



**K I SAWYER AFB
MICHIGAN**

**ADMINISTRATIVE RECORD
COVER SHEET**

AR File Number 470



470 1
DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 410TH SUPPORT GROUP (ACC)
K I SAWYER AIR FORCE BASE, MICHIGAN

File:
N.R. 27-C

470

2 NOV 1994

MEMORANDUM FOR ALL RESTORATION ADVISORY BOARD MEMBERS

FROM: 410 CES/CEV
400 C Avenue Suite 100
K. I. Sawyer AFB MI 49843-3200

SUBJECT: Final Revision of Documents Available for Review

Attached is the executive summary from the final Environmental Baseline Survey (EBS) and the final Remedial Investigation (RI) Report for seven sites at K.I. Sawyer AFB.

Both documents are available for your review at the Peter White Library. The EBS is located in file number 414 and the four volume RI report is located in file numbers 415 - 418. Also a second copy of both documents has been provided to the library for your check-out. Please see the reference librarian for location and availability.

You may also review both documents in the Environmental Office at K.I. Sawyer AFB by making arrangements with me at 372-2342.

GARY R. KOSKI
BRAC Environmental Coordinator

Attachment:
Executive Summary

Global Power for America

BASEWIDE ENVIRONMENTAL BASELINE SURVEY

K. I. SAWYER AIR FORCE BASE, MICHIGAN

AUGUST 29, 1994

EXECUTIVE SUMMARY

This Environmental Baseline Survey (EBS) has been prepared to document the environmental condition of real property at K. I. Sawyer Air Force Base (AFB), Michigan, resulting from the storage, release, and disposal of hazardous substances and petroleum products and their derivatives over the installation's history. Although primarily a management tool, this EBS is also used by the Air Force to meet its obligations under the Comprehensive Environmental, Compensation and Liability Act (CERCLA), 42 United States Code Section 9620(h)(1), as amended by the Community Environmental Response Facilitation Act (CERFA) (Public Law 102-426).

Table ES-1 is a listing of all Category 1 uncontaminated property based on information obtained through a records search, interviews, and visual inspections at K. I. Sawyer AFB; Figure ES-1 depicts their respective locations. The Air Force submits this EBS for your concurrence on Department of Defense Environmental Category 1 "uncontaminated" property in accordance with CERCLA Section 120(h)(4), as amended by CERFA.

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Table ES-1. Category 1 Properties
Page 1 of 3

