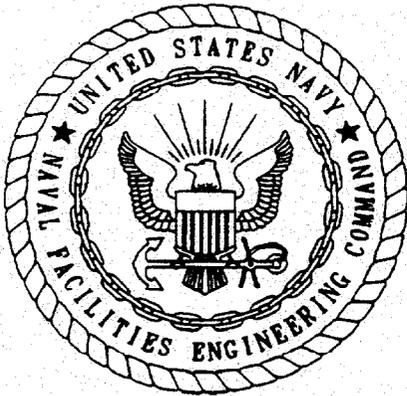


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RECORD OF DECISION AT SITE 2, NORTHWEST OPEN DISPOSAL AREA NAS WHITING
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HARDING LAWSON ASSOCIATES

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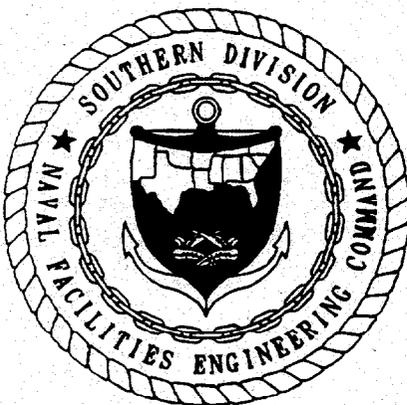


**RECORD OF DECISION
SITE 2, NORTHWEST OPEN DISPOSAL AREA**

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

**UNIT IDENTIFICATION CODE: N60508
CONTRACT NO.: N62467-89-D-0317/116**

SEPTEMBER 1999



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



Harding Lawson Associates
Engineering and Environmental Services
2590 Executive Center Circle East
Tallahassee, Florida 32301 - (850) 656-1293



April 12, 2000

Mr. Craig Benedikt
Remedial Project Manager
Federal Facilities Branch
USEPA Region IV
61 Forsyth Street.
Atlanta, Georgia 30303

**Subject: Revised Appendix B, Land-Use Control Implementation Plan
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field, Milton, Florida
Contract No. N62467-89D-0317/116**

Dear Craig:

Enclosed please find replacement pages for the Site 2, Final Record of Decision (ROD). Please discard pages B-1 and B-2 (Appendix B) from the previously submitted ROD with the enclosed revised pages.

If you have any questions please call me at (850) 656-1293.

Sincerely,

HARDING LAWSON ASSOCIATES

A handwritten signature in cursive script, appearing to read 'Rao Angara', is written over the typed name.

Rao Angara
Task Order Manager

enclosure

cc: J. Cason, FDEP (2 copies)
L. Martin, SDIV (2 copies)
J. Holland, NASWF (2 copies)
P. Ottinger, TtNUS (1 copy)
T. Hansen, TtNUS (1 copy)
A. Twitty, CH2M Hill (1 copy)
File



Harding Lawson Associates



September 28, 1999

2534-2033a

Mr. Craig Benedikt, Remedial Project Manager
Federal Facilities Branch
USEPA Region IV
61 Forsyth Street
Atlanta, Georgia 30303

**Subject: Revised Final Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field, Milton, Florida
Contract No. N62467-89D-0317/116**

Dear Craig:

On behalf of Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Harding Lawson Associates is pleased to submit the final Site 2 Record of Decision (ROD). Copies of the final ROD have also been forwarded to the Naval Air Station Whiting Field partnering team.

If you have any questions please call me at (850) 656-1293.

Sincerely,

HARDING LAWSON ASSOCIATES

A handwritten signature in cursive script, appearing to read 'Rao Angara', is written over the typed name.

