

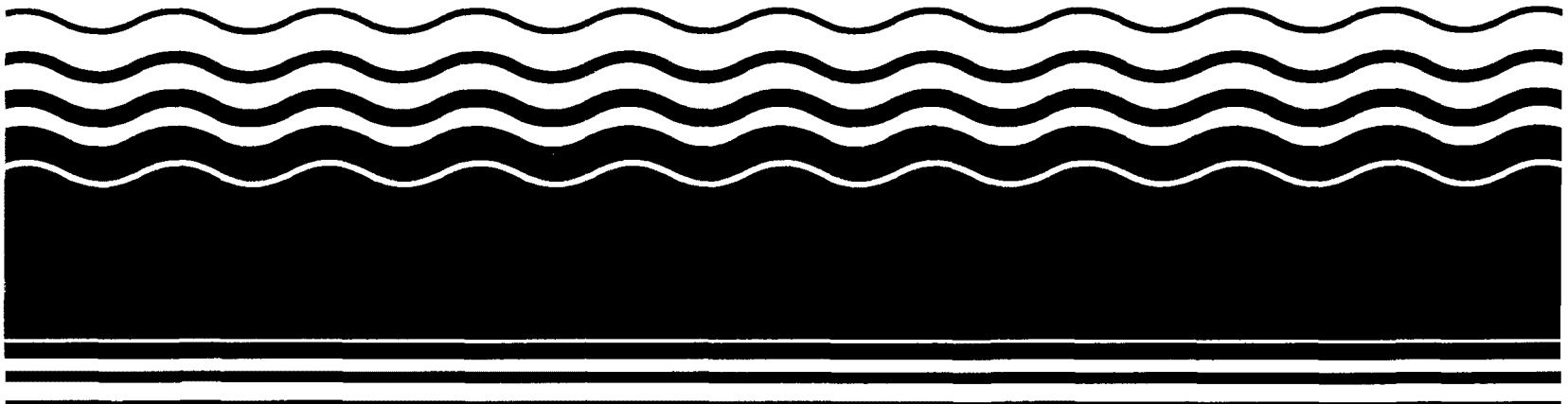
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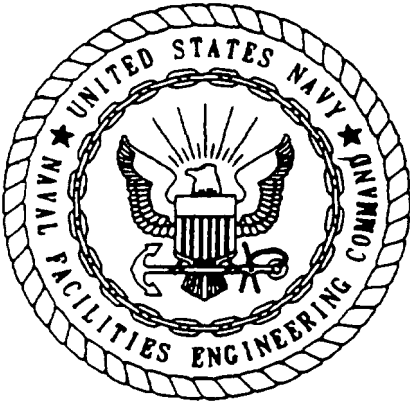
**EPA 541-R98-056**

**October 1998**

**EPA Superfund  
Record of Decision:**

**Cecil Field Naval Air Station OU 5  
Jacksonville, FL  
8/4/1998**



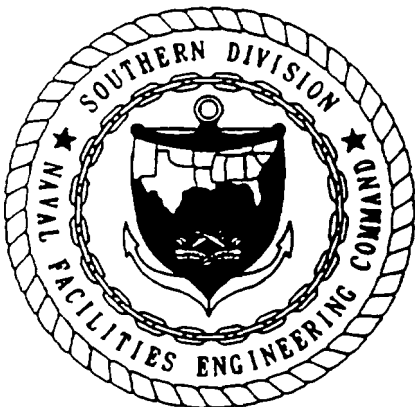


**RECORD OF DECISION  
SITE 14, OPERABLE UNIT 5**

**NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

**UNIT IDENTIFICATION CODE: N60200  
CONTRACT NO.: N62467-89-D-0317/090**

**JULY 1998**



**SOUTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORTH CHARLESTON, SOUTH CAROLINA  
29418**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 4

ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW  
ATLANTA, GEORGIA 30303-8909

**SEP 2 9 1998**

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

4WD-FFB

Commanding Officer  
Attn.: David Porter  
Base Environmental Coordinator  
DON, Southern Division  
Naval Facilities Engineering Command  
Mail Code 18B2  
P.O. Box 190010  
North Charleston,  
South Carolina 29419-9010

Subject: Naval Air Station Cecil Field, Jacksonville, Florida  
Record of Decision for Operable Unit 5, site 14

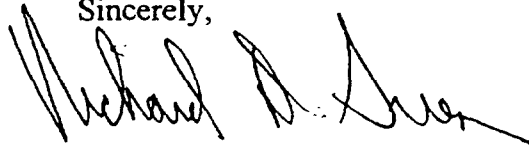
Dear Mr. Porter:

The Environmental Protection Agency (EPA) has received and reviewed the final Record of Decision (ROD) for Operable Unit 5 (OU 5), site 14. EPA concurs with the Navy's decision as set forth in the ROD dated July 1998. This concurrence is contingent with the understanding that the selection of no further remedial action at this site is protective of human health and the environment. Should new information indicate otherwise, the Navy is liable for any future actions as required.

NAS Cecil Field was listed on the National Priorities List as Cecil Field Naval Air Station in 1989. Prior to NPL listing and designation for closure, the Installation and Restoration Program identified 18 sites as needing further investigation. These 18 sites were grouped by usage and waste type to form eight operable units. OU 5 consists of sites 14 and 15, which were both used for ordnance demolition. This Record of Decision addresses only site 14. Site 14 is located in an area designated for forestry management and recreation per the NAS Cecil Field Final Reuse Plan, dated February 1996. Development of groundwater resources and construction of buildings at this location is not anticipated. The Remedial Investigation and Risk Assessment for OU 5, site 14 identified no unacceptable risks for any media, therefore no further action is being recommended at this time. However, any new information contradicting this finding may require further investigation or remedial actions.

EPA appreciates the coordination efforts of NAS Cecil Field and the level of effort that was put forth in the documents leading to this decision. EPA looks forward to continuing the excellent working relationship with NAS Cecil Field and Southern Division Naval Facilities Engineering Command as we move toward final cleanup of the NPL site. Should you have any questions, or if EPA can be of any further assistance, please contact Ms. Deborah Vaughn-Wright, of my staff, at the letterhead address or at (404) 562-8539.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard D. Green", written over a horizontal line.

Richard D. Green  
Director  
Waste Management Division

cc: Mr. James Crane, FL DEP  
Mr. Eric Nuzie, FL DEP  
Mr. Michael Deliz, FL DEP  
Mr. Mark Davidson, SOUTHDIV

## 1.0 DECLARATION FOR THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION. Site 14, Blue 5 Ordnance Disposal Area, is part of Operable Unit (OU) 5 and is located in the north-central part of the Yellow Water Weapons Area (YWWA) of Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The site covers an area of approximately 19 acres.

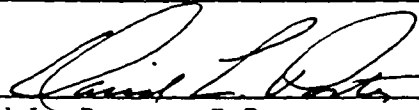
1.2 STATEMENT OF BASIS AND PURPOSE. This Record of Decision (ROD) document presents the selected remedial action for Site 14 (OU 5), which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations, Part 300 [U.S. Environmental Protection Agency (USEPA), 1990]). This decision is based on the Administrative Record for OU 5.

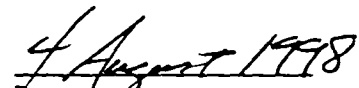
The USEPA and the State of Florida concur with the selected remedy.

1.3 DESCRIPTION OF THE SELECTED REMEDY. This ROD is the final action for Site 14 and is based on the results of the Remedial Investigation (RI) and Baseline Risk Assessment (BRA) completed for OU 5. The selected remedy for Site 14 is No Further Action. This remedy does not require any specific administrative on-site actions, monitoring, or 5-year reviews to ensure there are no unacceptable exposures to potential hazards posed by conditions at the site. This remedy is consistent with the BRA conducted for conditions observed at the site. The assessment concluded that there is no imminent threat to human health or the environment.

1.4 STATUTORY DETERMINATIONS. The selected remedies are protective of human health and the environment and are cost-effective. Although contaminants, pathways, and receptors were identified to be present at Site 14, the risks calculated for current or potential human and ecological receptors being exposed to the soil and groundwater did not exceed the USEPA acceptable risk criteria. According to USEPA guidance, if no risk to human health or the environment is identified, no further remedial action (including setting remedial action objectives and conducting an engineering feasibility study [FS] to evaluate remedial alternatives) is warranted at the site to ensure protection of human health and the environment.

### 1.5 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.

  
\_\_\_\_\_  
David L. Porter, P.E.  
Base Realignment and Closure  
Environmental Coordinator

  
\_\_\_\_\_  
Date

**RECORD OF DECISION  
SITE 14, OPERABLE UNIT 5**

**NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

**Unit Identification Code: N60200**

**Contract No. N62467-89-D-0317/090**

**Prepared by:**

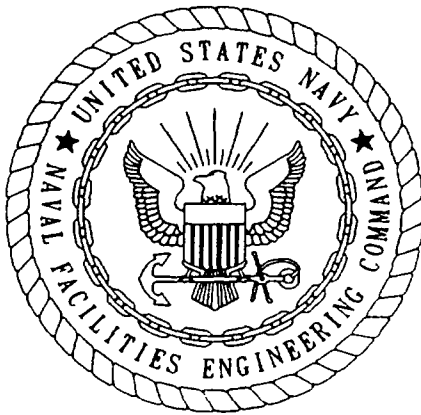
**Harding Lawson Associates  
2590 Executive Center Circle, East  
Tallahassee, Florida 32301**

**Prepared for:**

**Department of the Navy, Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29418**

**Mark Davidson, Code 1879, Engineer-in-Charge**

**July 1998**



CERTIFICATION OF TECHNICAL  
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates (formerly ABB Environmental Services, Inc.), hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/090 are complete and accurate and comply with all requirements of this contract.