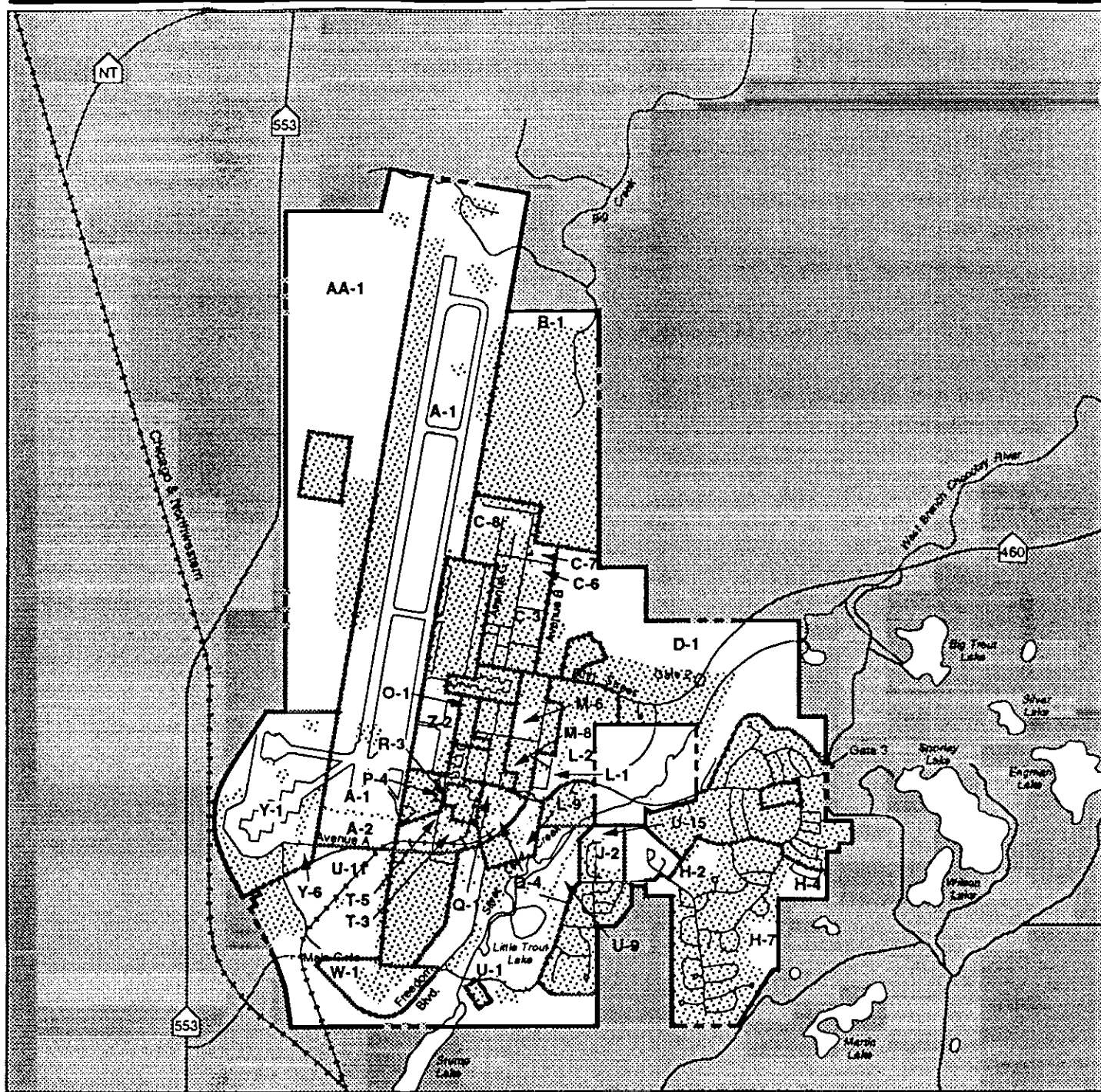
Areas and Associated Facilities	Acres	Square Feet
Study Area A-1	714.63	
Facility 5082 (ILS Glide Slope)		192
Facility 7078 (Transmissometer)		NA
Study Area A-2		
Land south of runway, west of Facility 337	37.65	
Study Area B-1		
Land north of Facility 5029	23.82	
Study Area C-3	11.24	
Facility 710 (Squadron Operations)		14,600
Study Area C-6		
Land southeast of Facility 735	4.75	
Study Area C-7		
Land due east of Facility 735	4.83	
Study Area C-8	32.46	
Facility 747 (Control Tower)		6,338
Study Area D-1	328.03	
Facility 1031 (Water Supply Facility)		234
Golf Course		NA
Study Area H-2		
Land at the intersection of Panther and Aircobra Streets	26.99	
Study Area H-4		
Trailer Court	17.12	
Study Area H-7		
Land due east of Facility 1558	26.98	
Study Area I-1		
K. I. Sawyer Elementary School	35.84	
Study Area J-2		
Land northwest of K. I. Sawyer Elementary School	18.46	
Study Area L-1	23.83	
Facility 810 (Airmen's Dormitory)		23,178
Facility 811 (Airmen's Dormitory)		25,955
Facility 814 (Airmen's Dormitory)		25,084
Facility 815 (Airmen's Dormitory)		30,742
Facility 816 (Veterinary Clinic)		2,800

Table ES-1. Category 1 Properties
Page 2 of 3






Areas and Associated Facilities	Acres	Square Feet
Study Area L-2	23.64	
Facility 829 (Housing Supplies and Storage Facility)		539
Facility 5062 (Recreation Court)		NA
Study Area L-8	5.67	
Facility 802 (Visiting Officers' Quarters)		10,015
Facility 803 (Officers' Quarters)		10,015
Facility 5038 (Solid Waste Repository)		3,604
Study Area L-9	10.77	
Facility 801 (Visiting Airmen's Quarters Dormitory)		11,654
Facility 805 (Officers' Quarters)		9,105
Facility 806 (Visiting Officers' Quarters)		2,988
Study Area M-6	10.59	
Facility 631 (Commissary)		3,282
Facility 633 (Clothing Store)		3,631
Facility 634 (Commissary)		43,502
Facility 646 (Bank)		NA
Facility 648 (Credit Union)		NA
Study Area M-8	4.66	
Facility 503 (Base Chapel)		10,374
Study Area M-11	2.10	
Facility 512 (Personnel Office)		9,562
Study Area M-13		
Land north of Facility 648	1.31	
Study Area O-1	2.33	
Facility 621 (Parking Shed)		1,401
Study Area O-2		
Land north and east of Facility 621	1.77	
Study Area P-4	1.85	
Facility 403 (Maintenance Squadron)		13,456
Facility 407 (Parking Shed)		2,760
Study Area Q-1		
Land south of Facility 511	7.01	
Study Area Q-4		
Land north of Facility 417	2.39	
Study Area R-3		
Land north of Facility 415	1.77	

Table ES-1. Category 1 Properties
Page 3 of 3

Areas and Associated Facilities	Acres	Square Feet
Study Area S-1		
Land north of Facility 400	8.68	
Study Area T-2		
Land north of Facility 7084	16.67	
Study Area T-3		
Land on Avenue A south of Facility 7024	8.23	
Study Area T-5		
Land north of Facility 444	4.73	
Study Area U-1	454.40	
Facility 102 (Traffic Check House)		252
Facility 5094 (Recreation Pavilion)		2,123
Facility 5151 (Family Camps)		NA
Facility 5152 (Recreation Court)		NA
Facility 5156 (Recreation Court)		NA
Facility 5159 (Recreation Court)		996
Study Area U-9		
Land on Scorpion Street northeast of Facility 5094	17.81	
Study Area U-11		
Land north of Facility 101	32.45	
Study Area U-15		
Land south of Facility 4006	2.46	
Study Area W-1		
Land north of Freedom Boulevard and east of Facility 102	48.87	
Study Area Y-1		
Alert Apron	162.70	
Study Area Y-6		
Land east of Facility 110	8.80	
Study Area Z-2		
Land in eastern portion of runway apron	52.30	
Study Area AA-1		
Land north of Facility 112	589.55	



