaminated soil. It is expected that remediation activities will be completed before commencement of the 1985 Boy Scout Jamboree.

January 15, 1985

The Menninger Foundation

By: W. Walter Menninger, M.D.
Chairman, National Health and Safety
Boy Scouts of America
Chairman of Health and Safety for
1985 National Scout Jamboree

Chief of Staff, The Menninger Foundation
Topeka, Kansas

At the request of the Chief Scout Executive, a group of consultants was contacted for assistance in evaluation of the reported contamination of the Fort A. P. Hill National Jamboree site. Assistance in identifying appropriate consultants came from the Institute of Medicine of the National Academy of Sciences, of which the Chairman of Boy Scouts of America National Health and Safety Committee is a member.

These consultants are individuals recognized for expertise in clinical epidemiology (the branch of medical science that deals with the incidence, distribution and control of disease in the population). In addition, these consultants have been involved to a significant degree in studies of the effects of the key chemical compound which is the basis for concern - 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD).

The consultants have had the opportunity to review the extensive testing of surface and sub-surface soil samples and well water, carried out separately by a private engineering firm contracted by the Boy Scouts of America and by the U. S. Army. These studies reported a consistent level of contamination immediately under the mixing and storage shed and in the area adjacent to the shed along the fence. Extensive sampling of soil and water outside of the fenced area found no detectable concentration of the TCDD (dioxin) except in a few surface soil samples in the immediate vicinity of the contaminated building. With one exception, all samples outside of the fenced area which were positive were either below or slightly above the 1 part per billion (ppb) concentration of TCDD. (One sample was reported to have 6.55 ppb concentration.)

According to Dr. Renate Kimbrough, who studied extensively the problem of dioxin contamination in Times Beach, MO, and who has edited a definitive text on the effects of dibenzodioxins, "Concentrations below 1 ppb may be found in our environment regardless of whether there was any special contamination, and appear to represent general background contamination of the environment from a variety of sources. Those levels can be considered to be negligible in this situation." Thus concluded Dr. Kimbrough, "The Fort A. P. Hill areas that were accessible to the Scouts were either not contaminated at all or were contaminated with levels below or slightly above 1 ppb. The chances of getting exposed to these levels were exceedingly remote." With regard to concern about exposure, it is relevant that the Jamboree was only a ten-day experience and no Scouts were housed or spent any significant time in areas of even minimal contamination.

As noted by Dr. Robert Miller of the National Cancer Institute, the literature to date, particularly from studies in Seveso, Italy; Times Beach and Moscow Mills, MO, indicate no known effect of TCDD (dioxin) exposure at levels to which the Scouts may have been exposed.

(OVER)

As observed by Dr. Kurland, chairman of Epidemiology at Mayo Clinic, "The likelihood of Jamboree Scouts ingesting, inhaling or having skin contact with particles of soil containing dioxin was so remote that it can be ignored in the sense of any current or future risk."

Based on the information available the consultant group thus concludes that there is no evidence to suggest that Scouts participating in the 1981 National Scout Jamboree had any harmful exposure to TCDD. In their opinion medical examinations or laboratory testing of the Scouts who attended that Jamboree are not necessary or recommended. The Centers for Disease Control concur in this opinion.

With regard to the suitability of Fort A. P. Hill as the site for the 1985 Scout Jamboree, the consultants concur that with an appropriate clean-up and disposal of the contaminated area which has been identified, Fort A. P. Hill, because of the study it has received, will be as safe if not safer than any other area that could be selected for a Jamboree.

Consultants for this project have been:

Elizabeth L. Anderson, M.D., Director
Office of Health & Environmental Assessment
Environmental Protection Agency
Washington DC

George W. Comstock, M.D., DPH
Professor of Epidemiology
Training Center for Public Health Research
Johns Hopkins University
Hagerstown MD

Renate D. Kimbrough, M.D.
Medical Officer, Center
For Environmental Health
Centers for Disease Control
Atlanta GA

Leonard Kurland, M.D., Chairman
and Professor of Epidemiology
Dept of Medical Statistics & Epidemiology
Mayo Clinic
Rochester MN

Robert W. Miller, M.D., Chief
Clinical Epidemiology Branch
National Cancer Institute
Bethesda MD

dr

1/16/85

INFORMATION PAPER

DASG-PSP-O
8 Nov 84

SUBJECT: Health Effects Perspective - Potential Dioxin Exposure at Fort AP Hill

1. Historical Human Exposures to Dioxin

Site	potential levels of exposure	length of exposure	human health effects
Times Beach Mo.	0-980ppb roads, ditches 1-5ppb houses, yards	up to 12 years	none found
Seveso, Italy	1-16ppm	one week	chlorache
Horse Arena Mo.	33ppm	one month	inflamation of bladder chlorache

2. Humans do not appear to be as sensitive to the toxic effects of dioxin as most animal species. Dioxin has been shown to produce cancer in laboratory animals; however, no human cancers have ever been conclusively associated with documented dioxin exposure. It is this potential cancer risk upon which the EPA action level of 1 part per billion is based. Using EPA methods and published assumptions it can be calculated that the additional risk of developing cancer in the Boy Scouts who attended the 1981 Jamboree is less than one in one million over an entire lifetime. This additional risk is comparable to that associated with smoking one cigarette during a lifetime.