DATE: July 15, 1998

NAME AND TITLE OF CERTIFYING OFFICIAL: Rao Angara  
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Eric Blomberg, P.G.  
Project Technical Lead

(DFAR 252.227-7036)

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Naval Air Station Cecil Field  
Jacksonville, Florida

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## GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BEHP	bis(2-ethylhexyl)phthalate
bls	below land surface
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ELCR	excess lifetime cancer risk
ERA	ecological risk assessment
FDEP	Florida Department of Environmental Protection
FS	feasibility study
FSWS	Florida Class III surface water standards
ft/day	feet per day
ft/ft	feet per foot
K	hydraulic conductivity
µg/l	micrograms per liter
NAS	Naval Air Station
NPL	National Priority List
OU	operable unit
RAB	Restoration Advisory Board
RI	remedial investigation
ROD	Record of Decision
SQAG	sediment quality assessment guideline
SVOC	semivolatile organic compound
TNB	trinitrobenzene
TNT	trinitrotoluene
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	volatile organic compound
YWWA	Yellow Weapons Water Area

## 1.0 DECLARATION FOR THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION. Site 14, Blue 5 Ordnance Disposal Area, is part of Operable Unit (OU) 5 and is located in the north-central part of the Yellow Water Weapons Area (YWWA) of Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The site covers an area of approximately 19 acres.

1.2 STATEMENT OF BASIS AND PURPOSE. This Record of Decision (ROD) document presents the selected remedial action for Site 14 (OU 5), which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations, Part 300 [U.S. Environmental Protection Agency (USEPA), 1990]). This decision is based on the Administrative Record for OU 5.

The USEPA and the State of Florida concur with the selected remedy.

1.3 DESCRIPTION OF THE SELECTED REMEDY. This ROD is the final action for Site 14 and is based on the results of the Remedial Investigation (RI) and Baseline Risk Assessment (BRA) completed for OU 5. The selected remedy for Site 14 is No Further Action. This remedy does not require any specific administrative on-site actions, monitoring, or 5-year reviews to ensure there are no unacceptable exposures to potential hazards posed by conditions at the site. This remedy is consistent with the BRA conducted for conditions observed at the site. The assessment concluded that there is no imminent threat to human health or the environment.

1.4 STATUTORY DETERMINATIONS. The selected remedies are protective of human health and the environment and are cost-effective. Although contaminants, pathways, and receptors were identified to be present at Site 14, the risks calculated for current or potential human and ecological receptors being exposed to the soil and groundwater did not exceed the USEPA acceptable risk criteria. According to USEPA guidance, if no risk to human health or the environment is identified, no further remedial action (including setting remedial action objectives and conducting an engineering feasibility study [FS] to evaluate remedial alternatives) is warranted at the site to ensure protection of human health and the environment.

1.5 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.

---

David L. Porter, P.E.  
Base Realignment and Closure  
Environmental Coordinator

---

Date

## 2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION. NAS Cecil Field is located 14 miles southwest of Jacksonville, Florida. The majority of Cecil Field is located within Duval County; the southernmost part of the facility is located in northern Clay County (Figure 2-1).

The area surrounding NAS Cecil Field is used primarily for forestry with some light agriculture and ranching. Small communities and scattered dwellings are in the vicinity of NAS Cecil Field; the closest abuts the western edge of the facility. The closest incorporated municipality, Baldwin, is approximately 6.4 miles northwest of the main facility entrance.

To the east of NAS Cecil Field, the rural surroundings grade into a suburban fringe bordering the major east-west roadways. Low commercial use, such as convenience stores, and low density residential areas characterize the land use (ABB Environmental Services, Inc. [ABB-ES], 1992 [currently Harding Lawson Associates]). A development called Villages of Argyle, when complete, is planned to consist of seven separate villages or communities that will ultimately abut NAS Cecil Field to the south and southeast. A golf course and residential area also border NAS Cecil Field to the east (Southern Division, Naval Facilities Engineering Command, 1989).

NAS Cecil Field was established in 1941 and provides facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. Some of the tasks required to accomplish this mission over past years included operation of fuel storage facilities, performance of aircraft maintenance, maintenance and operation of engine repair facilities and test cells for turbo-jet engines, and support of special weapons systems.

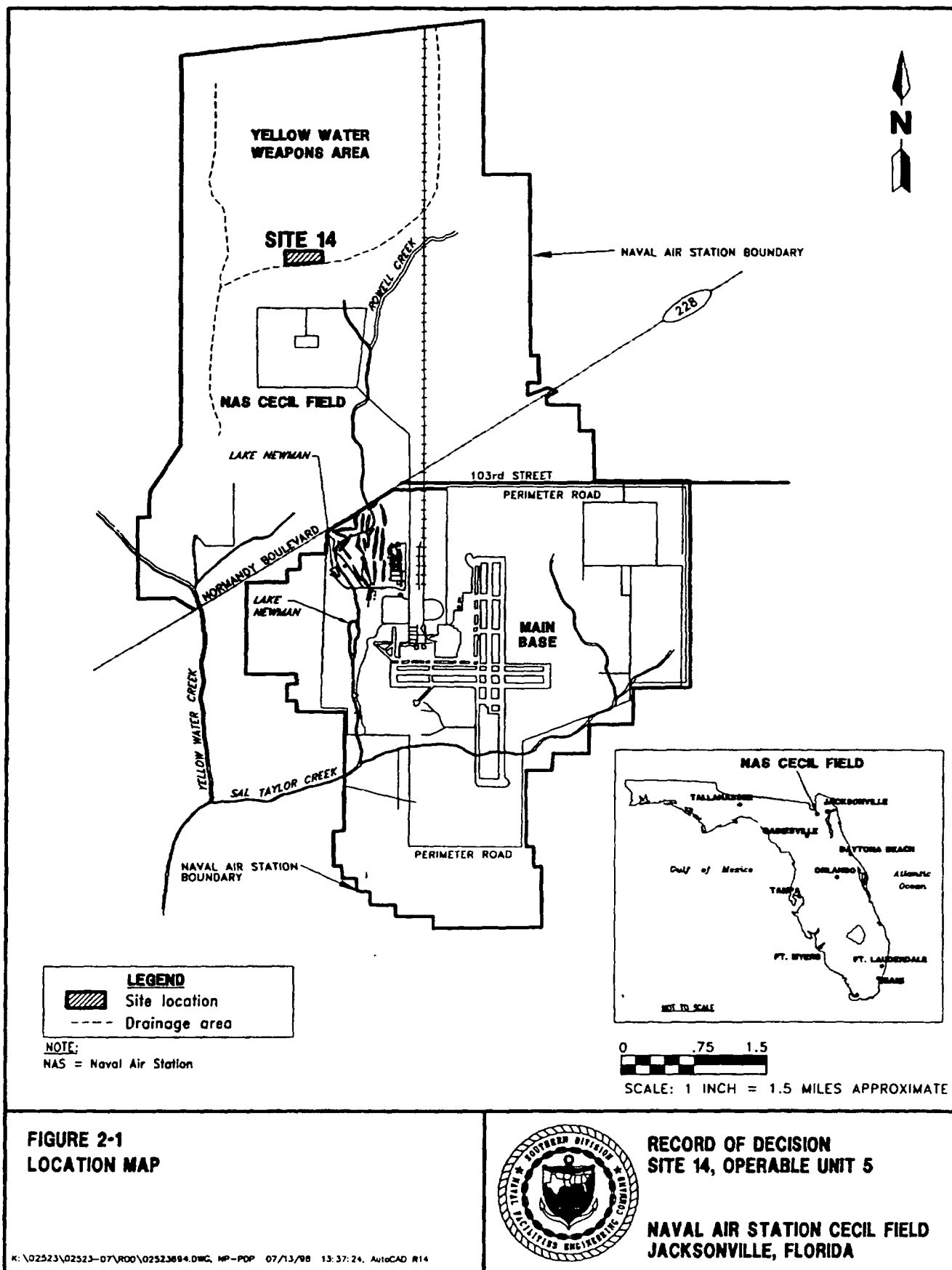
Site 14, which is part of OU 5, is located in the north-central portion of the YWWA and covers an area of approximately 19 acres (Figure 2-2). OU 5 is composed of Site 14 and Site 15 (Blue 10 Ordnance Disposal Area).

