



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

January 15, 2004

Lieutenant Colonel Richard W. Jones
State of Indiana Military Department
Office of the Adjutant General
2002 South Holt Road
Indianapolis, IN 46241-4839

REPLY TO THE ATTENTION OF: SE-4J

**Subject: Atterbury Reserve Forces Training Area
Edinburgh, Indiana**

EPA Region 5 Records Ctr.



375105

Dear Lieutenant Colonel Jones:

U.S. Environmental Protection Agency (U.S. EPA) and our contractor Tetra Tech, Inc., have reviewed the Atterbury Reserve Forces Training Area (Camp Atterbury) site background documents, including (1) a final site inspection report prepared for the Military Department of Indiana, (2) a preliminary assessment report prepared for the U.S. Army Environmental Center, and (3) other documents (IDEM 1998 and 2000; Military Department of Indiana 1997 and 2000; Montgomery Watson 1997; Weston 1993). U.S. EPA reviewed these documents to determine whether and to what extent contamination from activities at the Camp Atterbury site pose a threat to human health and the environment. Based on U.S. EPA's findings, U.S. EPA determined the site may pose a risk for the groundwater and surface water migration pathways.

This letter is organized in the following sections to summarize U.S. EPA's findings:

- Site Background
- Potential Source Areas
- Previous Investigations
- Groundwater Migration Pathway
- Surface Water Migration Pathway
- Soil Exposure Pathway
- Air Migration Pathway
- Conclusions and Recommendations
- References

SITE BACKGROUND

The Camp Atterbury site is located in Johnson, Brown, and Bartholomew counties in south-central Indiana about 35 miles south-southeast of Indianapolis. In 1942, the 40,000-acre site opened as a training site for the 83rd Infantry Division. In 1946, the Camp Atterbury site was deactivated. In 1950, the site was reactivated for training of the 28th and 31st Infantry Divisions. Between 1954 and 1968, the Camp Atterbury site was used to train U.S. Army National Guard and Reserve troops and as a munitions testing and monitoring site. In 1968, approximately 7,000 acres of the northern portion of the site were sold and became the Atterbury State Fish and Wildlife Area. This area has not been investigated, and it is unknown if potential source areas exist in this former portion of the site. The site is currently used as a weekend and annual training site for the U.S. Army National Guard.

POTENTIAL SOURCE AREAS

Five source areas have been identified, including (1) the wastewater sludge lagoon area, (2) the impact area, (3) the old landfill, (4) wash rack areas, and (5) battery acid disposal areas. The wastewater sludge lagoon area is part of the on-site wastewater treatment plant located in the northeastern portion of the Camp Atterbury site and consists of two likely unlined surface impoundments. One surface impoundment measures approximately 400 by 300 feet, and the second surface impoundment measures approximately 300 by 150 feet, with a total area of 165,000 square feet (ft²). Contaminants in wastewater treatment sludge such as phosphorus, metals, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) may leach from the surface impoundment to soil and groundwater. The depth of the wastewater sludge lagoons and their dates of operation are unknown.

The 6,000-acre impact area, including the air-to-ground impact range, is located in the central portion of the Camp Atterbury site and has been in operation since 1942. The impact area is currently used for air-to-ground and ground-to-ground firing of munitions. Several small arms firing ranges are also located within its confines. Potential contaminants of concern include phosphorus and metals from munitions. White phosphorus munition rounds were formerly fired over wetlands in the impact area. This practice was discontinued because of concern regarding phosphorus-related waterfowl mortality, but the wetlands likely are impacted by previous releases of phosphorus.

The old landfill operated from 1969 to 1980 and is located in the eastern portion of the Camp Atterbury site north of the intersection of County Line and Mauxferry Roads. The landfill measures approximately 900 by 300 feet and is presumably unlined. The depth of the landfill is unknown. The landfill received construction debris generated during the demolition of former barracks located on former Camp Atterbury property that is now part of the Atterbury State Fish and Wildlife Area. Small amounts of fuel were used to ignite the debris. Other wastes that may have been deposited there include petroleum, oil, and lubricant wastes; asbestos (from brake linings and transite tiles); pentachlorophenol (treated wooden boxes); solvents (from painting, maintenance, and other activities); and general refuse. The old landfill was located adjacent to a former incinerator; however, no information is available regarding the incinerator. Also, no information is available regarding waste management activities prior to the creation of the old landfill. Another landfill, the new landfill, is located on site but was not evaluated because the unit is being closed under the Resource Conservation and Recovery Act (RCRA).