Rao Angara
Principal Project Manager

enclosure

cc: Ms. L. Martin, SDIV (2 copies)
Ms. A. Twitty, CH2M Hill (1 copy)
Mr. J. Cason, FDEP (2 copies)
Mr. T. Conrad, BEI (1 copy)
Mr. T. Hansen, TtNUS (1 copy)
Mr. G. Walker, TtNUS (1 copy)
Mr. P. Ottinger, TtNUS (1 copy)
Mr. J. Holland, NASWF (2 copies)
Mr. E. Blomberg, HLA (1 copy)
File



**RECORD OF DECISION
SITE 2, NORTHWEST OPEN DISPOSAL AREA**

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

Unit Identification Code: N60508

Contract No.: N62467-89-D-0317/116

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**

Linda Martin, Code 1859, Engineer-in-Charge

September 1999



**CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)**

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/116 are complete and accurate and comply with all requirements of this contract.

DATE: September 28, 1999

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)

TABLE OF CONTENTS

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

<u>CHAPTER</u>	<u>TITLE</u>	<u>PAGE NO.</u>
1.0	DECLARATION OF THE RECORD OF DECISION.....	1-1
1.1	SITE NAME AND LOCATION	1-1
1.2	STATEMENT OF BASIS AND PURPOSE.....	1-1
1.3	ASSESSMENT OF THE SITE.....	1-1
1.4	DESCRIPTION OF THE SELECTED REMEDY.	1-2
1.5	DECLARATION STATEMENT.	1-2
1.6	SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.	1-2
2.0	DECISION SUMMARY	2-1
2.1	SITE NAME, LOCATION, AND DESCRIPTION.....	2-1
2.2	SITE HISTORY AND ENFORCEMENT ACTIVITIES.....	2-1
2.3	HIGHLIGHTS OF COMMUNITY PARTICIPATION.	2-1
2.4	SCOPE AND ROLE OF REMEDIAL ACTION SELECTED FOR SITE 2.	2-1
2.5	SITE CHARACTERISTICS.	2-5
2.5.1	Aerial Photography Evaluation	2-5
2.5.2	Background	2-6
2.5.3	Surface Soil.....	2-6
2.5.4	Subsurface Soil	2-6
2.5.5	Groundwater.....	2-6
2.5.6	Migration Pathways	2-6
2.6	SUMMARY OF SITE RISKS.	2-7
2.6.1	Human Health Risk Assessment	2-7
2.6.2	Ecological Risk Assessment (ERA).....	2-9
2.6.3	Risk Summary.....	2-13
2.7	DESCRIPTION OF ALTERNATIVES.	2-13
2.8	SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES.....	2-15
2.8.1	Threshold Criteria	2-15
2.8.2	Primary Balancing Criteria	2-16
2.8.3	Modifying Criteria	2-17
2.9	SELECTED ALTERNATIVE.....	2-18
2.10	STATUTORY STATEMENT.	2-18
2.11	DOCUMENTATION OF SIGNIFICANT CHANGES.....	2-18

REFERENCES

APPENDICES

Appendix A: Community Relations Responsiveness Summary

Appendix B: Land-Use Control Implementation Plan

LIST OF TABLES

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Figure	Title	Page No.
2-1	Location Map, Site 2	2-2
2-2	Record of Decision Site 2, Northwest Open Disposal Area	2-3

LIST OF TABLES

Table	Title	Page No.
2-1	Investigative History.....	2-4
2-2	Summary Of Human Health Chemicals Of Potential Concern	2-8
2-3	Risk Summary Current Land Use.....	2-10
2-4	Risk Summary Future Land Use.....	2-11
2-5	Summary Of Ecological Chemicals Of Potential Concern (ECPCs).....	2-12
2-6	Summary of Remedial Alternatives Evaluated for Site 2.....	2-14
2-7	Comparison of Selected Remedy with Nine Evaluation Criteria	2-19
2-8	Summary Of Federal And State ARARsAnd Guidance Specific To Alternative	2-20

GLOSSARY

AR	Administrative Record
ARAR	Applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPC	Chemical of potential concern
ERA	Ecological risk assessment
FDEP	Florida Department of Environmental Protection
FS	Feasibility study
HHRA	Human health risk assessment
HI	Hazard index
HLA	Harding Lawson Associates
HQ	Hazard quotient
IR	Installation restoration
LUC	Land-use control
LUCIP	Land-use control implementation plan
mg/kg	Milligrams per kilogram
MOA	Memorandum of Agreement
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Contingency Plan
RA	Remedial action
RAO	Remedial action objective
RBC	Risk based concentration
RCRA	Resource Conservation and Recovery Act
RfD	Reference dose
RI	Remedial investigation
ROD	Record of Decision
SCTL	Soil cleanup target level
USEPA	U.S. Environmental Protection Agency

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION

Site 2, Northwest Open Disposal Area, is a 12-acre parcel located along the northwestern facility boundary near the North Air Field at Naval Air Station (NAS) Whiting Field, Milton Florida.