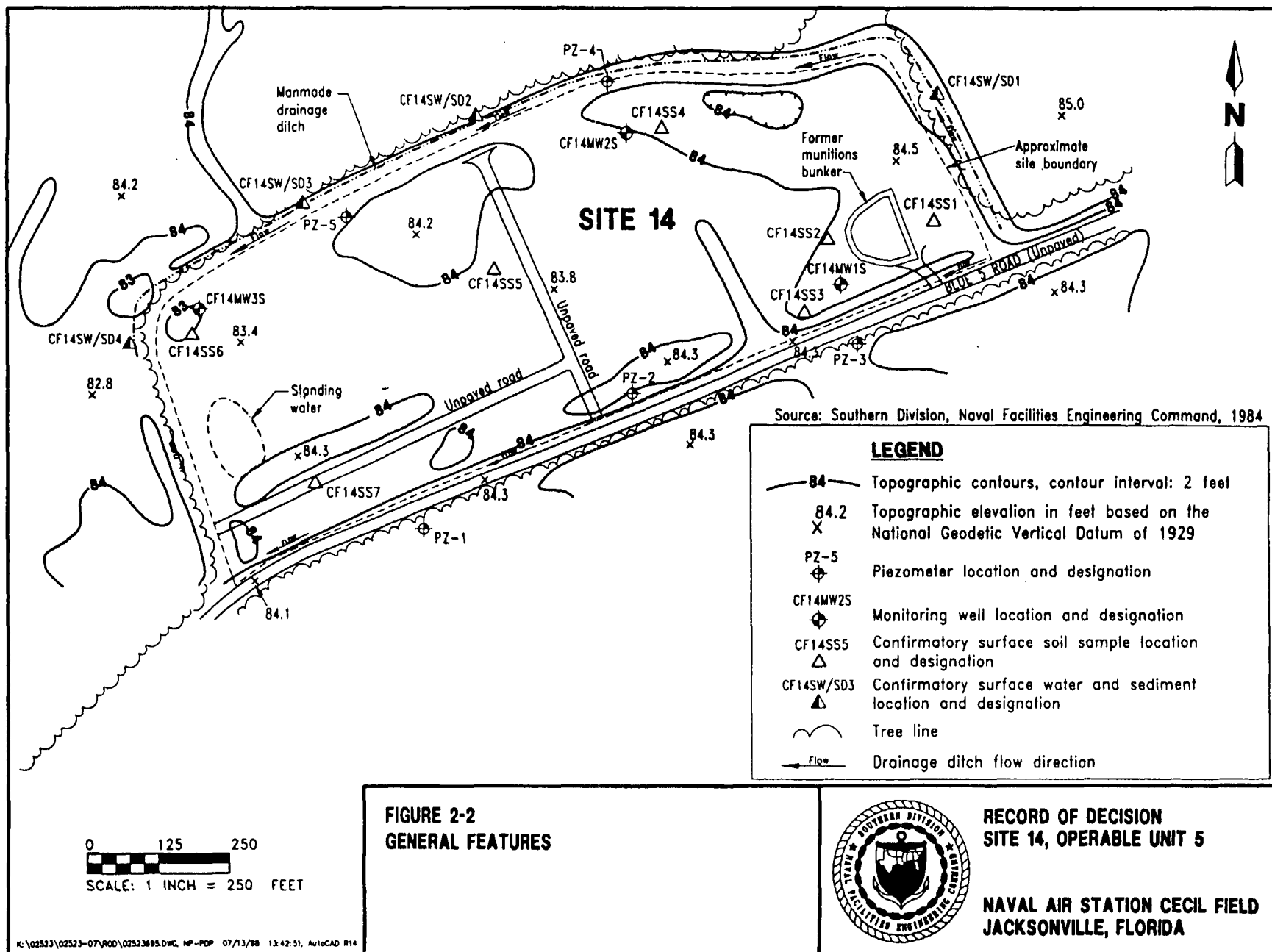
The site was used as an ordnance disposal area from 1967 through 1977. Disposal operations at this site consisted of detonation, which occurred approximately once every 6 weeks. An ammunition bunker, located in the southeastern corner of the site, was used for the temporary storage of materials to be detonated.

The types of ordnance disposed of included fuses, 100-pound bombs, large munitions, and explosive materials that normally do not burn. Based on interviews with explosive ordnance disposal personnel, typical explosives detonated included trinitrotoluene (TNT), trinitrophenylmethylnitramine, and cyclotrimethylenetrinitramine.

On the average, 300 to 450 pounds of explosive material were detonated each time. Over the time period in which the site was utilized, it is estimated that 30,000 to 45,000 pounds of explosive material were detonated at the site.

There are no well-defined surface drainage patterns at Site 14. A small ditch, which contained standing water during the on-site survey, borders portions of the





site on the southwest and northeast. Drainage probably ponds in the ditches on site, with any off-site drainage entering scattered swampy areas near the site.

The site is predominantly a moist, open, grassy area, which through natural succession is gradually developing a growth of pines. A dirt road borders the site on the south. Planted pines occur along the eastern and northwestern periphery of the site. The remainder of the surrounding area is a pine forest with pockets of swamp forest in the low areas. There were no indications of biological stress observed at the site (Envirodyne Engineers, 1985).

Site 14 is currently not used on a regular basis. During the base closure process, if unexploded ordnance is located, it has been detonated at Site 14 in recent years. Ordnance are placed in an explosives-lined hole and covered with additional explosives and detonated. This technique of surrounding the ordnance with explosives ensures destruction of the ordnance. The future use of Site 14, as identified in the Base Reuse Plan, will be part of a managed forest.

**2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES.** NAS Cecil Field was placed on the National Priority List (NPL) by the USEPA and the Office of Management and Budget in December 1989. A Federal Facility Agreement for NAS Cecil Field was signed by the Florida Department of Environmental Protection (FDEP), the USEPA, and the Navy in 1990. Following the listing of NAS Cecil Field on the NPL and the signing of the site management plan, remedial response activities at the facility were conducted under CERCLA authority.

As stated in Section 2.1 of this ROD, Site 14 was used for ordnance detonation activities from 1967 through 1977. Environmental investigations of Site 14 began in 1985. The following reports describe the results of investigations at Site 14 to date:

- *Initial Assessment Study, NAS Cecil Field, Jacksonville, Florida* (Envirodyne Engineers, 1985)
- *RCRA Facility Investigation, NAS Cecil Field, Jacksonville, Florida* (Harding Lawson Associates, 1988)
- *Remedial Investigation, Operable Unit 5, Sites 14 and 15, Naval Air Station Cecil field, Jacksonville, Florida* (ABB-ES, 1997a)
- *Feasibility Study, Operable Unit 5, Naval Air Station Cecil Field, Jacksonville, Florida* (ABB-ES, 1997b)
- *Proposed Plan for Remedial Action, Naval Air Station Cecil Field, Site 14, Blue Ordnance Disposal Area, Operable Unit 5* (ABB-ES, 1998)

**2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION.** The results of the RI and the BRA were presented to the NAS Cecil Field Restoration Advisory Board (RAB) (composed of community members as well as of representatives from the Navy, and State and Federal regulatory agencies).

The public was invited to an RAB meeting on February 17, 1998, for a briefing on the results of the RI, the BRA, and the proposed plan, and to solicit comments

on Site 14 from the community. A 30-day comment period was held from May 1 through May 31, 1998. One comment was received during the public comment period and is presented in the responsiveness summary in the attachment.

Public notices of the availability of the Proposed Plan were placed in the Metro section of the *Florida Times Union* on May 5, 1998. The Proposed Plan and other documents are available to the public at the Information Repository, Charles D. Webb Wesconnett Branch of the Jacksonville Library, 6887 103rd Street, Jacksonville, Florida.

**2.4 SCOPE AND ROLE OF OPERABLE UNIT.** As with many Superfund sites, environmental concerns at NAS Cecil Field are complex. As a result, work has been organized into eight installation restoration OUs, along with more than 100 other areas undergoing evaluation under the Base Realignment and Closure Program and the State of Florida Petroleum Program.

Final RODs have been approved for OUs 1, 2, 3, 4, and 7. Final RIs, BRAs, and FSs have been completed for OUs 5, 6, and 8. Interim RODs that addressed the source areas of contamination were approved for OUs 2, 6, and 7. The other OUs are in various stages of the RI/FS process.

Investigations at Site 14, the subject of this ROD, indicated the presence of semivolatile organic compounds (SVOCs), total recoverable petroleum hydrocarbons (TRPH), a pesticide, and inorganics in soil. In groundwater, one volatile organic compound (VOC), a SVOC, and inorganics were detected. Surface water contamination included VOCs, a pesticide, and inorganics. Sediment contamination included SVOCs, TRPH, and inorganics. Many contaminants were detected in only one sample, and most had concentrations below screening criteria. It should be noted, as well, that the surface water was resampled and analyzed. Neither the inorganics nor some of the SVOCs were detected in this second sampling of surface water.

## **2.5 SUMMARY OF SITE CHARACTERISTICS.**

**Geology.** The subsurface geologic materials recovered during monitoring well installation activities at OU 5 indicate that the sites are underlain by undifferentiated, fine-grained sand. Lenses and stringers of silty or clayey material were encountered intermittently. The stringers are generally less than 1 inch thick and are not continuous. Lithologic descriptions recorded during monitoring well installation indicate that sand is present at each of the monitoring well locations from land surface to total depth. Cross sections are not presented because the maximum total monitoring well depth was 13 feet below land surface (bls) and sand was the sole lithology described throughout that interval in all monitoring well lithologic logs.

The lithologic log recorded during installation of the background monitoring well CEFBK12DD, located approximately 4,000 feet west of Site 14, indicates that Holocene and Pliocene sand is present from land surface to a depth of 66 feet bls. Pliocene to Miocene sandy clay and dolomite are present from 66 feet to 81 feet bls. This unit, the proximate boundary between the surficial and intermediate aquifers, is underlain by a thin layer of dolomite, representative of the uppermost portions of the Miocene Hawthorn Group, from 81 feet to 83 feet



bls. Partially dolomitized sandy silt is present from 83 feet to 129 feet bls, the total depth of the monitoring well.

Hydrogeology. The surficial aquifer at Site 14 is composed predominantly of sand from land surface to an approximate depth of 66 feet bls. The water table is unconfined at Site 14 and may range between 1 and 4 feet bls during the year depending upon rainfall events. The maximum total depth of the 3 monitoring wells installed in the surficial aquifer at Site 14 is approximately 13 feet bls. Sand was reported from land surface to total depth in each of the monitoring well lithologic logs. Each monitoring well was screened across the water table in the upper portion of the surficial aquifer.

Groundwater-level elevation measurements were recorded periodically for piezometers and monitoring wells at Site 14. Review and evaluation of the water-level elevation data collected from five piezometers installed at Site 14 support the interpretation that Site 14 is located in the vicinity of a groundwater divide. As a result, there is no predominant horizontal groundwater flow. Instead, the groundwater flow direction can be radial with strong downward gradient.

Slug tests were conducted on the Site 14 monitoring wells to estimate horizontal hydraulic conductivity (K). K values ranged from 8.8 feet per day (ft/day) to 9.5 ft/day for Site 14 monitoring wells, with an average K value of 9.2 ft/day.