High-pressure wash rack areas (three concrete pads totaling 3,000 ft²) are present in the northern portion of the Camp Atterbury site south of 21st Street. These wash rack areas were used to clean large vehicles and engines, and wash water drains northeast to a large unlined ditch. The ditch flows south to a small standing water body containing dense vegetation. Potential contaminants of concern include oil and grease, petroleum hydrocarbons, VOCs, SVOCs, and metals. Operation dates are unknown; however, these areas are assumed to have operated since 1942.

Three battery acid disposal areas are present at the Camp Atterbury site, two at Building 123 and one at Building 595. At Building 123, lead acid vehicle batteries were placed upside down on a wooden pallet in a 4- by 4-foot pit located northeast of the building. This practice began in 1972 and continued until 1976 or 1978. From 1976 or 1978 until 1989, battery acids were neutralized in an aboveground storage tank located just east of Building 123. Acids were placed in the tank and neutralized with soda. Fluids were subsequently discharged to the ground surface adjacent to the tank or possibly to a nearby ditch that flows along the southern boundary of this area. No information is available regarding the size of the tank or the areal extent of the surficial liquid discharge area; U.S. EPA estimated a 10- by 10-foot areal extent. At Building 595, a battery room with a sink is located inside the northern portion of the building. A drain pipe exits the sink and discharges to the subsurface just east of the battery room. During repeated repair of a metal sewer pipe north of Building 595, stained soils were observed down to approximately 6 feet below ground surface (bgs). No stained soil was removed during sewer repair activities.

A source location figure is presented in Enclosure 1.

PREVIOUS INVESTIGATIONS

In 1992, Alt & Witzig Engineering, Inc. (A&W), conducted two investigations at the Camp Atterbury site: (1) a post-maintenance areas and ditch systems sampling investigation and (2) a stream survey and shop discharge sampling investigation. During the post-maintenance areas and ditch systems sampling investigation, 12 shallow soil borings were advanced to 4 feet bgs. Composite samples were collected from each boring from 6 inches to 4 feet bgs. The samples contained up to 1.58 milligrams per kilogram (mg/kg) of cadmium and up to 68.5 mg/kg of lead in the high-pressure wash rack area, up to 16.7 mg/kg of chromium in the Schoolhouse Road wash rack area, and up to 92.8 mg/kg of total petroleum hydrocarbons (TPH) in an on-site ditch. During the stream survey and shop discharge sampling investigation, 18 locations were sampled for pH, biological oxygen demand (BOD), suspended solids, phosphates, nitrate, oil and grease, nitrogen ammonia, total Kjeldahl nitrogen, chemical oxygen demand (COD), and benzene. All parameters except BOD and COD were generally consistent with established background levels. The elevated COD level was attributed to high rainfall during the day of sampling, and the elevated BOD level at one location could not be definitely attributed to a cause. The reports prepared as a result of these investigations were not available to U.S. EPA for review; however, report results are summarized in other investigation reports reviewed by U.S. EPA. It should be noted that no quality assurance or quality control data are available for these investigations, this information may be requested by U.S. EPA if determined essential.

In 1993, a preliminary assessment (PA) of the Camp Atterbury site was conducted on behalf of the U. S. Army Environmental Center. The PA identified several areas of concern, including the old and new landfills, the impact area, an air-to-ground impact range within the impact area, a suspected agent burning area, a chemical agent identification set area within the impact area, and an area of suspected polychlorinated biphenyl (PCB) transformers. The PA recommended a complete hydrogeological investigation of the site. The Indiana Department of Environmental Management (IDEM) concurred and also expressed concern about private drinking water wells located along the southeast boundary of the Camp Atterbury site.