3. The acute health effects from dioxin exposure vary greatly among animal species. The acute lethal doses, at the 50 per cent response level, vary over a thousand fold concentration range. No human deaths have been reported from dioxin exposure. Based upon very conservative assumptions, a 84 pound individual would have to consume in a short period 264 pounds of dirt contaminated at 220 parts per billion with dioxin in order to experience serious health effects. Obviously, the possibility of this magnitude of consumption by Boy Scouts or other users of the Fort AP Hill training area is remote if not impossible.

4. Even though the possibility of any adverse health effects among Fort AP Hill users from potential exposure to dioxin is extremely remote, public health policy, as promulgated by the Centers for Disease Control, is to continue to focus on the prevention of any potential health effects. Appropriate efforts to prevent human exposure must continue. This can best be accomplished by the removal and disposal by approved methods of the dioxin contained structure and soil.

COL Dalton/72743
Typed by: Mrs Lee

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SCOUTING/USA

News

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Telephone: 214-659-2000

CONTACT: PRINT - Barclay M. Bollas, Ext. 2271
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FOR RELEASE UPON RECEIPT

NO HEALTH HAZARD AT JAMBOREE, BOY SCOUTS SAY

IRVING, TX, Jan. 17 —— Participants attending the 1981 National Scout Jamboree at Fort A. P. Hill, Virginia, were not exposed to any health hazard, the Boy Scouts of America asserted today.

Scout officials also said results of soil sample testing at the site during the past two months were such that the scheduled summer 1985 jamboree at the same location will be held as planned.

Both announcements were made during a news conference here this afternoon at the organization's national headquarters.

Dr. W. Walter Menninger, chief of staff at the Menninger Foundation, Topeka, Kan., and chairman of BSA's National Health and Safety Committee, said his medical consultant group "concludes that there is no evidence to suggest that Scouts participating in the 1981 National Jamboree had any harmful exposure to TCDD (dioxin). Medical examinations or laboratory testing of the Scouts who attended that jamboree are not necessary or recommended."

Dr. Renate Kimbrough, of the Center for Environmental Health Centers for Disease Control, Atlanta, who was among five medical specialists on Menninger's task force, told Scout officials that the levels "found during the tests can be considered negligible in this situation."

Extensive testing of surface and sub-surface soil samples by a private firm contracted by the Boy Scouts of America did confirm earlier government test results which had revealed dioxin contamination under a fenced-in storage shed at the jamboree site and along an adjacent fence. In addition, slight but insignificant traces of DDT were detected outside the jamboree area.

The storage shed involved was located within the jamboree's communications/public relations compound. Scout officials said the nearest campsite, one used by some youth staff members, was 150 feet from the affected area. No contamination was found in this area.

Samples under the storage shed itself ranged up to 1030 parts per billion, EPA test results showed.

Those samples outside of the fenced area which were positive ranged from 0.32 to 6.55 parts (ppb) per billion. Kimbrough said, however, "it is relevant that the jamboree was only a ten-day experience and no Scouts were housed or spent any significant time in areas of even minimal contamination."

Scout officials noted that at the same time BSA was conducting its soil tests at Fort A. P. Hill, the Environmental Protection Agency also was running its own independent series of tests and that the agency's findings are in agreement with those of the BSA.

The firm of Guy & Davis, of Burke, Va., did the field testing for the Boy Scouts of America. Their test samples were analyzed by the California Analytical Laboratories, Inc., of West Sacramento, Calif. Results of these

tests, as well as those obtained by the Environmental Protection Agency, were then examined by a team of medical specialists in the field of clinical epidemiology.

In addition to Menninger and Kimbrough, this group included Dr. Elizabeth Anderson, director of the Office of Health & Environmental Assessment, Environmental Protection Agency; Dr. George W. Comstock, professor of epidemiology, Training Center for Public Health Research at The John Hopkins University; Dr. Leonard Kurland, chairman and professor of epidemiology, Mayo Clinic; and Dr. Robert W. Miller, chief of the Clinical Epidemiology Branch, National Cancer Institute.