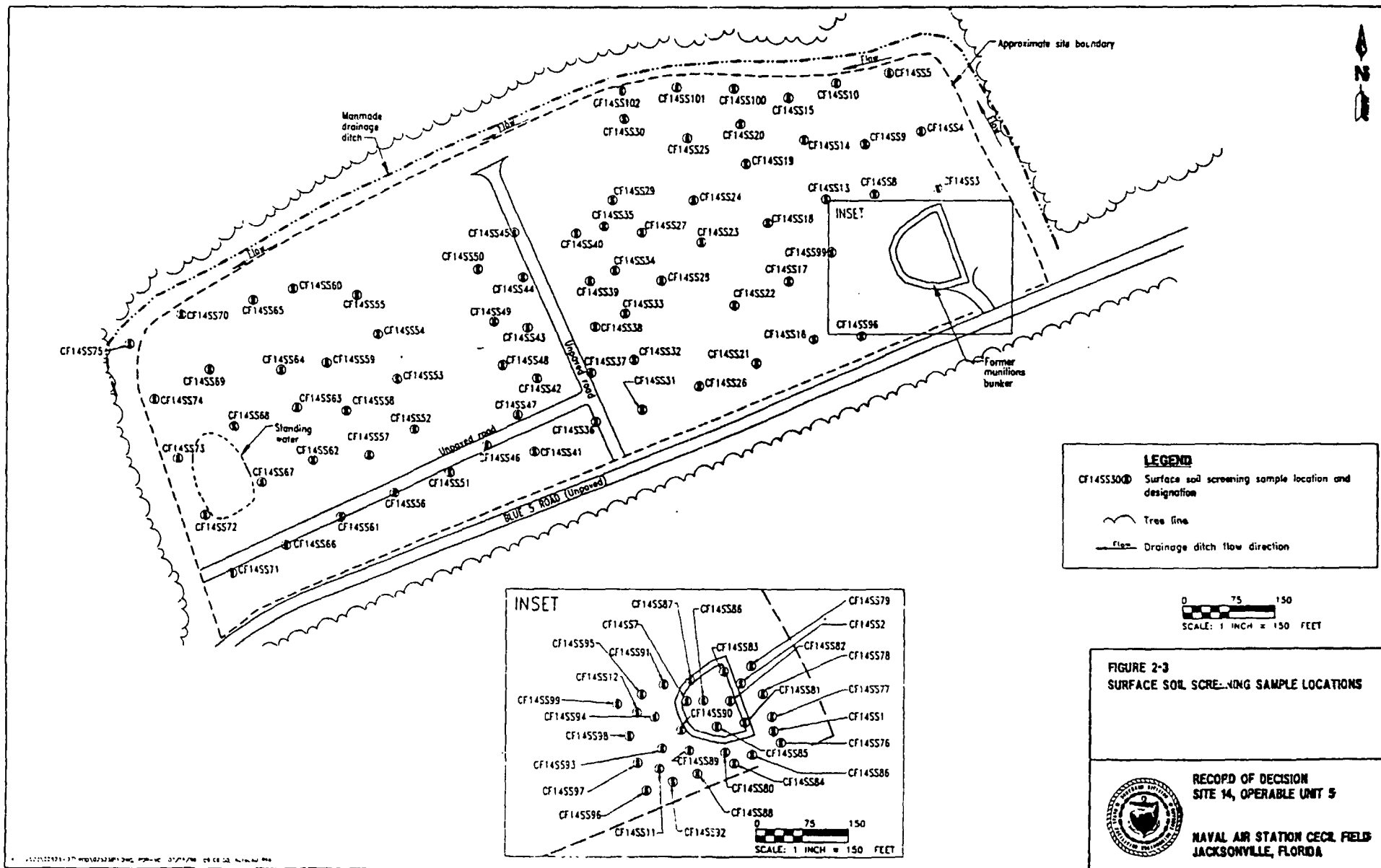
Aquifer performance tests conducted at NAS Cecil Field by the U.S. Geological Survey (USGS) indicate that a K of 3 ft/day is a representative K value for the surficial aquifer (USGS, 1996). Using the estimated value of 3 ft/day for K and an estimated effective porosity of 0.20 (USGS, 1996), a hydraulic gradient of 0.00030 feet per foot (ft/ft) and 0.00064 ft/ft for Site 14, the seepage velocity for Site 14 is estimated to range from 1.6 to 3.5 feet per year.

Contaminant Sources. At Site 14, the primary source of contamination would be from the detonation activities that took place between 1967 and 1977. The types of ordnance disposed included fuses, 100-pound bombs, large munitions, and explosive materials that normally do not burn. Explosives (nitroaromatics) detonated at the site included TNT, trinitrophenylmethylnitramine (tetryl), and cyclotrimethylenenitramine. Ordnance detonation generates residual metals, primarily aluminum and lead oxides and minor amounts of unreacted or partially reacted organics.

Surface Soil. An extensive field screening program for TNT and VOCs was conducted for surface soil at the site. Sample locations are presented in Figure 2-3. TNT was detected in 14 of 102 samples, at concentrations ranging from 1.0 to 2.9 milligrams per kilogram. The results indicate that TNT is sporadically distributed at low concentrations that pose no explosive or biological hazard over the area of investigation. No VOCs were detected in the 24 surface soil samples collected for field screening purposes.

A subsequent confirmatory sampling program conducted for surface soil at Site 14 indicated the presence of three SVOCs (di-n-butylphthalate, butylbenzylphthalate, and bis[2-ethylhexyl]phthalate [BEHP]), a pesticide (endosulfan II), and several inorganic chemicals. However, the concentrations of these chemicals were below the Florida soil cleanup goals for residential areas (Table 2-1).

2-7



**Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida**

[illegible]

**Table 2-1 (Continued)  
Surface Soil Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

- <sup>1</sup> Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
- <sup>2</sup> The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the contract-required quantification limit/contract-required detection limit is used as a surrogate concentration for results reported as nondetect.
- <sup>3</sup> The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R," "U," or "UJ" validation qualifiers.
- <sup>4</sup> The background screening concentrations are from the NAS Cecil Field inorganic background data set.
- <sup>5</sup> For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for residential surface soil exposure per January 1993 guidance (USEPA, 1993) describes the process for screening. Actual values are taken from the USEPA Region III RBC Table dated May 1996 (USEPA, 1996a), which are based on an excess lifetime cancer risk of  $10^{-6}$  and an adjusted hazard quotient of 0.1. For the essential nutrients, screening values were derived based on recommended daily allowances (see Appendix B-1 of the General Information Report [ABB-ES, 1996]).
- <sup>6</sup> Values are from Florida Department of Environmental Protection's (FDEP's) memoranda titled, "Soil Cleanup Goals for Florida" dated September 29, 1995 (FDEP, 1995), and "Applicability of Soil Cleanup Goals for Florida" dated January 19, 1996 (FDEP, 1996). Note that they are also residential values.
- <sup>7</sup> Analyte was included or excluded from the risk assessment for the following reasons:
- B = the maximum detected concentration did not exceed twice the arithmetic mean of detected concentrations at background locations and will not be considered further.
  - S = the maximum detected concentration did not exceed the risk-based screening concentration and will not be considered further.
  - G = the maximum detected concentration did not exceed the Florida guidance concentration and will not be considered further.
- <sup>8</sup> The value is based on a mixture of endosulfan isomers.
- <sup>9</sup> The value is based on hexavalent chromium.
- <sup>10</sup> The value for lead is based on the USEPA Office of Solid Waste and Emergency Response, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994) and assumes residential land use.
- <sup>11</sup> The screening value is from FDEP's "Development of Risk-Based Soil Cleanup Target Levels," Chapter 62-770, Florida Administrative Code, February 1997 (FDEP, 1997).

Notes: The average of a sample and its duplicate is used for all table calculations.

Sample locations: CF14SS1, CF14SS2, CF14SS3, CF14SS4, CF14SS5, CF14SS6, CF14SS7.

Duplicate sample locations: CF14SS1D.

Background sample locations: CFBSS16, CFBSS17, CFBSS18, CFBSS19, CFBSS20, CFBSS21, CFBSS9.

\* = see footnote 2.

HHCP = human health chemical of potential concern.

mg/kg = milligrams per kilogram.

NA = not applicable.

PCB = polychlorinated biphenyl.

ND = not detected in background.

NSC = no screening concentration available.

R = rejected.

U = not detected.

UJ = not detected.

Groundwater. One VOC (toluene), one nitroaromatic (1,3,5-trinitrobenzene [TNB]), and several inorganic chemicals were detected in groundwater samples (Table 2-2). The concentrations of toluene, TNB, and beryllium were below Florida drinking water standards and Florida groundwater guidance concentrations. Thallium was detected in one of three groundwater samples and was not detected in its associated duplicate sample. The concentration of thallium detected in this one sample, 3 micrograms per liter ( $\mu\text{g}/\ell$ ), was slightly higher than its regulatory value of 2  $\mu\text{g}/\ell$ . The concentrations of iron, aluminum, and manganese slightly exceeded the Florida secondary drinking water standards. However, the concentrations of aluminum, beryllium, iron, manganese, and thallium were below the NAS Cecil Field inorganic background concentrations.

Surface Water. One VOC (acetone), one SVOC (BEHP), one pesticide (endrin), and several inorganic compounds were detected in surface water samples from the site (Table 2-3). Acetone was detected in similar concentrations in trip blanks and does not appear to be associated with ordnance disposal activities at the site. BEHP, a common laboratory contaminant, was detected in three out of four samples at a maximum concentration of 43  $\mu\text{g}/\ell$ . Endrin was detected in only one of four samples, at a concentration only slightly exceeding the Florida Class III surface water quality standards (FSWS). Three inorganic chemicals (aluminum, beryllium, and zinc) were detected at concentrations greater than FSWS or other screening criteria. However, aluminum and beryllium were below the NAS Cecil Field inorganic background concentrations.