1.2 STATEMENT OF BASIS AND PURPOSE.

This decision document presents the selected remedial action (RA) for Site 2 at NAS Whiting Field. The selected action was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP). The information supporting this RA decision is contained in the Administrative Record (AR) for this site. The Information Repository, including the AR, is located at the West Florida Regional Library, Milton Branch, 805 Alabama Street, Milton, Florida, (850) 623-5565.

The purpose of the RA at Site 2 is to implement land-use controls (LUCs) to minimize future predicted risks. The LUCs will establish controls for land use at the site to nonresidential use as specified in the LUCIP in Appendix B. These controls will be incorporated into a Memorandum of Agreement (MOA) between NAS Whiting Field, U.S. Environmental Protection Agency (USEPA), and Florida Department of Environmental Protection (FDEP). The USEPA and the State of Florida concur with the selected remedy.

Through the MOA, NAS Whiting Field, on behalf of the Department of the Navy, will agree to implement periodic basewide site inspections and agency notification procedures designed to ensure the maintenance by NAS Whiting Field personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment.

A fundamental premise underlying execution of the MOA is the Navy's substantial good-faith compliance with the procedures called for in the MOA. Reasonable assurances will be provided to USEPA and FDEP as to the permanency of the remedy, including the specific LUC maintenance commitments stated in the MOA. Should such compliance not occur or should the MOA be terminated, USEPA and FDEP reserve the right to reconsider the protectiveness of the remedy concurred upon in this ROD and USEPA and FDEP may require that NAS Whiting Field take additional measures to adequately ensure necessary future protection of human health and the environment.

1.3 ASSESSMENT OF THE SITE.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present a current or potential threat to public health, welfare, or the environment. No human health risk was identified for Site 2 surface soil when compared to USEPA carcinogenic and noncarcinogenic risk criteria. However, the FDEP target carcinogenic risk level of 1×10^{-6} was exceeded by the hypothetical future resident exposure scenario (2×10^{-5}) due to the presence of arsenic in surface soil. The noncancer risk from exposure to surface soil was below the FDEP target hazard index of 1. A discussion of these potential threats by media (e.g., soil, sediment, etc.) is presented in this document in Section 2.6.

1.4 DESCRIPTION OF THE SELECTED REMEDY.

This ROD presents the final action for surface and subsurface soils at Site 2 and is based on results of the Remedial Investigation (RI) and Feasibility Study (FS) completed for surface and subsurface soils for Site 2. This ROD is not the final remedy for groundwater which is being addressed as a separate site. The preferred RA at Site 2 is Alternative 2 (LUCs) and includes 5-year site reviews to evaluate the effectiveness of the LUCs. The LUCs will establish controls limiting land use at the site to nonresidential use as specified in the LUCIP in Appendix B. These controls will be incorporated into the MOA. The 5-year reviews will verify the selected alternative is protective of human health and the environment in future years.

Alternative 2 was selected to address principal threats and risks identified for Site 2. Implementing Alternative 2 would address current and future risks associated with contaminants present at Site 2. The Navy estimates the present worth cost of Alternative 2 would be \$193,000 over a 30-year period. The selected action would be implemented for an indefinite period of time.

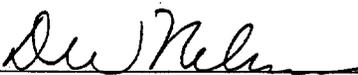
This ROD only addresses surface and subsurface soils located at Site 2. Consequently, this ROD does not address actual or potential groundwater contamination at the site. Groundwater has been identified as a separate site (Site 40) and will be addressed in a future RI/FS.