In 1997, a final site investigation (SI) report for the Camp Atterbury site was prepared on behalf of the Military Department of Indiana. The SI included sampling investigations at five source areas: (1) the wastewater sludge lagoon area, (2) the impact area, (3) the old landfill, (4) wash rack areas, and (5) battery acid disposal areas. At the wastewater sludge lagoon area, phosphorus was detected in groundwater at up to 0.85 milligrams per liter (mg/L), in soil at up to 230 mg/kg, and in sludge at up to 790 mg/kg. Low concentrations of metals were detected in groundwater, and zinc was detected at up to 55 mg/kg in soil below the surface impoundments. At the impact area, five sediment samples were collected from streams exiting the impact area. No background locations were sampled during the investigation. Phosphorus was detected in on-site stream sediments at concentrations of 22 to 210 mg/kg, and zinc was detected at concentrations of 8.6 to 38 mg/kg. In the old landfill area, one new monitoring well was installed upgradient of the landfill, and the new and existing monitoring wells in the vicinity of the new landfill were sampled to characterize groundwater in the area; however, the new landfill and associated monitoring wells are approximately ½ mile southeast of the old landfill, and no monitoring wells are located immediately downgradient of the old landfill. In the wash rack areas, soil samples collected from 0 to 2.5 feet bgs at five sampling locations were analyzed for TPH, gasoline range organics (GRO), and diesel range organics (DRO). Some samples were also analyzed for VOCs and SVOCs. TPH was detected at concentrations up to 19,000 mg/kg, and DRO was detected at concentrations up to 230 mg/kg. VOCs and SVOCs were not detected. At the battery acid disposal areas, three monitoring wells were installed and three soil borings were advanced to 20 feet bgs. Groundwater was sampled for metals, and only low concentrations of manganese were detected; however, two of the three monitoring wells (MW-12 and MW-13) are not located downgradient of the

source areas. Soil was sampled for pH and lead only. Lead was detected at up to 31 mg/kg; however, as IDEM noted, one of the soil sampling locations (BA-SS03) appeared to be 200 feet upgradient of the source area.

A supplemental SI was conducted at the Camp Atterbury site in 1996; however, the associated report was not available to EPA for review. A summary of supplemental SI activities was provided in the 1997 Camp Atterbury decision document prepared by the Military Department of Indiana. The supplemental SI included monitoring well installation supposedly downgradient of the old landfill and soil sample collection at the unit training equipment storage area (UTES), where spraying of waste oil on the ground surface was historically conducted as a method of dust suppression. No constituents were present at concentrations above IDEM voluntary remediation program Tier II non-residential cleanup criteria.

In 1998, a SI was conducted at the chemical warfare material source area previously identified in the PA as the suspected agent burning area. Between 1968 and 1970, 25 one-gallon cans of a thick liquid substance suspected to be blister (mustard) agent were burned in an area located approximately ½-mile west of the impact area's northwest corner. Ten soil borings were collected at the source area and three sediment samples were collected from a nearby stream. No blister agent or associated breakdown compounds were detected in any of the samples collected. The Military Department of Indiana prepared a no further remedial action planned (NFRAP) decision document for this area. IDEM concurred that the analytical results supported no further action.

In 1998, IDEM staff provided comments on the Army's decision document for NFRAP for the Camp Atterbury site. IDEM staff concurred that No Further Action was appropriate for five areas and recommended additional sampling/source removal at a sixth area.

GROUNDWATER MIGRATION PATHWAY

Groundwater at the site flows east-southeast toward Driftwood River. Private and municipal drinking water wells are screened at between 66 to 120 feet bgs, and based on available hydrogeologic data, all aquifers are likely interconnected.

Eight private drinking water wells are located within 1 mile of on-site source areas. Also, several municipal drinking water wells are located within 4 miles of the site. Three municipal well fields, Prince's Lakes, Edinburgh, and Eastern Bartholomew County, are located within 2 to 3 miles from on-site sources and serve a total population of 21,000. Private drinking water wells may be impacted by the site; therefore, scoresheets for the groundwater migration pathway are enclosed. The contribution of the groundwater migration pathway to the overall site score is considered to be significant.

SURFACE WATER MIGRATION PATHWAY

No drinking water intakes are located along the target distance limit for the Camp Atterbury site; therefore, the contribution of the site-related threat to drinking water based on the surface water migration pathway score is minimal.