Sediment. Two VOCs (acetone and 2-butanone), several SVOCs, and several inorganics were detected in sediment samples collected from the drainage ditches surrounding the site (Table 2-4). Only some detections of acenaphthalene and BEHP exceeded the Florida sediment quality assessment guideline (SQAG) threshold effect level, but the concentrations did not exceed the SQAG probable effect level.

2.6 SUMMARY OF SITE RISKS. The BRA provides the basis for taking action and indicates the exposure pathways that need to be addressed by remedial action. It serves as the baseline indicating what risks could exist if no action were taken at the site. This section of the ROD reports the results of the BRA conducted for Site 14. Potential ecological and human health risks were identified for chemicals detected in surface soil, groundwater, and surface water at Site 14. However, for current and future planned usage (as a managed forest), risk levels fall within or below the USEPA acceptable cancer risk range of  $10^{-4}$  to  $10^{-6}$  and below the noncancer hazard index of 1 (with the exception of the adult and child noncancer hazard indices for the ingestion of groundwater). Risk levels for exposure to groundwater (cancer and noncancer risk for future land use) and surface water (cancer risk for current and future land use) exceeded FDEP's acceptable cancer risk of  $10^{-6}$  and noncancer hazard index of 1.

Human Health Risk Assessment (HHRA). The purpose of the HHRA was to characterize the risks associated with the possible exposures to site-related contaminants for human receptors. Potential health risks were evaluated under current and assumed future land-use conditions. Results from the Site 14 HHRA are presented in Table 2-5, Figures 2-4 through 2-8, and summarized below.

Surface Soil. Risks to human health, for all receptors, fall below the USEPA's and FDEP's acceptable risk for both current and future land use.

**Table 2-2**  
**Groundwater Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

Analyte	Frequency of Detection <sup>1</sup>	Range of Reporting Limits	Range of Detected Concentrations(*) <sup>2</sup>	Mean <sup>3</sup>	Background Screening Concentrations <sup>4</sup>	Risk-Based Concentrations <sup>5</sup>	Florida Guidance Concentrations <sup>6</sup>	Analyte HHCP? (Yes/No)	Reason <sup>7</sup>
<b><u>Volatile Organic Compounds (µg/l)</u></b>									
Toluene	1/3	1 to 2	9	9	NA	75	40	No	S,G
<b><u>Explosives (µg/l)</u></b>									
1,3,5-Trinitrobenzene	1/3	0.2 to 0.26	1.6*	1.6	NA	0.18	50	Yes	
<b><u>Inorganic Analytes (µg/l)</u></b>									
Aluminum	2/3	200	578 to 7,230*	3,900	13,102	3,700	200	Yes	
Barium	3/3	200	7.6 to 23.2	16.6	88.2	260	2,000	No	S,G,B
Beryllium	2/3	5	2.1 to 3.35*	2.7	3.5	0.016	4	Yes	
Calcium	3/3	5,000	230 to 3,870	1,890	81,075	1,100,000	NSC	No	S
Chromium	2/3	10	2.1 to 6.9*	4.5	18	*18	*100	No	S,G,B
Cobalt	1/3	50	13.7*	13.7	12.8	220	NSC	No	S
Iron	3/3	100	786 to 4,960	2,850	7,760	1,100	300	Yes	
Magnesium	3/3	5,000	477 to 1,180	820	10,000	119,000	NSC	No	S,B
Manganese	3/3	15	21* to 84.2	51	96	84	50	Yes	
Nickel	1/3	40	11.8*	11.8	25	73	100	No	S,G,B
Potassium	3/3	5,000	252 to 1,510	800	4,330	300,000	NSC	No	S,B
Sodium	3/3	5,000	6,720* to 10,500	8,510	16,500	39,000	160,000	No	S,G
Thallium	1/3	10	5.5*	5.5	13.3	0.29	2	Yes	
Vanadium	2/3	50	2.6 to 9.1	5.9	20.2	26	49	No	S,G,B
Zinc	1/3	20	34.5*	34.5	76.8	1,100	5,000	No	S,G,B
See notes at end of table.									

**Table 2-2 (Continued)  
Groundwater Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

- <sup>1</sup> Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).
- <sup>2</sup> The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, 1/2 the contract-required quantitation limit/contract-required detection limit is used as a surrogate.
- <sup>3</sup> The mean of detected concentration is the arithmetic mean in which the analyte was detected. It does not include those samples with "R," "U," or "UJ" validation qualifiers.
- <sup>4</sup> The background screening concentrations are from the NAS Cecil Field Inorganic background data set.
- <sup>5</sup> For all chemicals except the essential nutrients (calcium, magnesium, potassium, and sodium), the U.S. Environmental Protection Agency (USEPA) Region III Risk-Based Concentration (RBC) table for tap water exposure per January 1993 guidance (USEPA, 1993) describes the process for screening. Actual values are taken from the USEPA Region III RBC Table dated May 1996 (USEPA, 1996a), which are based on an excess lifetime cancer risk of 10<sup>-6</sup> and an adjusted hazard quotient of 0.1. For the essential nutrients, screening values were derived based on recommended daily allowances (see Appendix B-1 of the General Information Report [ABB-ES, 1996]).
- <sup>6</sup> The values are from Florida Department of Environmental Protection's (FDEP's) "Groundwater Guidance Concentrations" dated June 1994 (FDEP, 1994a).
- <sup>7</sup> Analyte was included or excluded from the risk assessment for the following reasons:
- B = the maximum detected concentration did not exceed twice the arithmetic mean of detected concentrations at background locations and will not be considered further.
  - S = the maximum detected concentration did not exceed risk-based screening concentration and will not be considered further.
  - G = the maximum detected concentration did not exceed Florida guidance concentration and will not be considered further.
- <sup>8</sup> The value is based on hexavalent chromium.
- <sup>9</sup> The value is based on trivalent chromium.

Notes: The average of a sample and its duplicates is used for all table calculations.

Sample locations: CF14MW1S through CF14MW3S

Duplicate sample locations: CF14MW3SD

Background sample locations: CFBKMW1S through CFBKMW5S, CFBKMW7S, and CFBKMW8S. Duplicate at CFBKMW4SD.

\* = see footnote 2.

HHCP = human health chemical of potential concern.

µg/l = micrograms per liter.

NA = not applicable.

NSC = no screening concentration available.

ND = not detected in background.

R = rejected.

U = not detected.

UJ = not detected.

**Table 2-3**  
**Surface Water Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

Chemical	Frequency of Detection <sup>1</sup>	Range of Reporting Limits	Range of Detected Concentrations(*) <sup>2</sup>	Mean of Detected Concentrations <sup>3</sup>	Background Screening Concentrations <sup>4</sup>	Region IV Water Quality Standards <sup>5</sup>	Florida Class III Surface Water Quality Standards <sup>6</sup>	Analyte HHCPC? (Yes/No)	Reason <sup>7</sup>
<u><b>Volatile Organic Compounds (µg/l)</b></u>									
Acetone	1/4	2	5	5	NA	NS	NS	Yes	R
<u><b>Semivolatile Organic Compounds (µg/l)</b></u>									
bis(2-Ethylhexyl)phthalate	3/4	10	2 to 43	16	NA	1.8	3	Yes	
<u><b>Pesticides and PCBs (µg/l)</b></u>									
Endrin	1/4	0.1	0.0063	0.0063	NA	0.76	0.0023	No	S
<u><b>Inorganic Analytes (µg/l)</b></u>									
Aluminum	4/4	NA	254 to 634	434	1,040	200	NS	Yes	R
Barium	4/4	NA	6.7* to 12.9	9.7	43.7	2,000	NS	No	S
Beryllium	1/4	5	2.16	2	2.2	4	0.13	Yes	
Calcium	4/4	NA	1,050* to 11,000	3,900	43,000	1,055,398	NS	No	S
Copper	3/4	25	5.7 to 10.2	7.9	7.4	1,300	*500	No	S
Iron	4/4	NA	158 to 658	432	3,030	300	NS	Yes	
Magnesium	4/4	NA	553* to 1,040	840	5,580	118,807	NS	No	S
Manganese	4/4	NA	7.7 to 44.1	18.5	49.3	50	NS	No	S
Nickel	1/4	40	3.3	3.3	20	610	NS	No	S
Potassium	3/4	5,000	64.6 to 141	104	2,060	297,010	NS	No	S
Sodium	4/4	NA	2,290* to 4,080	3,160	12,180	396,022	NS	No	S
Vanadium	2/4	50	2.1 to 2.5	2.3	4.5	NS	NS	Yes	R
Zinc	1/4	20	90.3	90.3	51.4	5,000	*1.0	Yes	R
See notes at end of table.									



**Table 2-3 (Continued)**  
**Surface Water Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

<sup>1</sup> Frequency of detection is the number of samples in which the analyte was detected over the total number of samples analyzed (excluding rejected values).

<sup>2</sup> A value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, 1/2 the contract-required quantitation limit/contract-required detection limit is used as a surrogate.

<sup>3</sup> The mean of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R," "U," or "UJ" validation qualifiers.

<sup>4</sup> Background screening concentrations are from the NAS Cecil Field inorganic background data set.

<sup>5</sup> The value is from U.S. Environmental Protection Agency (USEPA) Region IV Water Quality Standards, dated January 1996 (USEPA, 1996b). For essential nutrients (calcium, magnesium, potassium, and sodium), the water quality values were derived based on recommended daily allowances.

<sup>6</sup> The values are from Florida Administrative Code (FAC), Chapter 62-302, for Class III freshwater bodies (for recreational use) dated January 1, 1995 (FAC, 1995). Only values protective of human health were used for screening.

<sup>7</sup> Analyte was included or excluded from the risk assessment for the following reasons:

S = the maximum detected concentration did not exceed the Region IV Water Quality Standard and will not be considered further.

R = no screening value is available; analyte is selected as HHCP.

<sup>8</sup> The surface water quality for this inorganic is hardness dependent.