1.5 DECLARATION STATEMENT.

The RA selected for surface and subsurface soils at Site 2 is protective of human health and the environment, complies with Federal and State regulatory requirements legally applicable or relevant and appropriate (ARARs) to the RA, and is cost effective. This remedy does not utilize a permanent solution. Alternative treatment technologies were evaluated in the FS. However, because treatment of the principal threats was not found to be practicable, the selected remedy does not satisfy the statutory preference for treatment as a principal element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within 5 years after commencement of the RA to ensure the remedy continues to provide adequate protection of human health and the environment.

1.6 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.



Capt. D.W. Nelms
Commanding Officer, NAS Whiting Field

29 Sep 99
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION.

Site 2, also known as the Northwest Open Disposal Area, is a 12-acre parcel of land located along the northwestern boundary of the installation near the North Air Field at NAS Whiting Field (Figure 2-1). The site served as an old borrow pit that is currently a surface depression. The relief at the site is approximately 25 feet (Figure 2-2). The site is currently covered with dense, low-lying vegetation. Some wood debris is located in the center portion of the site.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES.

According to the Initial Assessment Study (Envirodyne Engineers, Inc., 1985), the site was used as an open disposal area primarily for construction and demolition debris from 1976 until 1984. Wastes disposed of at the site include asphalt, wood, tires, furniture, and similar materials that were not suitable for landfill disposal. Crushed paint cans and scrap metal parts have been scattered throughout the site.

Site 2 has undergone several phases of investigations since 1985. Table 2-1 presents a summary of these activities.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION.

The RI report (Harding Lawson Associates [HLA], 1998a), the FS (HLA, 1998b), and the Proposed Plan (HLA, 1999) for Site 2 were completed and released to the public in April 1999. These documents, and other Installation Restoration (IR) program information, are contained within the Administrative Record in the information repository located at the West Florida Regional Library, Milton, Florida.

Publication of the notice of availability of the RI, FS, and Proposed Plan targeted the communities closest to NAS Whiting Field. The availability notice presented information on the RI/FS at Site 2 and invited community members to submit written comments on the Proposed Plan.

A public comment period was held from April 9, 1999 to May 10, 1999, to solicit comments on the Proposed Plan. In addition, a public meeting was held on April 18, 1999. Representatives from NAS Whiting Field, SOUTHNAVFACENGCOM, USEPA, FDEP, and the Navy's environmental consultants, presented information on the results of the Site 2 RI, the FS, and solicited comments from the community. Comments received at the public meeting and during the public comment period are presented in the Responsiveness Summary in Attachment A. Responses to the comments received during the public comment period are also included in the Responsiveness Summary.

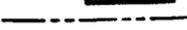
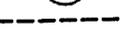
2.4 SCOPE AND ROLE OF REMEDIAL ACTION SELECTED FOR SITE 2.