EXPLANATION

-  Uncontaminated Property (Category 1)
-  Other On-Base Property
-  Study Area
-  Off-Base Property
-  Base Boundary

Category 1 Properties



Figure ES-1

S.0 SUMMARY

S.1 BACKGROUND

This Environmental Baseline Survey (EBS) has been prepared to document the environmental condition of real property at K. I. Sawyer Air Force Base (AFB), Michigan, resulting from the storage, release, and disposal of hazardous substances and petroleum products and their derivatives over the installation's history, and establish a baseline for use by the Air Force in making decisions concerning real property transactions. The preparation of an EBS is required by Department of Defense (DOD) policy before any property can be sold, leased, transferred, or acquired. Although primarily a management tool, this EBS will also be used by the Air Force in meeting its obligations under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 United States Code (U.S.C.) Section 9620(h), as amended by the Community Environmental Response Facilitation Act (CERFA) (Public Law 102-426).

S.1.1 CERFA Requirements

CERFA was enacted to facilitate the rapid return to local communities of uncontaminated properties identified during the Base Realignment and Closure (BRAC) process. Uncontaminated property refers to real property on which no hazardous substances and no petroleum products or their derivatives were stored for 1 year or more, or are known to have been released or disposed of. In order to identify uncontaminated properties on military installations scheduled for closure or realignment, an EBS is conducted and the results documented in a report. This EBS is based on existing environmental information related to the past and present storage, release, or disposal of hazardous substances on the installation.

This EBS is based on information obtained through a records search, interviews, and visual inspections. The records search included a review of all available Air Force and other agency records including environmental restoration and compliance reports, audits, surveys, facility drawings, and inspection reports; an analysis of aerial photographs; and a review of recorded chain-of-title documents for the property. Interviews with current and former employees and visual inspections of the base property and facilities were also conducted. The EBS also includes an assessment of the environmental condition of off-base properties immediately adjacent (contiguous) to or relatively near the base that could pose environmental concern and/or affect the subject property. Physical inspections were conducted, on contiguous off-base properties where access was authorized by the owner or operator; a visual survey was conducted when authorization was not obtained or a survey was not considered necessary.

Based on an analysis of the available data, property on K. I. Sawyer AFB was classified into one of seven categories:

- *Category 1* - Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.
- *Category 2* - Areas where only storage of hazardous substances or petroleum products has occurred, but no release, disposal, or migration from adjacent areas has occurred.
- *Category 3* - Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but at concentrations that do not require a removal or remedial action.
- *Category 4* - Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
- *Category 5* - Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, removal and/or remedial actions are under way, but all required remedial actions have not yet been taken.
- *Category 6* - Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been implemented.
- *Category 7* - Areas that are unevaluated or require additional evaluation.

Pursuant to U.S. Environmental Protection Agency (EPA) guidance and in order to fully implement Congress' intent to allow expeditious disposal of uncontaminated parcels of property for economic redevelopment, this EBS identifies property as uncontaminated under CERCLA Section 120(h)(4), even if some limited quantity of hazardous substances or petroleum products were stored, released, or disposed of in cases where the available information indicates that such storage, release, or disposal poses no threat to human health or the environment. Examples, as provided in the U.S. EPA guidance include: usage of common household chemicals and storage of heating fuel in base housing areas, incidental releases of petroleum products on roadways and parking lots, and the routine licensed application of pesticides (U.S. EPA, 1994).

Property in the first four categories would be suitable for transfer by deed. Property in the last three categories would be unsuitable for transfer by deed

until all necessary actions have been taken and the property has been reclassified into one of the first four categories. Leases would be considered on a case-by-case basis for properties within all seven categories.

S.2 FINDINGS

S.2.1 Property Categorization Factors/Resources

S.2.1.1 Environmental Factors. The following resources were used in property categorization. Each resource was categorized individually; findings for each resource were then reviewed to obtain the overall property category.

Category 2 through 7 properties were identified based upon the methodology presented in Chapter 2. Areas where no past or present storage, release, or disposal of hazardous substances or petroleum products and their derivatives were identified are considered to be Category 1 properties.

Areas where hazardous materials were stored and/or hazardous waste was generated were considered Category 2 properties unless a suspected or confirmed release was identified.

Category 3 designations were based upon existing documentation (e.g., personnel interviews, visual site inspections, written records, reports) to document that contaminant levels, if present, are below the applicable or relevant and appropriate requirements, as identified and determined by Section 7.6 of the Federal Facility Agreement, as required by CERCLA 121(d)(2)(A)(ii), 42 U.S.C. Section 9621(d)(2)(A)(ii). ARARs are re-examined throughout the remedial investigation/feasibility study (RI/FS) process until a Record of Decision is issued.