Notes: The average of a sample and its duplicate is used for all table calculations.

Sample locations: CF14SW1, CF14SW2, CF14SW3, CF14SW4

Duplicate sample locations: CF14SW3SD

**Bold** = compound was detected at concentrations that exceeded all screening criteria.

a

\* = see footnote 2.

HHCP = human health chemical of potential concern.

µg/l = micrograms per liter.

NA = not applicable.

NS = no standard available.

PCB = polychlorinated biphenyl.

R = rejected.

U = not detected.

UJ = not detected.

**Table 2-4  
Sediment Contaminants**

Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida

Analytical Parameter	Frequency of Detection <sup>1</sup>	Range of Lower Reporting Limits	Range of Detected Concentrations	FDEP SQAG <sup>2</sup>	
				TEL	PEL
<b><u>Volatile Organic Compounds (mg/kg)</u></b>					
Acetone	4/4	0.012 to 0.014	0.005 J to <sup>3</sup> 0.0075 J	NC	NC
2-Butanone	1/4	0.012 to 0.014	<sup>3</sup> 0.002 J	NC	NC
<b><u>Semivolatile Organic Compounds (mg/kg)</u></b>					
Phenol	1/4	0.4 to 0.45	0.054 J	NC	NC
1,4-Dichlorobenzene	1/4	0.4 to 0.45	0.034 J	NC	NC
1,2,4-Trichlorobenzene	1/4	0.4 to 0.45	0.03 J	NC	NC
Acenaphthalene	1/4	0.4 to 0.45	0.023 J	0.00671	0.0889
Diethylphthalate	3/4	0.4 to 0.45	0.073 J to 2.4	NC	NC
Dimethylphthalate	1/4	0.4 to 0.45	<sup>3</sup> 0.02 J	NC	NC
Di- <i>n</i> -butylphthalate	4/4	0.8 to 0.90	<sup>4</sup> 1.9 to <sup>4</sup> 3.5	NC	NC
Butylbenzylphthalate	2/4	0.4 to 0.45	<sup>3</sup> 0.065 J to 1.3	NC	NC
bis(2-Ethylhexyl)phthalate	2/4	0.4 to 0.45	<sup>3</sup> 0.015 J to 2.1	0.182	2.647
Pyrene	1/4	0.4 to 0.45	0.029 J	0.153	1.348
<b><u>Total Recoverable Petroleum Hydrocarbons (TRPH) (mg/kg)</u></b>					
TRPH	1/4	12 to 14	16 J	NC	NC
<b><u>Inorganic Analytes (mg/kg)</u></b>					
Aluminum	4/4	40	315 to 2,560	NC	NC
Barium	4/4	40	<sup>3</sup> 0.86 to 3.1	NC	NC
Chromium	4/4	2	0.69 to 3.1	52.3	160
Copper	4/4	5	0.80 to 0.94	18.7	108
Iron	4/4	20	85.9 to 444	NC	NC
Magnesium	1/4	1,000	57	NC	NC
Manganese	4/4	3	0.48 to 2.4	NC	NC
Nickel	1/4	8	1	15.9	42.8
Potassium	1/4	1,000	20.3	NC	NC
Vanadium	4/4	10	0.53 to 2.4	NC	NC

<sup>1</sup> Frequency of detection is the number of samples in which the compound was detected over the total number of samples analyzed (CF14SD1, CF14SD2, CF14SD3, and CF14SD4, including a duplicate at CF14SD3).

<sup>2</sup> FDEP, *Approach to the Assessment of Sediment Quality in Florida Coastal Waters*, November 1994 (FDEP, 1994b).

<sup>3</sup> Average of sample and duplicate.

<sup>4</sup> Concentration values are from diluted samples.

Notes: Bold indicates parameter was detected at a concentration greater than SQAG-TEL guideline values.

FDEP = Florida Department of Environmental Protection.

SQAG = sediment quality assessment guidelines.

TEL = threshold effect level.

PEL = probable effect level.

mg/kg = milligrams per kilogram.

J = estimated concentration.

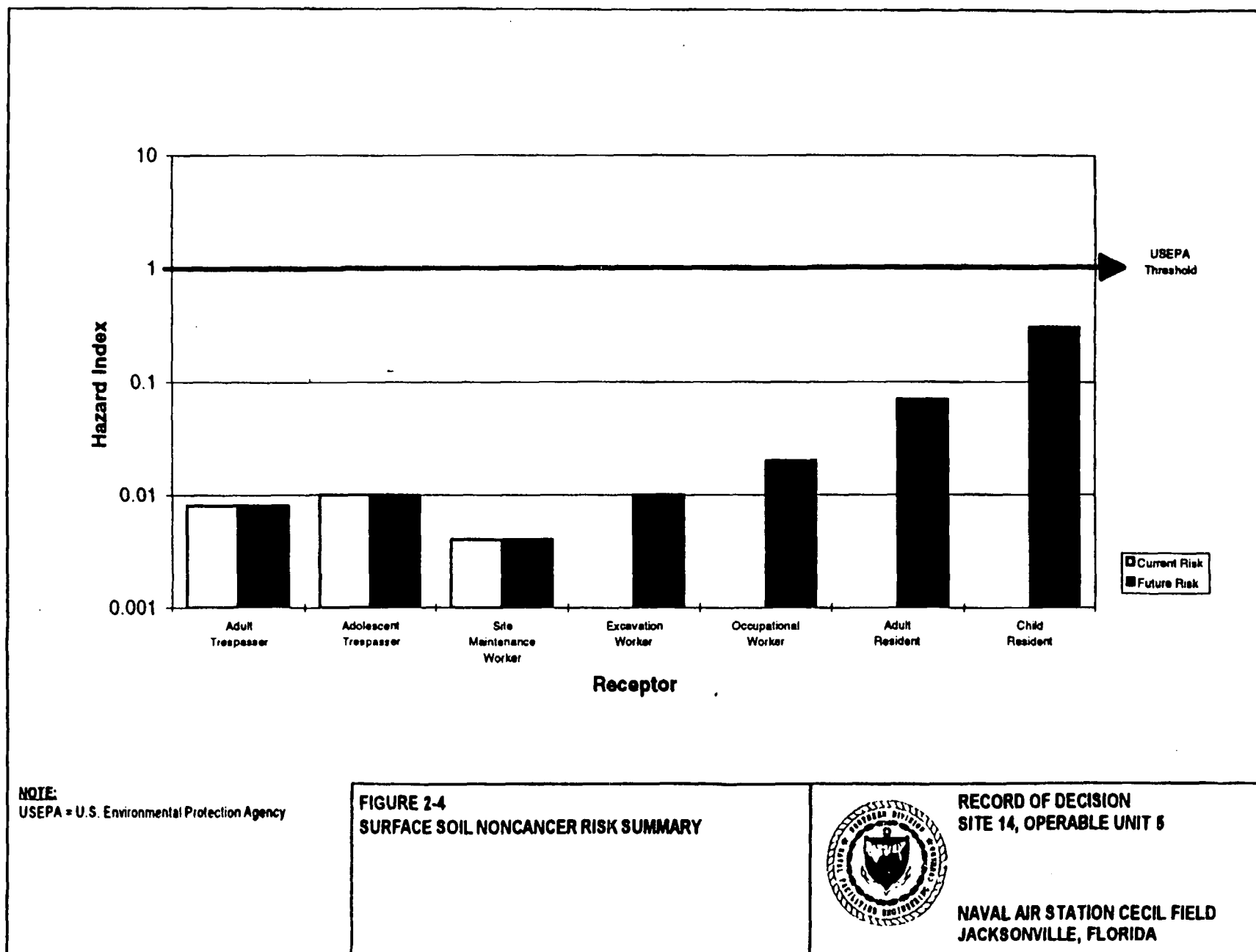
NC = no criteria available.

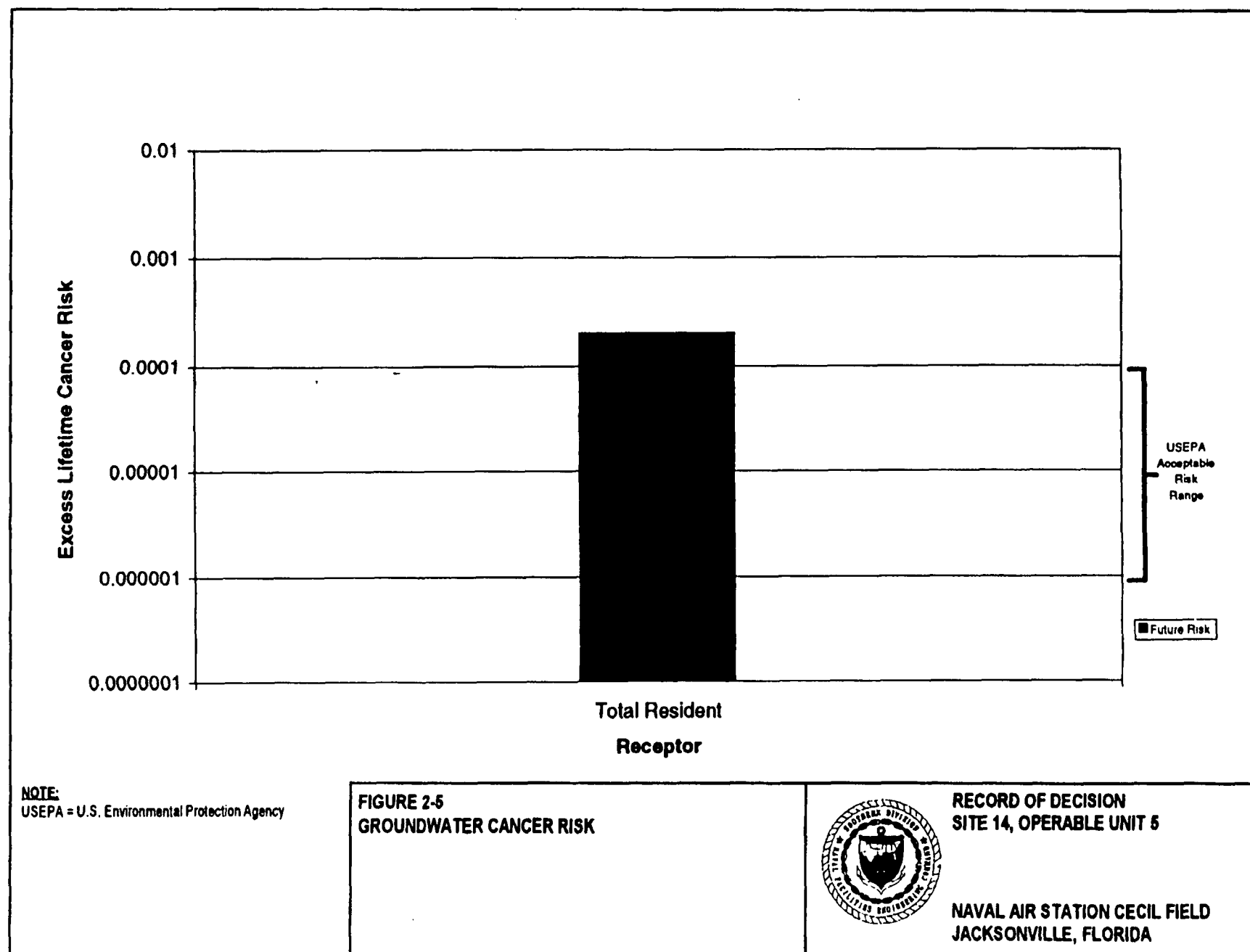
**Record of Decision  
Site 14, Operable Unit 5  
Naval Air Station Cecil Field  
Jacksonville, Florida**