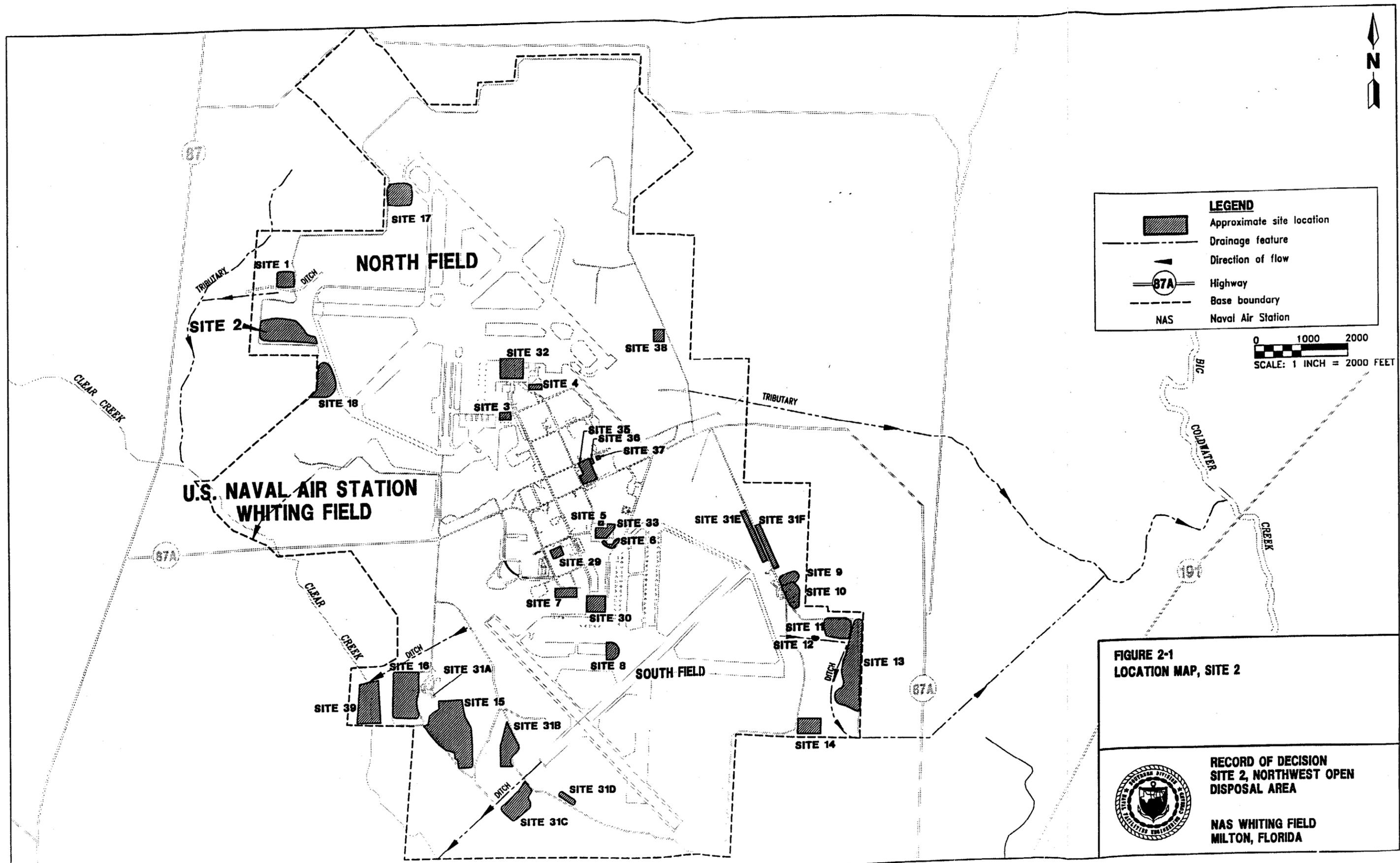
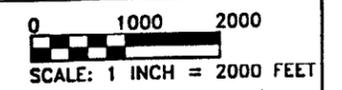
Investigations at Site 2 have indicated contamination at the site does not pose unacceptable risk to human and ecological receptors given a nonresidential land-use scenario and the implementation of LUCs. Therefore, the purpose of the RA for Site 2 is to maintain the use of the land for nonresidential purposes.

Based on previous investigations, remedial action objectives (RAOs) and chemical-specific action levels were identified. The primary chemical of concern at the site is arsenic in surface soil. Because Site 2, and several other sites at NAS Whiting Field, are disposal sites where the cover fill was most likely brought to the site from an off-site borrow source, the Navy requested the FDEP consider a site-specific soil cleanup goal for arsenic. The Navy recommended a soil cleanup goal for arsenic at NAS Whiting Field disposal sites



LEGEND

-  Approximate site location
-  Drainage feature
-  Direction of flow
-  Highway
-  Base boundary
-  Naval Air Station