Areas where known or suspected contamination has occurred were classified as Category 4 through 7 properties based upon the current program status. In addition, new areas of potential contamination identified as a result of the EBS were classified as Category 7 properties.

Hazardous Substance and Petroleum Product Storage. Hazardous materials are stored at K. I. Sawyer AFB in connection with flightline, mission support, base support, and various industrial operations. These hazardous materials include jet and motor fuels, other types of petroleum products, paints, thinners, adhesives, cleaners, lead-acid batteries, pesticides, hydraulic fluids, and halogenated and nonhalogenated solvents. Hazardous materials are or have been stored at 89 locations throughout the base.

Hazardous waste and waste petroleum products are or were stored at 58 locations throughout the base. Fourteen areas of concern (AOCs) and 112

solid waste management units (SWMUs) have been identified as possible areas of contamination. Additionally, 11 baseball fields on base were constructed using stamp soils.

Installation Restoration Program Sites. Twenty-four Installation Restoration Program (IRP) sites have been identified at K. I. Sawyer AFB. Of the 24 sites, thermal treatment of soil has been completed at the Soil Remediation Area (ST-16), and four sites (LF-12, OT-14, OT-15, and ST-22) were closed out in 1994 upon U.S. EPA Region V and Michigan Department of Natural Resources approval of the No Further Action Decision Documents submitted by K. I. Sawyer AFB. The remaining 19 sites are undergoing various RI/FSSs; with interim remedial actions in progress at site DP-02; soil bioventing at Sites ST-04, SS-05, FT-06, and FT-07. Remedial action is being conducted at Site DP-03.

Storage Tanks and Pipeline Systems. Past and present locations of aboveground storage tanks (ASTs), underground storage tanks (USTs), and hydrant fueling and pipeline systems were identified. Storage tanks at K. I. Sawyer AFB have been used to store various petroleum products or wastes, and other miscellaneous products. There have been 1,036 ASTs and 597 USTs utilized at K. I. Sawyer AFB. Two constant-pressure hydrant fuel systems are in use at K. I. Sawyer AFB.

Wastewater Treatment and Disposal. Past and present locations of sanitary sewers, oil/water separators (OWSs), septic tank systems, silver recovery systems, wash racks, sand traps, grease traps, and french drains were identified. There have been 12 OWSs, 17 septic tank systems, 4 silver recovery systems, 7 wash racks, 4 sand traps, 7 grease traps, and 2 french drains utilized at K. I. Sawyer AFB. Wastewater is discharged to the sanitary sewer, then to the on-base sewage treatment plant.

Pesticides. Most pesticides utilized at K. I. Sawyer AFB are stored in Facility 414 (Entomology Shop). Some pesticides are stored in Facility 786 at the golf course. Pest management for the base, including the golf course, is accomplished under the supervision of a DOD-and state-certified pesticide applicator.

Ordnance. There are six areas on base where ordnance has been used or disposed of through burning or detonation: two former Grenade Ranges, the Machine Gun Range (Facility 868), the Small Arms Range (Facility 5023), Explosive Ordnance Disposal Range (Facility 5029), and the Grenade Launching Range (Facility 5044).

Medical/Biohazardous Waste. K. I. Sawyer AFB operates a 15-bed hospital that provides basic inpatient and outpatient care (Facility 850). The Dental Clinic is within Facility 850. Until 1992, medical wastes were disposed of

using an incinerator. Medical waste is currently picked up by a licensed contractor on a weekly basis.

Radioactive Materials and Mixed Waste. Radioactive materials are currently stored at two locations on base. These locations are within Facility 404 Precision Measurement Equipment Laboratory (PMEL) and Facility 521 (Heat Plant). The types of radioactive materials utilized and stored at Facility 404 include Cesium-137, Plutonium-239, Krypton-85, and Thorium-232. Facility 521 utilizes Cesium-137 only. Additional radioactive materials that are stored at numerous locations on base include lensatic compasses and radioluminescent exit signs.