Ben H. Love, BSA's chief Scout executive, confirmed a decision made yesterday by a committee of the organization's top volunteer and professional leaders that the 1985 jamboree scheduled for July 24-30 would be held at the facility as originally planned. Some 30,000 youths and adults will attend.

He further said that after the cleanup and disposal of soil from the small contaminated area, Ft. A. P. Hill "because of the extensive study it has received, it will be the safest area we could possibly select for a jamboree site."

Love said while no health hazard involving attendees at the 1981 event was discovered, Scout officials would insist that all contaminated soil be removed from the contaminated areas.

A U.S. Army spokesman said this task will begin January 18.

Major Jay Craig, Fort A. P. Hill public affairs officer, said that the contaminated soil and shed materials would be placed in sealed EPA and state of Virginia-approved containers and removed to a protected, restricted site at Fort A. P. Hill 6.5 miles from the jamboree area for future disposition.

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#6127P-pmc 152
1/16/85

STEPHEN R. WASSERSUG
DIRECTOR
HAZARDOUS WASTE MANAGEMENT
DIVISION
US EPA RIII
215/597-8131

STATEMENT BY STEPHEN R. WASSERSUG

GOOD MORNING LADIES AND GENTLEMEN. I AM STEPHEN R. WASSERSUG, DIRECTOR OF THE HAZARDOUS WASTE MANAGEMENT DIVISION OF EPA, REGION III. I AM PLEASED TO ANNOUNCE TODAY THE COMMENCEMENT OF REMEDIAL ACTION TO REMOVE DIOXIN AND DDT WASTES AT FORT A. P. HILL, VIRGINIA. THIS WORK IS BEING DONE BY O. H. MATERIALS COMPANY, A CONTRACTOR FOR THE ENVIRONMENTAL PROTECTION AGENCY, UNDER THE TERMS OF AN INTERAGENCY AGREEMENT BETWEEN THE DEPARTMENT OF THE ARMY AND THE ENVIRONMENTAL PROTECTION AGENCY.

AS YOU KNOW, THE POSSIBILITY OF DIOXIN CONTAMINATION AT FORT A. P. HILL WAS DISCUSSED DURING A SURVEY BY THE ARMY ENVIRONMENTAL HYGIENE AGENCY IN MARCH OF 1984. UPON RECOGNITION OF THE POTENTIAL PROBLEM, AEHA SAMPLED SPECIFICALLY FOR DIOXIN UNDER BUILDING 225, AN OLD PESTICIDE STORAGE FACILITY. RESULTS AVAILABLE IN NOVEMBER OF 1984 CONFIRMED THE PRESENCE OF DIOXIN. THE ARMY IMMEDIATELY REQUESTED TECHNICAL ADVICE AND ASSISTANCE FROM EPA AND THE CENTERS FOR DISEASE CONTROL. EPA, AEHA, AND CDC COLLABORATED ON THE DEVELOPMENT OF A SAMPLING PLAN FOR DETERMINING THE EXTENT OF CONTAMINATION AT FORT A. P. HILL. THIS SAMPLING WAS CONDUCTED BY AN EPA CONTRACTOR BETWEEN NOVEMBER 26 AND DECEMBER 7, 1984. RESULTS FROM THIS PROGRAM WERE ANNOUNCED BY THE BOY SCOUTS OF AMERICA ON JANUARY 17, 1985. LEVELS OF DIOXIN RANGING FROM VERY LOW PARTS PER BILLION TO 1000 ppb WERE FOUND UNDER BUILDING 225 AND IMMEDIATELY DOWNGRADIENT OF THE BUILDING. DIOXIN CONTAMINATION IS CONFINED TO AN AREA APPROXIMATELY 30' BY 90' WITH ANOTHER STRIP OF LOW LEVEL (1 ppb) CONTAMINATION ALONG THE BACK AREA OF THE BUILDING. THE ENTIRE CONTAMINATED AREA IS SURROUNDED BY A SECURITY FENCE.

DOCUMENT 18

ESSENTIALLY, NO CONTAMINATION OF AREAS USED BY THE BOY SCOUTS DURING THE 1981 JAMBOREE WAS FOUND. AN EXHAUSTIVE EPA-DIRECTED SITE INVESTIGATION AND SAMPLING PROGRAM ALSO REVEALED THREE SMALL AREAS OF DDT CONTAMINATION FOUND AT PESTICIDE STORAGE AREAS ON THE POST. HOWEVER, THE AREAS OF CONTAMINATION DO NOT INVOLVE AREAS WHERE BOY SCOUT ACTIVITIES OCCURRED DURING THE 1981 JAMBOREE. DIOXIN CONTAMINATION WAS LIMITED TO BUILDING 225 AND ITS IMMEDIATE SURROUNDINGS. THE CDC HAS ISSUED A STATEMENT SAYING, "IT IS OUR ESTIMATE THAT NO HARM WAS DONE." CDC FURTHER STATED THAT ".....THE ONLY AREAS IN NEED OF REMEDIATION ARE THE BUILDINGS IN WHICH HERBICIDES WERE STORED AND ADJACENT CONTAMINATED SOIL."