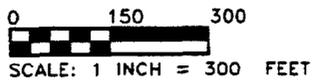
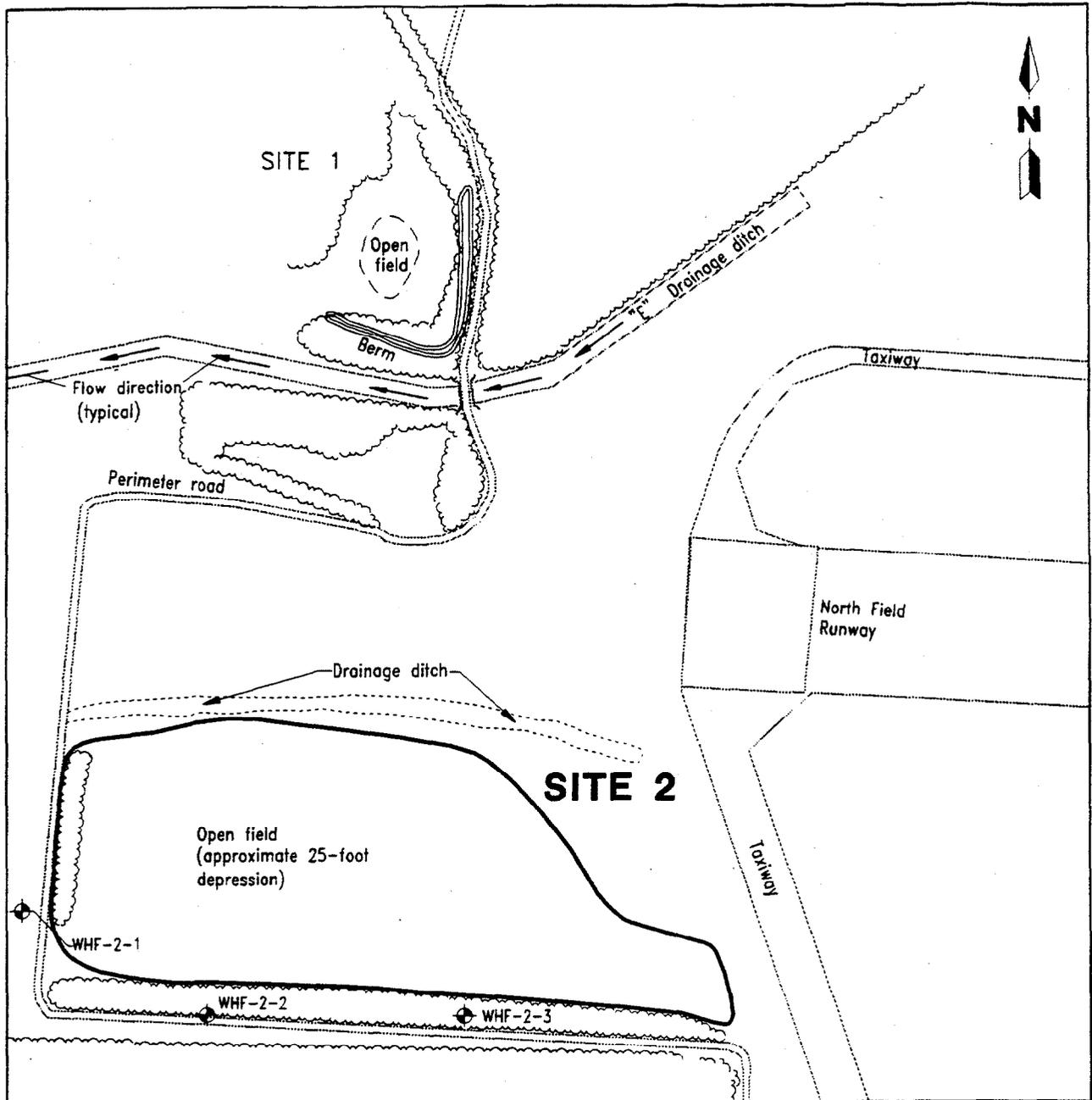


**FIGURE 2-1
LOCATION MAP, SITE 2**



**RECORD OF DECISION
SITE 2, NORTHWEST OPEN
DISPOSAL AREA**

**NAS WHITING FIELD
MILTON, FLORIDA**



LEGEND	
	WHF-2-3 Monitoring well location and designation
	Area of planted pine trees
	Older tree line
	Approximate site boundary and land-use control area
	Naval Air Station