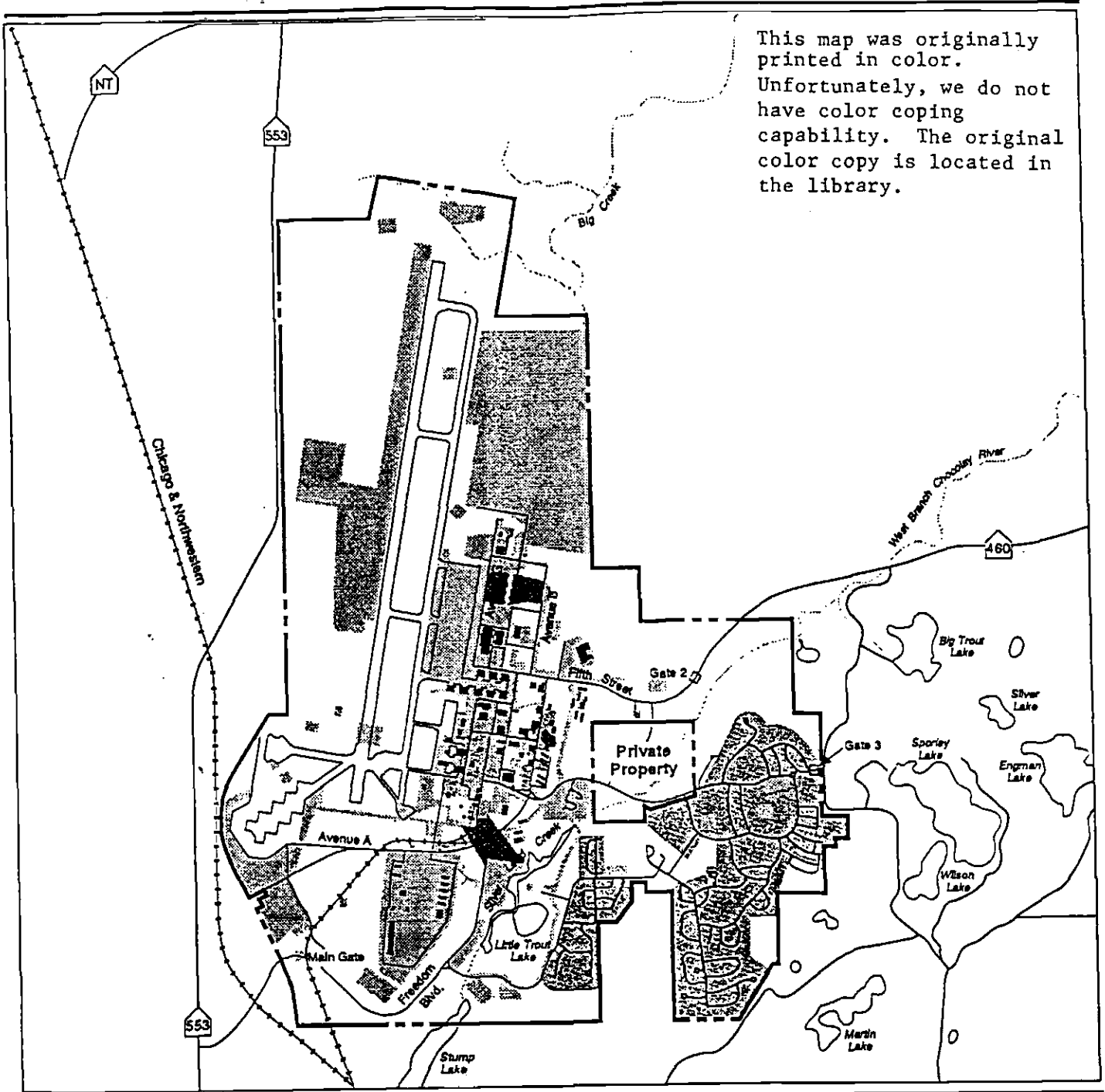
Past storage of radioactive materials include a Night-Vision Adaptometer that used Radium-226, stored at the Bioenvironmental Engineering Office located at Facility 850 (Hospital). Facility 531 (Civil Engineering) stored a "Troloxer" moisture density nuclear gauge that utilized Americium-241. It is also possible that photometers with radioactive sources of Carbon-14 and/or Hydrogen-3 were utilized or stored at Facility 725 (General Purpose Aircraft Shop). Several avionics and aircraft maintenance shops may have dealt with instruments containing radium paint or electron tubes. Equipment calibration facilities, radar, and communications operations may have utilized various radioactive sources as well. No evidence of generation or storage of mixed waste was identified based on the records search and VSIs conducted.

Mercury. Mercury and/or equipment containing mercury are stored at Facility 404 (PMEL), Facility 427 (Base Weather Station), Facility 850 (Hospital), and Facility 816 (Veterinary Clinic).

Deicing Agents. K. I. Sawyer AFB uses ethylene glycol and propylene glycol for the deicing of aircraft during the October through April time period. The primary deicing area is the Operational Apron. Other areas where deicing occurs or has occurred include the Alert Apron, Transient Apron, and the hammerheads at the ends of the primary runway.

S.2.1.2 Property Resources. As described above, property on K. I. Sawyer AFB was classified into one of seven categories based on the findings of this EBS (Figure S-1). Category 1 properties are generally in the western and southern portion of K. I. Sawyer AFB and include the runway, aircraft apron, and area surrounding the weapons storage area. Category 2 properties occur east of the flightline, north of the weapons storage area in the southeast portion of the base, east of the main cantonment area, and include military/family housing, and hazardous material/waste storage areas. Additionally, two IRP sites have been designated as Category 2 properties. Category 3, properties include stamp soil areas, and IRP Site LF-12. Category 4, 5, and 6 properties include areas being investigated under the IRP, or areas associated with groundwater plumes. Category 7 properties include areas associated with IRP sites, SWMU locations, AOCs, and

This map was originally printed in color. Unfortunately, we do not have color coping capability. The original color copy is located in the library.