During the 1997 SI, phosphorus was detected in the sediment of on-site streams at concentrations of 22 to 210 mg/kg. As mentioned previously, white phosphorus munition rounds were formerly fired over wetlands in the impact area. This practice was discontinued because of concern regarding phosphorus-related water fowl mortality, but the wetlands are impacted by previous likely releases of phosphorus. In addition to phosphorus, metals such as zinc have been detected in on-site sediment samples at elevated concentrations. Zinc concentrations ranged from 8.6 to 38 mg/kg. Although no background sediment samples were collected, the lowest concentration of each contaminant of concern was significantly lower than the highest concentration of the contaminant detected. The on-site streams are likely fisheries off

the Camp Atterbury property. Also, the Atterbury State Fish and Wildlife Area is present within the target distance limit.

The 24 miles of wetland frontage along the target distance limit is subject to potential site-related contamination. Of the 24 miles, 4 are located along Nineveh and Muddy Branch Creeks and 20 are located along the Driftwood River. A dilution factor of 1 was assumed for Nineveh and Muddy Branch Creeks because they are minimal streams (that is, they each have a flow of less than 10 cubic feet per second). The Driftwood River has a flow of 1,000 to 10,000 cubic feet per second.

The contribution to the overall score for the site based on the threat to human food chain and environment from the surface water migration pathway is considered to be significant. If contamination of on- or off-site wetlands were discovered, the contribution of this migration pathway to the site score would be significant.

SOIL EXPOSURE PATHWAY

No residences or schools are known to be located within 200 feet of documented soil contamination.

AIR MIGRATION PATHWAY

No release of contaminants from the Camp Atterbury site to air has been documented, and the site is vegetated; therefore, it is thought the air migration pathway contributes minimally to the overall site score.

CONCLUSIONS AND RECOMMENDATIONS

The preliminary HRS score for the Camp Atterbury site appears to be greater than 28.50, indicating that the site may be a candidate for the National Priorities List (NPL). Several data gaps exist with regard to the site, including the following: (1) inadequate characterization of on-site sources, (2) potentially significant contamination of on-site wetlands within the impact area, (3) lack of sample analytical results for several contaminants of potential concern in groundwater, and (4) no background sediment sampling location identified. Specific data gaps are listed below:

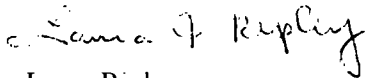
- No information regarding potential source areas or lack of potential source areas in the 7,000-acre northern portion of the site that became the Atterbury State Fish and Wildlife Area is provided.
- No information is available regarding the former incinerator site located adjacent to the old landfill.
- No information is provided regarding waste management practices prior to the creation of the old landfill in 1969.
- No sediment background locations were evaluated during 1997 SI.
- From the information that EPA was given, no monitoring wells appear to be located immediately downgradient of the old landfill. However, in speaking with IDEM, monitoring wells may have been installed downgradient of the old landfill during the supplemental Site Investigation. In addition, there may be some biannual groundwater sampling reports for the 1997 to 1999 timeframe which show the analytical results of the three monitoring wells; two east and one south of the old landfill area. Please provide this information to EPA.
- In the battery acid disposal areas, no soil borings or monitoring wells appear to have been installed at the sources or appropriately downgradient of the sources.
- In the wash rack areas, most soil analytical results did not include individual constituents only groups of constituents such as TPH, DRO, and GRO, which could not be

specifically evaluated. Several concentrations of TPH exceeded IDEM's Leaking Underground Storage Tank guidance.

U.S. EPA recommends that additional groundwater, sediment, and soil investigations be performed at the site to address these data gaps. Also, U.S. EPA recommends that the supplemental SI report, most recent new landfill monitoring well analytical results, and information regarding the number and location of any full-time on-site residents be submitted to us for review.

If you have any questions regarding this submittal, please call me at (312) 886-6040.