FIGURE 2-2
SITE 2, GENERAL FEATURES



RECORD OF DECISION
SITE 2, NORTHWEST OPEN
DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

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**Table 2-1
Investigative History**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Date	Investigation Title	Activities	Findings
1985	IAS, NAS Whiting Field, Milton, Florida (Envirodyne Engineers, Inc.)	<ul style="list-style-type: none"> • Review of historical records and aerial photographs. • Field inspections and personal interviews. 	<ul style="list-style-type: none"> • From 1976 until 1984, Site 2 was used as an open disposal area primarily for construction and demolition debris. • Site 2 was not recommended for additional investigation due to the nonhazardous nature of the waste reportedly disposed of there.
1992-1998	Remedial Investigation Report, Site 2, NAS Whiting Field, Milton, Florida (HLA, 1998a)	<ul style="list-style-type: none"> • Cone Penetrometer (PCPT) and BAT groundwater sampling. • Hydrogeologic assessment • Aquifer flow testing. • Collection of surface soil samples. • Collection of subsurface soil samples. • Installation of four groundwater monitoring wells. • Collection of groundwater samples. • Human Health Risk Assessment. • Ecological Risk Assessment. 	<ul style="list-style-type: none"> • The groundwater flow direction is to the south-southwest and discharges at Clear Creek. Clear Creek is located approximately 4,000 feet southwest of the site. • The Human Health Risk Assessment determined that the carcinogenic risk from exposure to surface soil was within USEPA's acceptable risk range for current or future hypothetical future residents at Site 2. • The total excess lifetime cancer risk associated with exposure to surface soil by a hypothetical future resident (2×10^{-5}), current and future trespasser (2×10^{-6}), and occupational worker (3×10^{-6}) exceeded FDEP's target level of concern (1×10^{-6}) due to the presence of arsenic. • The noncancer hazards associated with ingestion and direct contact of soil under current and hypothetical future land uses are below USEPA and FDEP target hazard index (HI) of 1. • The Ecological Risk Assessment does not predict risks to plants from surface soil. • Soil and food items containing chemicals from Site 2 are unlikely to have lethal effects to wildlife receptors. • Lethal and sublethal exposures to representative wildlife species are unlikely to result in adverse effects to reproduction and survival (hazard quotients are less than 1.0).

Notes: IAS = initial assessment study.
NAS = Naval Air Station.
HLA = Harding Lawson Associates.

BAT = Bengt-Arne-Torstensson.
FDEP = Florida Department of Environmental Protection.
USEPA = U.S. Environmental Protection Agency.

(Sites 1, 2, 9, 10, 11, 12, 13, 14, 15, and 16) of 4.62 milligrams per kilogram (mg/kg). The FDEP and USEPA have concurred with the use of this goal at these disposal sites given the following conditions (FDEP, 1998):

1. The sites may be utilized for activities that involve less than full-time contact with the site. This may include, but is not limited to, a) parks, b) recreation areas that receive heavy use (such as soccer or baseball fields), or c) agricultural sites where farming practices result in moderate site contact (approximately 100 days per year or less).
2. The Navy must ensure adherence to the land use by incorporating the site and restricted use conditions in a legally binding LUC agreement.
3. The above soil cleanup goal shall not be utilized at any other site without specific FDEP approval.

The groundwater at NAS Whiting Field has been designated as a separate site (Site 40, Facilitywide Groundwater). If chemicals in the groundwater are posing a threat to human and/or ecological receptors, they will be evaluated as part of the Site 40 RI/FS; therefore, groundwater is not considered in this ROD.

The RAO for Site 2, establish and maintain a LUC plan for Site 2, was developed because the use of the site-specific cleanup goal for arsenic required the implementation of LUCs. Under USEPA Region IV guidance, the use of LUCs as a remedy for contaminated sites requires the development of a LUC Assurance Plan, which may be documented in a MOA, as well as a site-specific LUC Implementation Plan (LUCIP). This document details the actions required when LUCs are selected as a remedy for a site.