EXPLANATION

- | | |
|---|---|
| Uncontaminated Property (Category 1) | Hazardous substance release, not all actions have been taken (Category 5) |
| Hazardous substance stored - no release (Category 2) | Hazardous substance release, no actions taken (Category 6) |
| Hazardous substance release, below action levels (Category 3) | Areas requiring additional evaluation (Category 7) |
| Hazardous substance release, all actions have been taken (Category 4) | Base Boundary |

Property Categorization



Figure S-1

locations identified during visual site inspections and visual reconnaissance surveys.

S.2.2 Disclosure Factors

Information on six disclosure factors (asbestos, polychlorinated biphenyls [PCBs], lead-based paint, radon, drinking water quality, and indoor air quality) was reviewed. Based on DOD guidance on the implementation of CERFA, disclosure factors were not used in categorizing property. These factors are not considered to be hazardous when properly managed and in good condition. Their presence and any required protective actions will be identified and addressed in any lease/deed documentation (i.e., no release into the environment).

Asbestos. An asbestos-containing material (ACM) survey of 130 facilities was conducted at K. I. Sawyer AFB between August and September 1992. This ACM survey included the child care center, youth center, airman's dormitories, and several industrial facilities. An asbestos survey of military family housing at K. I. Sawyer AFB was initiated in July 1994. Additionally, the Bioenvironmental Engineering Office maintains a register of all known ACM in base facilities.

Polychlorinated Biphenyls (PCBs). All PCB oil-containing equipment at K. I. Sawyer AFB has been removed or retrofilled below 50 parts per million PCBs.

Lead-Based Paint. Facilities constructed prior to the implementation of the DOD ban on the use of lead-based paint in 1978 are likely to contain such paint. A partial lead-based paint survey was conducted in 1991 for 33 military family housing units. Only partial remediation occurred following the survey. An on-going lead-based paint survey of military family housing was initiated in July 1994 and is scheduled for completion in September 1994. All military family housing units and 1,026 other facilities were constructed prior to or during 1978.

Radon. A radon screening survey was conducted at K. I. Sawyer AFB in May 1988 in accordance with the Air Force Radon Assessment and Mitigation Program. Thirty-four samples were taken from military family housing units, billeting, airman's dormitories, and the child care center. All survey results were below the U.S. EPA recommended action level of 4.0 picocuries per liter.

Drinking Water Quality. Recent water quality data from published sources indicate that water from the glacial deposits is good to satisfactory for K. I. Sawyer AFB.

Indoor Air Quality. There are no current or past indoor air quality issues at K. I. Sawyer AFB.

S.2.3 Off-Base Property Findings

A total of 36 properties contiguous to or in the vicinity of the base boundary were evaluated in the off-base land use analysis. Based on the records search and site inspections of the properties conducted for this EBS, there were two properties where potential contamination was noted. One area, on the northeast side of the base, had four partially full 55-gallon drums (contents unknown) that were located adjacent to a dirt road in a natural drainage ravine. Two of these drums were noted to be leaking an oily substance onto the soil. A second area of potential contamination, located on the southwest side of the base, is a train line wheel lubricating device that has heavily discolored the gravel ballast. Off-base property where potential contamination exists because of the groundwater contamination plume or adjacent to IRP sites is being investigated under the IRP.

S.3 REQUIRED INVESTIGATIONS AND DATA GAPS

The EBS identifies required investigations or data gaps that need to be resolved. The plan for resolving these data gaps will be incorporated into the BRAC Cleanup Plan. Data gaps identified to date are listed below.

- Areas of soil staining and/or stressed vegetation noted during visual site inspections have not been investigated.
- A lead-based paint survey was initiated in July 1994. A full survey of 177 military family housing units and a visual survey of all other military family housing is scheduled for completion in September 1994.
- A partial asbestos survey consisting of 130 facilities has been conducted on-base. An asbestos survey of the military family housing was initiated in July 1994.
- IRP site investigations are on-going.
- SWMUs/AOCs to be investigated.
- UST removals and proper site closure.
- Closure of hydrant fueling system.

Executive Summary

0.1 Purpose and Scope

This document presents the findings of CH2M HILL's remedial investigation (RI) of seven Installation Restoration Program (IRP) sites at K.I. Sawyer Air Force Base (AFB). The seven IRP sites are Fire Training Areas 1 and 2, Drainage Pond 3, Bulk Fuel Storage Area, Building 436 UST, Building 824 UST, and Building 1247 UST. This document is part of CH2M HILL's Contract No. DACA45-93-C-0047 with the U.S. Army Corps of Engineers (USACE), Omaha District.

The IRP, which was implemented at K.I. Sawyer AFB in 1985, is governed by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) irrespective of whether the sites are on the National Priorities List (NPL). The project was conducted in general conformance with requirements of CERCLA and the IRP.