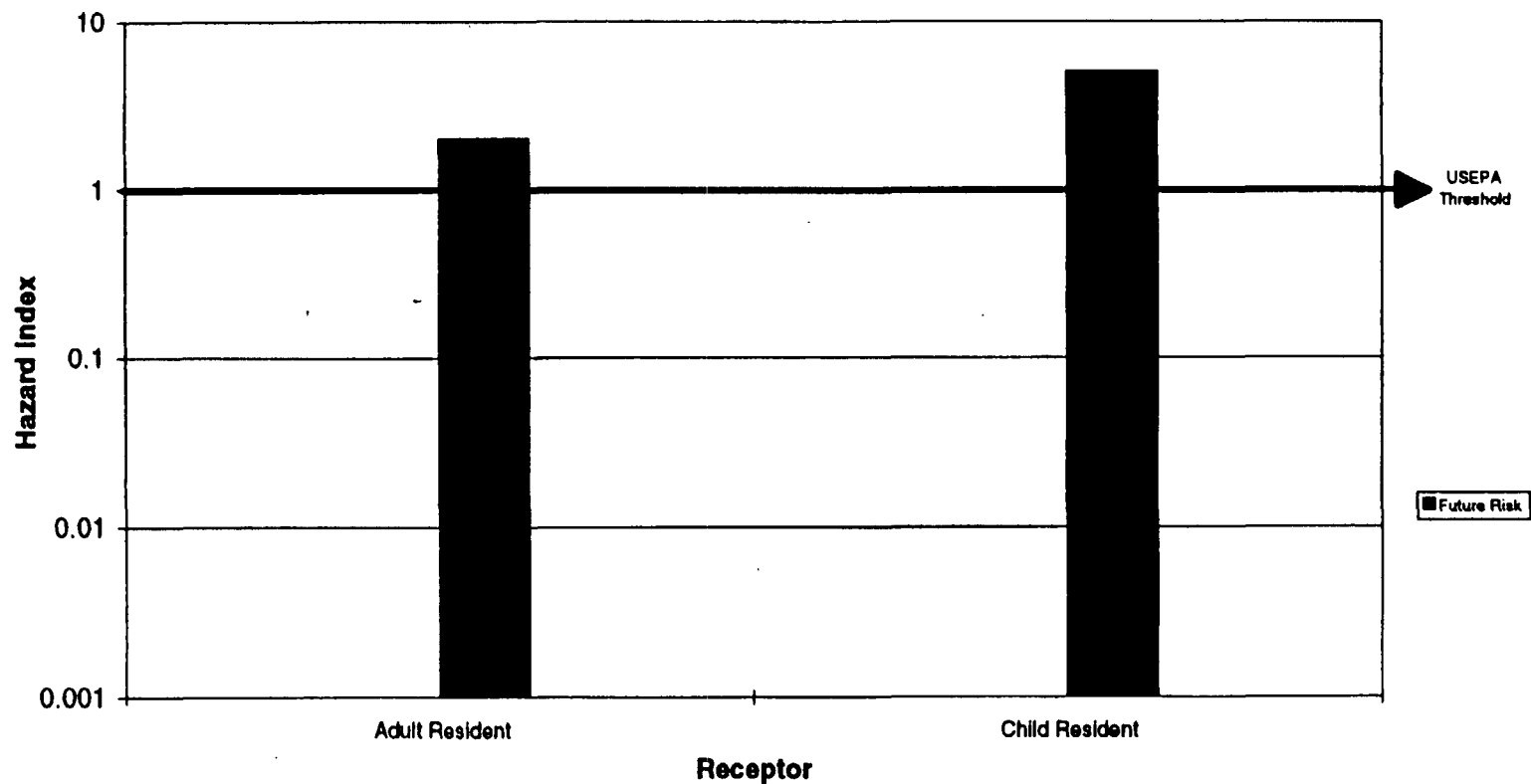
	Surface Soil		Groundwater		Surface Water			
	Current Land Use <sup>1</sup>	Future Land Use <sup>1</sup>	Future Land Use		Current Land Use		Future Land Use	
			HI	ELCR	HI	ELCR	HI	ELCR
Total Adult Trespasser	0.008	0.008	--	--	0.02	$8 \times 10^{-6}$	0.02	$8 \times 10^{-6}$
Total Adolescent Trespasser	0.01	0.01	--	--	0.02	$5 \times 10^{-6}$	0.02	$5 \times 10^{-6}$
Total Risk to Trespasser	--	--	--	--	NC	$1 \times 10^{-6}$	NC	$1 \times 10^{-6}$
Total Site Maintenance Worker	0.004	0.004	--	--	--	--	--	--
Total Excavation Worker	0.01	0.01	--	--	--	--	--	--
Total Occupational Worker	--	0.02	--	--	--	--	--	--
Total Adult Resident	--	0.07	2	$1 \times 10^{-4}$	--	--	0.04	$2 \times 10^{-5}$
Total Child Resident	--	0.3	5	$6 \times 10^{-5}$	--	--	0.08	$1 \times 10^{-6}$
Total Risk to Resident	--	--	NC	$2 \times 10^{-4}$	NC	NC	NC	$3 \times 10^{-6}$

<sup>1</sup> No carcinogenic human health chemicals of potential concern were selected; therefore, ELCR was not calculated.

Notes: HI = hazard index.  
 ELCR = excess lifetime cancer risk.  
 NC = not calculated.  
 -- = not analyzed.







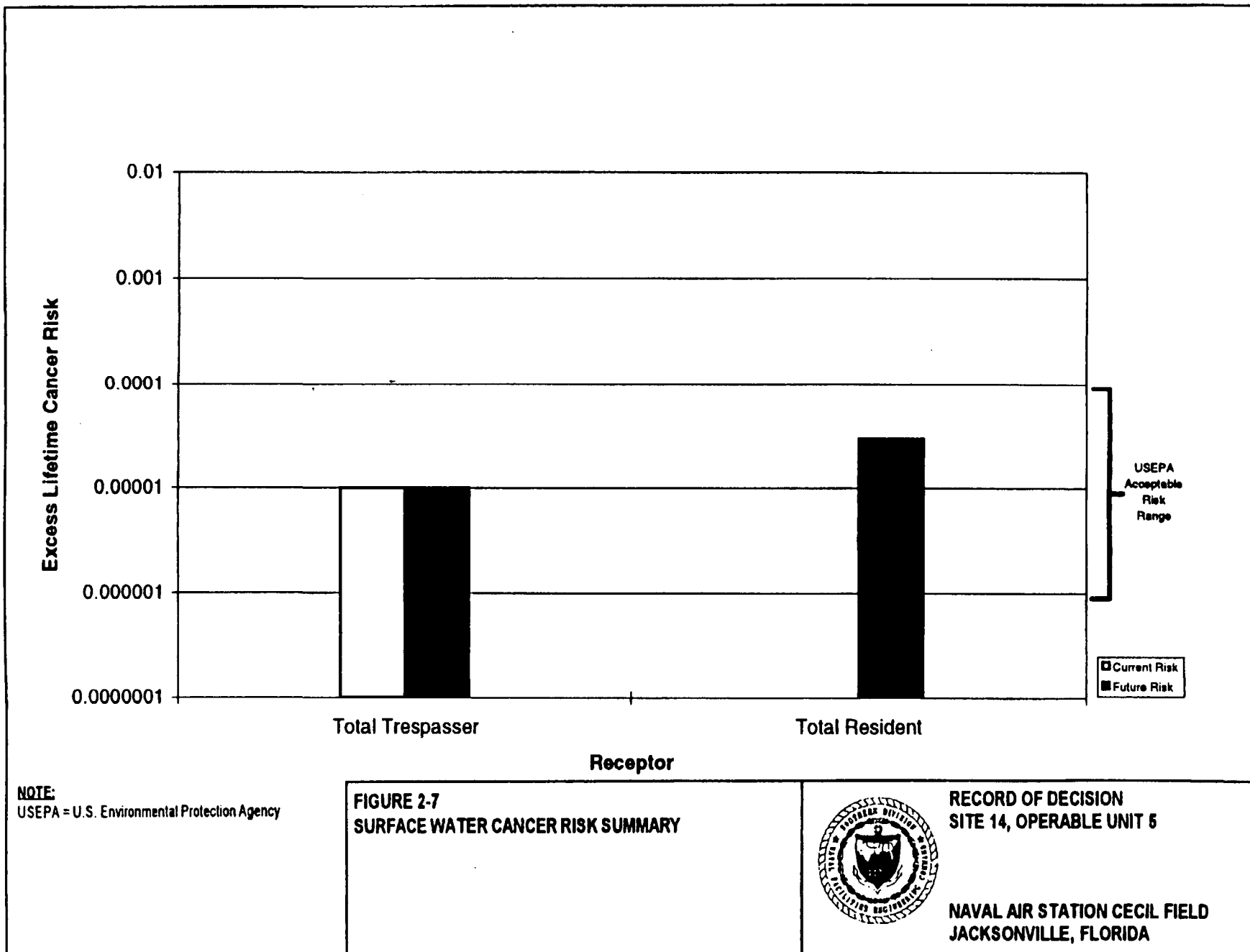
**NOTE:**  
USEPA = U.S. Environmental Protection Agency