Sincerely,



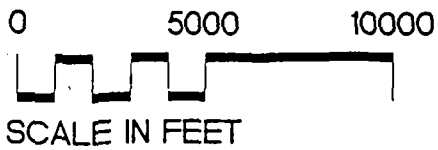
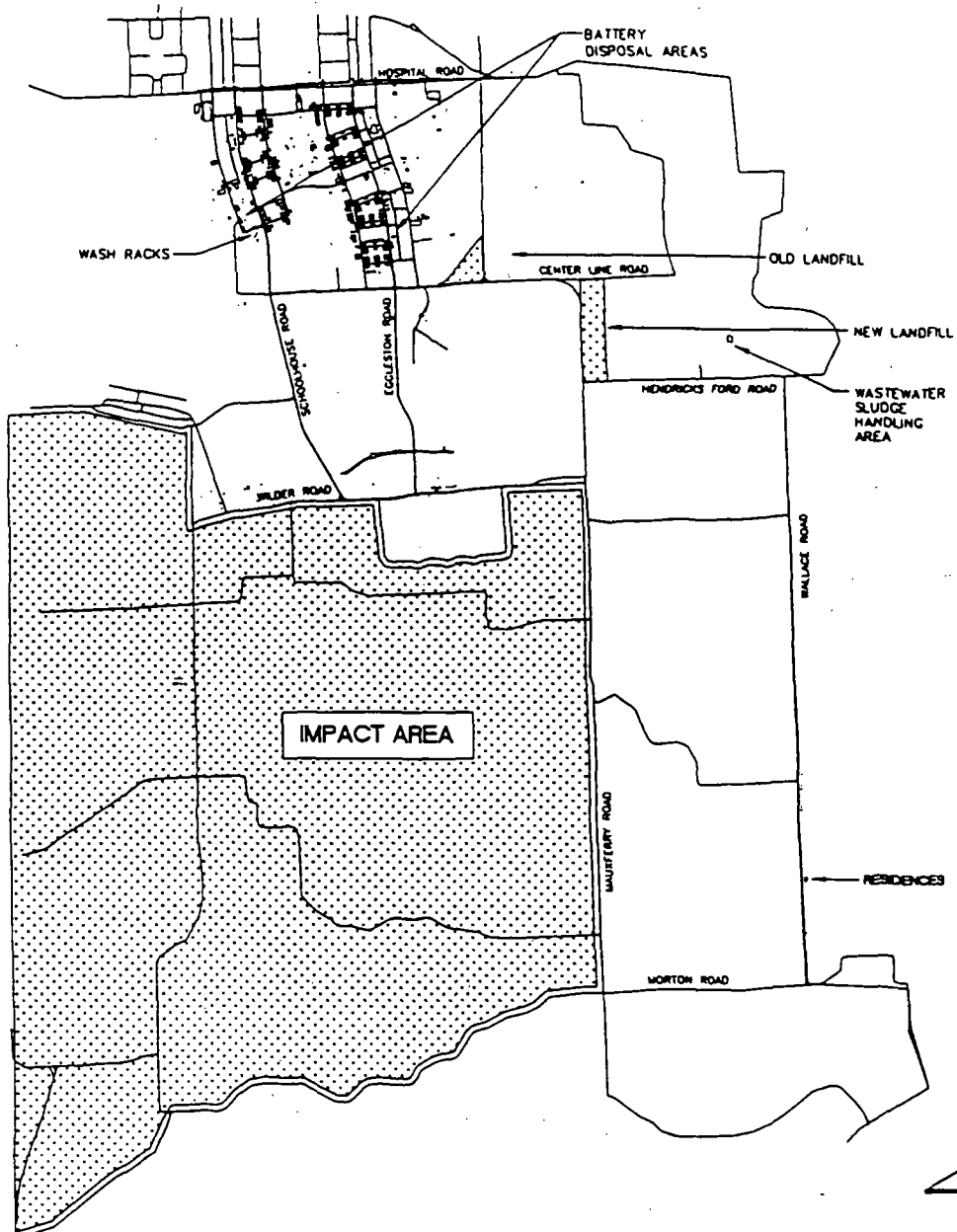
Laura Ripley
U.S. EPA, Region 5
Federal Docket Coordinator

Enclosures (1)

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cc: Sandy Anagnostopolous, Tetra Tech

ENCLOSURE 1
SOURCE LOCATIONS FIGURE
(1 Page)



Atterbury Reserve Forces Training Area
 Edenburgh, Indiana

Source Locations

 Tetra Tech EM Inc.

SOURCE: Modified from Montgomery Watson 1997.