0.2 Nature and Extent of Contamination and Baseline Risk Assessment

The following discussion summarizes the nature and extent of contamination defined at the seven IRP sites investigated under this contract and the risk to human health and the environment associated with them. The risks posed by soil were evaluated for current and future occupational settings (adult), a future residential setting for groundwater (adult), and current and future recreational exposure to surface water and sediments (child and adult). Pathways include ingestion, inhalation, and dermal absorption.

0.2.1 Fire Training Area 1 (FT-06)

FT-06 was activated in 1958 and was used until 1972. It is unused today. Organic contamination of soil is generally confined to the FT-06 area and appears to be limited to the upper 60 feet of unsaturated soils. Most of the contamination encountered is BTEXs, PCE, and TCE.

Groundwater is contaminated primarily with TCE and PCE below and downgradient of FT-06. Other VOCs present at concentrations that exceed Michigan Act 307 Type B criteria include benzene and 1,2-DCE. The eastward downgradient extent of the groundwater contaminant plume, the vertical distribution of contaminants, and the northern extent of the plume are unknown. Organic contaminants in groundwater have

migrated at least 700 feet east-northeast of FT-06 and may have migrated much further. Groundwater probably discharges to Big Creek, about 2,500 feet east of the site. It is not known whether organic contaminants have migrated to Big Creek.

No risks are identified at FT-06 because the site is in a restricted area. The risks for future exposure to contaminated soils were calculated for an adult in an occupational setting. The risks for groundwater exposure were calculated for an adult in a residential setting. Surface water risks are based on predicted surface water concentrations for recreational exposure.

The carcinogenic risk posed by soil at the FT-06 site is elevated for the surface and subsurface soils in the source area and the subsurface soil of the nonsource area, with cancer risks of 2×10^{-5} . The surface soil of the nonsource area presents a risk less than 1×10^{-6} . The carcinogenic risk for groundwater is if 2×10^{-5} . The noncarcinogenic risk assessment shows a noncarcinogenic hazard index less than 1.0 for all media investigated, so adverse noncarcinogenic effects are unlikely. For Big Creek surface water (using predicted concentrations based on transport modeling), all carcinogenic risks are well below 1×10^{-6} . Impacts on terrestrial species are not expected, and based on modeling results impacts on aquatic species are not expected.

0.2.2 Fire Training Area 2 (FT-07)

FT-07 was used from the early 1970s to 1990. It is no longer in use. Organic soil contamination is generally confined to the former FT-07 area and the leach field of the former oil/water separator. In both areas the contamination is generally limited to the upper 15 feet. Most of the contamination is the BTEXs, naphthalene, and 2-methylnaphthalene.

Groundwater is contaminated primarily with benzene and TCE below and downgradient of FT-07. The eastward downgradient extent of the groundwater TCE plume is unknown, although concentrations are only marginally above Michigan Act 307 Type B criteria. In addition, the southern extent of the groundwater contaminant plume is uncertain. Several SVOCs exceeded Michigan Act 307 Type B criteria at isolated locations, but no SVOC plumes are evident.

No current risks were identified at FT-07, because the site is in a restricted area. The risks for soil exposures were calculated for an adult in an occupational setting. The risks for groundwater exposure were calculated for an adult in a residential setting. Surface water risks are based on predicted surface water concentrations for recreational exposure.

The carcinogenic risk posed by soil at FT-07 is less than 1×10^{-6} for surface and subsurface soils in both source and nonsource areas. The carcinogenic risk for

groundwater is 3×10^{-4} , representing an increased cancer threat. For the surface water of Big Creek (using predicted concentrations based on transport modeling), all carcinogenic risks are well below 1×10^{-6} . The noncarcinogenic risk assessment for soil shows a hazard index less than 1.0 for surface and subsurface soils for both source and nonsource areas. The noncarcinogenic risk assessment for groundwater shows a hazard index of 4.2 for ingestion and inhalation of groundwater contaminants, representing increased risk. For Big Creek surface water (using predicted concentrations based on transport modeling), noncarcinogenic health risks are highly unlikely. Impacts on terrestrial species are not expected, and based on modeling results impacts on aquatic species are not expected.

0.2.3 Drainage Pond 3 (DP-03)

Drainage Pond 3 received waste streams from Building 740. It is no longer used. Organic soil contamination at DP-03 did not exceed Michigan Act 307 Type B criteria. Several inorganic contaminants were found in surficial soils at concentrations generally within two times their background concentrations.

Several VOCs were detected in groundwater upgradient and downgradient of DP-03 at concentrations below Michigan Act 307 Type B criteria. No groundwater contaminant plumes were identified based on the RI data.

Current risks are limited to occupational exposure to surface soil. Future risks for soil exposure were also calculated for an adult in an occupational setting. The risks for groundwater exposure were calculated for an adult in a residential setting.

The carcinogenic risk posed by the DP-03 site both now and in the future is less than 1×10^{-6} for soil and groundwater under their respective exposure settings. Thus increased cancer risk is unlikely at the site. The noncarcinogenic risk assessment shows a noncarcinogenic hazard index less than 1.0 for soil and groundwater under their respective exposure settings, so adverse noncarcinogenic effects are also unlikely.