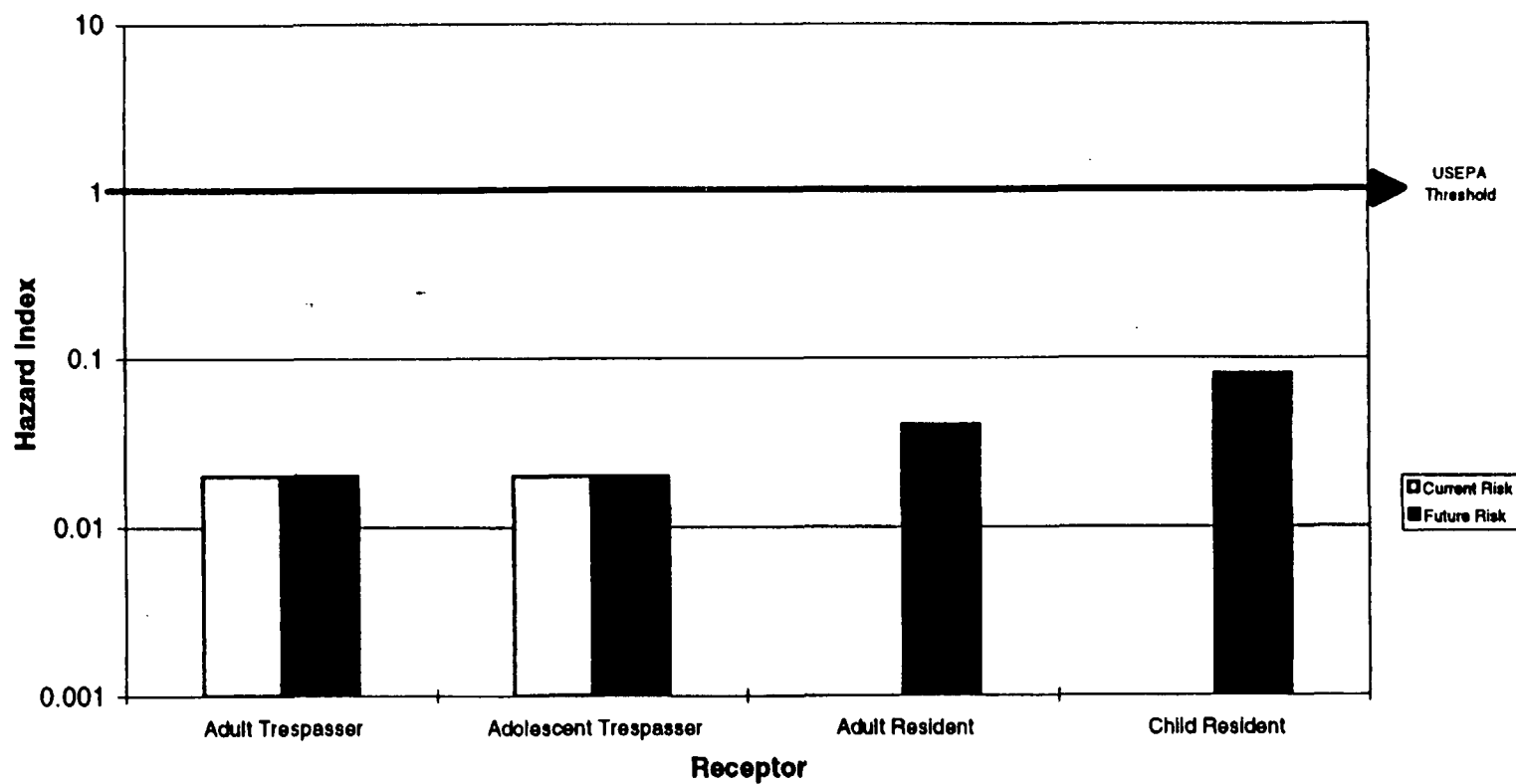
**FIGURE 2-6  
GROUNDWATER NONCANCER RISK SUMMARY**



**RECORD OF DECISION  
SITE 14, OPERABLE UNIT 5**

**NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**





**NOTE:**  
USEPA = U.S. Environmental Protection Agency

**FIGURE 2-8  
SURFACE WATER NONCANCER RISK SUMMARY**



**RECORD OF DECISION  
SITE 14, OPERABLE UNIT 5**

**NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**



**Groundwater.** Based on the future use scenario, an excess lifetime cancer risk (ELCR) of 2 in 10,000 ( $2 \times 10^{-4}$ ) was identified due to the presence of beryllium and a noncancer hazard index of 2 (adult resident) and 5 (child resident) were identified due to the presence of thallium (these scenarios are based on the use of groundwater from the shallow surficial aquifer as drinking water). These risks exceed USEPA and FDEP risk criteria. However, the beryllium concentrations in groundwater at Site 14 are less than the State and Federal screening criteria and are below the NAS Cecil Field background concentrations. Thallium, a naturally occurring element, posed a potential noncancerous hazard to humans. However, the concentration of thallium in groundwater was below the NAS Cecil Field inorganic background concentration.

Other contributors to noncancer risk from exposure to groundwater come from iron and aluminum. These concentrations, however, were also below the NAS Cecil Field background values for groundwater.

**Surface Water.** Risks to all human receptors fall within the USEPA's acceptable risk range for both current and future land use, but exceeded the FDEP target risk of  $1 \times 10^{-6}$ . The current ELCR associated with surface water (ingestion or dermal contact) is  $1 \times 10^{-5}$  for an aggregate (combined adult and child) trespasser. The future risk associated with surface water (ingestion or dermal contact) is  $3 \times 10^{-5}$  for an aggregate (combined adult and child) resident. The major contributors to this risk are BEHP and beryllium. The site trespasser scenario considers a population that utilizes the surface water for activities such as fishing, wading, or swimming. Surface water occurs in the ditches at Site 14 and low areas on the site property. These areas do not contain water year round and would not be able to support any sport fishing or other recreational use, such as swimming or wading. The surface water does pose a risk to human health at Site 14, but the exposure to humans is unlikely due to the small amounts of surface water actually at the site and the minimal human activity at this site. Additionally, the chemicals (BEHP and beryllium) that pose a risk in surface water were not detected in a follow-up sampling event. These supplemental data were not included in the risk assessment. Therefore, the actual risk may be overestimated.

**Ecological Risk Assessment (ERA).** The purpose of the ERA was to characterize the risks associated with the potential exposures to site-related contaminants at Site 14 for ecological receptors. Potential risks were evaluated for selected contaminants at the site. Results from the ERA indicated that the potential for ecological risk is minimal to nonexistent.

**2.7 DESCRIPTION OF THE NO ACTION ALTERNATIVE.** Based on the risk assessment, no unacceptable human health or ecological risks were identified at Site 14, OU 5. Therefore, no action is needed and no other remedial alternatives were considered.

Under the No Action alternative, no treatment will be performed. According to the CERCLA regulations, Section 121, if no action is the preferred action, no applicable or relevant and appropriate requirements apply to the site.

Because Site 14, OU 5, poses no unacceptable risk and the No Action alternative is warranted, it does satisfy the CERCLA criteria. The No Action alternative is intended to be the final action. This solution is meant to be permanent and

effective in both the long and short term. The No Further Action decision is the least-cost option with no capital, operating, or monitoring costs and is protective of human health and the environment.

2.8 DOCUMENTATION OF SIGNIFICANT CHANGES. No significant changes have been made to this decision for No Further Action at Site 14, OU 5.

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**ATTACHMENT A**  
**RESPONSIVENESS SUMMARY**

A public comment on the Site 14 Proposed Plan was received by the PAO at Cecil Field. The comment was from Mrs. Frances Tabbott, 3544 Alcoy Road. Apparently her property is located east of Yellow Water Weapons area, at least 2 miles directly related to Site 14. There were several parts to the comment, but the only part is as follows:

Mrs. Tabbot experienced some flooding on her property and is concerned that she may experience some sort of groundwater or surface water contamination from Site 14 on her property.

Response: Surface water at Site 14 has been observed to be present as standing water in ditches surrounding the site. Water is not present in the ditches throughout the year and surface water flow away from Site 14 has not been observed. The area around Site 14 is flat and swampy and ditches are not connected to any surface water drainage system. Based on the USGS groundwater flow model, Site 14 is a recharge area and groundwater flow is downward to the Floridan Aquifer. No lateral flow away from Site 14 is expected.

No contaminants were detected at concentrations which generate an unacceptable human health risk per USEPA risk assessment criteria. Therefore no further remedial action is proposed for Site 14.

Based on these physical and chemical observations, it is not anticipated that Mrs. Tabbot's property will be impacted by surface water or groundwater from Site 14.