EPA CONDUCTED A STUDY OF VARIOUS REMEDIAL ALTERNATIVES AND HAS SELECTED A COURSE OF ACTION IN WHICH BOTH THE DEPARTMENT OF THE ARMY AND CDC HAVE CONCURRED. ESSENTIALLY, BUILDING 225 WILL BE DEMOLISHED AND THE MATERIALS DRUMMED. ALL CONTAMINATED SOIL FROM THE AREA WILL BE EXCAVATED AND DRUMMED. THE DRUMS WILL BE TRANSFERRED TO A REMOTE AREA OF FORT A. P. HILL AND STORED UNTIL A PERMANENT METHOD OF DISPOSAL, PROBABLY INCINERATION, IS AVAILABLE. THE THREE DDT-CONTAMINATED AREAS WILL BE HANDLED SIMILARLY. THROUGHOUT THE FUTURE CLEANUP, A SOPHISTICATED PORTABLE LABORATORY WILL BE ON-SCENE TO TEST CONTAMINATED SOILS REMOVED DURING EXCAVATION AND TO CERTIFY THAT NO CONTAMINATION REMAINS AFTER THE CLEANUP IS COMPLETE.

WORK ON-SITE WILL BE DONE BY AN EXPERIENCED EPA CONTRACTOR UNDER THE DIRECTION AND SUPERVISION OF A DEPARTMENT OF THE ARMY ON-SCENE COORDINATOR. EPA AND AEHA TECHNICAL PERSONNEL WILL BE AVAILABLE FOR TECHNICAL CONSULTATION WHENEVER NECESSARY.

News Release

734-4513
734-4004

PUBLIC AFFAIRS OFFICE...U.S. ARMY QUARTERMASTER CENTER
FORT LEE, VIRGINIA 23801

Secretary of the Army John O. Marsh, Jr., was pleased with Boy Scouts of America announcement to hold their 1985 National Jamboree at Fort A.P. Hill as planned. The Army's goal has been to support the Boy Scouts of America and to provide them a location for their jamboree.

The Boy Scout decision was made based upon an independent analysis of all available data resulting from extensive tests conducted by their own independent contractor and by the Environmental Protection Agency. The Centers for Disease Control who have also evaluated this data stated, "The Centers for Disease Control (CDC) has completed its review of the dioxin sampling data from Fort A.P. Hill, Virginia. The CDC confirms its previous statement dated 14 November 1984, namely 'based upon the information we have, the chance of harmful dioxin exposure to scouts during the 1981 Jamboree is exceedingly remote. Therefore, medical examinations or laboratory testing of the scouts at the jamboree are not necessary or recommended. And it is our estimate that no harm was done.'

The areas in Fort A.P. Hill which were used by the Boy Scouts in 1981 and will be used in 1985 -- specifically activities sites, camping sites, and the amphitheater -- are free from dioxin contamination. The only areas in need of remediation are the building in which herbicides were stored and adjacent contaminated soil. It is expected that remediation activities will be completed before commencement of the 1985 Boy Scout Jamboree."

The EPA tests were conducted on samples taken from wells, lakes and soil after earlier tests had indicated the presence of dioxin under and around a formerly used herbicide storage shed. The test results indicate that dioxin contamination is confined to the storage shed itself and the soil under and adjacent to the shed.

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To assure a complete survey, the sampling plan called for testing for pollutants at old herbicide and pesticide storage sites. Concentrations of DDT contaminated soil were found in three areas (the paint and petroleum storage areas near post headquarters and a storage area near the Dirt Bridge Warehouse) none of which were or are to be used by the Boy Scouts. Nevertheless, the clean up will include removing this soil.

Clean up of the contaminated material will begin next week and will be completed well before the jamboree. Clean up will consist of the removal of building 225 and the contaminated soils. These material will be placed in EPA and state approved containers and be temporarily relocated to a secure and remote area of Fort A.P. Hill until an EPA approved disposal facility is identified.

Fort A.P. Hill is located in the northeast portion of Caroline County, Virginia approximately 40 miles north of Richmond and 20 miles southeast of Fredericksburg.

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