0.2.4 Bulk Fuel Storage Area (ST-04)

ST-04 is the current storage area for JP-4. Leak testing of the fuel hydrant system did not show areas of leakage from the fuel transfer pipelines or storage tanks. In general, the RI revealed that organic contaminant concentrations were greatest between 10 and 60 feet below ground. The predominant contaminants are toluene, ethylbenzene, and xylene.

A large groundwater BTEX plume is present between the site and Silver Lead Creek. Within the plume is a large area in which floating fuel was previously identified. Based on groundwater water level measurements and surface water sample results, it appears that contaminated groundwater is discharging to Silver Lead Creek. Benzene was present at concentrations below Michigan Act 307 Type B GSI criteria in several surface water samples from Silver Lead Creek.

No current risks were identified at ST-04 because the site is in a restricted area. Future risks for soil exposure were calculated for an adult in an occupational setting. The risks for groundwater exposure were calculated for an adult in a residential setting. Surface water and sediment risks are based on recreational exposure.

The carcinogenic risk posed by soil at ST-04 is less than 1×10^{-6} for surface and subsurface soils, so elevated cancer risks from exposure to soil is unlikely. The carcinogenic risk posed by groundwater is 1×10^{-3} . For Silver Lead Creek surface water, all carcinogenic risks are well below 1×10^{-6} . The noncarcinogenic risk assessment for soil shows a hazard index less than 1.0, so adverse noncarcinogenic health effects are unlikely. The hazard index of 1.5 associated with groundwater under a residential exposure setting indicates increased potential risk.

0.2.5 Building 436 (ST-21)

Building 436 has been demolished and only a concrete slab and the undeveloped manholes, a water separator, lift station and valve pit are present. The site is currently unused.

Two of the five "tanks" at ST-21 had a thin oily layer on the surface of the water contained in them. Samples taken of tank water had only very low ($\mu\text{g/L}$) concentrations of VOCs. SVOCs, although higher in concentration, were generally below Michigan Act 307 Type B criteria.

OVA analysis of soil gas did not show detectable organic vapors. Soil organic contamination does not exceed Michigan Act 307 Type B criteria. Lead is not present above background.

Site-related groundwater contamination was not found. BEHP is potentially present in groundwater but in greater concentrations upgradient of the site.

The risk posed by exposure to contaminated soil both now and in the future was calculated for an adult in an occupational setting. The risk associated with exposure to contaminated groundwater was calculated for an adult in a residential setting.

The carcinogenic risk posed by soil at ST-21 is less than 1×10^{-6} for soil and groundwater under their respective exposure settings, so elevated cancer risk is unlikely. The noncarcinogenic risk assessment shows a noncarcinogenic hazard index less than 1.0 for soil and groundwater under their respective exposure settings, so adverse noncarcinogenic effects are also unlikely.

0.2.6 Building 824 (ST-22)

The original leaking UST at ST-22 was removed along with 40 cubic yards of contaminated soil during the Basewide tank removal program. The building is currently an auto repair shop.

Soil VOC contamination at ST-22 was not found above Michigan Act 307 Type B criteria. Lead was not present above background. Site-related groundwater contamination was not found.

No current risk is associated with soil at ST-22 because the soils are capped by concrete or asphalt. The future risk associated with exposure to contaminated soil was calculated for an adult in an occupational setting. The risk associated with exposure to contaminated groundwater was calculated for an adult in a residential setting.

The carcinogenic risk posed by soil at ST-22 is less than 1×10^{-6} for soil and groundwater under their respective exposure settings, so elevated cancer risks are unlikely. The noncarcinogenic risk assessment shows a hazard index less than 1.0 for soil and groundwater under their respective exposure settings, so adverse noncarcinogenic health effects are also unlikely.

0.2.7 Building 1247 (ST-20)

Four USTs and 1,043 cubic yards of contaminated soil was removed from ST-20. The building is currently an active gasoline service station. The results of the soil gas analysis performed on samples from ST-20 show elevated organic vapor readings in the area of the former underground storage tanks and near the pipelines from the tanks to the gas pumps. Toluene, ethylbenzene, and xylene were detected at concentrations above Michigan Act 307 Type B criteria in soils from 20 to 40 feet below grade in the former UST area. Lead was not present above background in soil.

Site-related groundwater contamination is limited to 1,2-DCA at a concentration below the Michigan Act 307 Type B criteria. Toluene and chloroform were also detected at concentrations below than Michigan Act 307 Type B criteria but at upgradient and downgradient monitoring wells.

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No risk is associated with exposure to the soils at ST-20 because the soils are capped by concrete or asphalt. The future risk posed by exposure to contaminated soil was calculated for an adult in an occupational setting. The risk associated with exposure to contaminated groundwater was calculated for an adult in a residential setting.

The carcinogenic risk posed by soil at ST-20 is less than 1×10^{-6} for both soil and groundwater under their respective exposure settings, so increased cancer risk is unlikely at the site. The noncarcinogenic risk assessment shows a hazard index less than 1.0 for soil and groundwater under their respective exposure settings, so adverse noncarcinogenic health effects are unlikely at the site.

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