The MOA is developed for the entire installation where LUCs are necessary. This document indicates the Navy agrees to implement certain periodic site inspections, condition certifications, and agency notification procedures basewide to ensure the maintenance (by NAS Whiting Field personnel) of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of a MOA is the Navy's substantial good-faith compliance with the procedures called for in the MOA. Reasonable assurances will be provided to USEPA and FDEP as to the permanency of those remedies, including the use of specific LUCs (or development of LUCIPs). It is agreed by the Navy, USEPA, and FDEP that the contemplated permanence of the remedy would be dependent upon NAS Whiting Field's substantial good-faith compliance with the specific LUC maintenance commitments stated in the MOA. Should such compliance not occur or should the MOA be terminated, USEPA and FDEP reserve the right to reconsider the protectiveness of the remedy concurred upon in the ROD and USEPA and FDEP may require NAS Whiting Field take additional measures to adequately ensure necessary future protection of human health and the environment.

2.5 SITE CHARACTERISTICS.

The goal of the RI conducted for Site 2 was to collect data to determine the nature and extent of releases of site-derived contaminants; identify potential pathways of migration via the vadose zone, soil, or groundwater; and evaluate risks to human and ecological receptors. Other media (e.g., surface water, sediment, etc.) were not evaluated because they are not present at the site.

2.5.1 Aerial Photography Evaluation

Historical aerial photographs, provided by the Navy at the Public Works Office, were evaluated during the planning phases of the RI. The objective of the evaluation was to determine the operational history of the site and to verify earlier historical accounts.

2.5.2 Background

A background sampling program was completed for the main base of NAS Whiting Field to establish concentrations of inorganics naturally present in surface soil, subsurface soil, and groundwater.

The results of this background sampling program indicated detectable concentrations of various inorganic analytes in the aforementioned media.

2.5.3 Surface Soil

Surface soil sampling was conducted at Site 2 to determine the nature and extent of contamination at the site, and to assess whether or not surface soil could potentially serve as an exposure pathway to human or ecological receptors. Arsenic and beryllium detections were identified as exceeding chemical specific criteria in the FS.

Arsenic was detected in six of six Site 2 surface soil samples at concentrations ranging from 0.82 to 3.95 mg/kg. The maximum detected concentration exceeded the default industrial Florida Soil Cleanup Target Level (SCTL) of 3.7 mg/kg and the background screening concentration of 3.2 mg/kg, but was less than the FDEP approved site-specific cleanup goal of 4.62 mg/kg (HLA, 1998c).

Beryllium was detected in four of six surface soil samples with a maximum concentration of 0.45 mg/kg which is slightly above the background concentration of 0.36 mg/kg. However, all the detections of beryllium were below USEPA Region III risk based concentration (RBC) and the Florida soil cleanup target levels.

2.5.4 Subsurface Soil

Subsurface soil sampling was conducted at Site 2 to determine the vertical extent of contamination, and to assess whether or not subsurface soil could potentially serve as an exposure pathway to human or ecological receptors.

The analytes detected in six subsurface soil samples collected at Site 2 were compared to the USEPA Region III RBCs and Florida SCTLs for industrial sites. No exceedances were noted.

2.5.5 Groundwater

Groundwater at NAS Whiting Field has been identified as a separate site (Site 40). It is being investigated and remediated separately from Site 2 and will be addressed in a separate ROD.

2.5.6 Migration Pathways

Arsenic and beryllium detected in Site 2 soil are the primary contaminants of concern at Site 2. The primary agents of migration acting on soil include wind, water, and human activity. Soil can also act as a source medium, allowing the chemicals of potential concern (CPCs) to be transported to other media.

Transport of the CPCs from soil via wind is not expected to be a major transport mechanism due to the presence of heavy vegetation at Site 2. Vegetative cover is an effective means of limiting wind erosion of soil.

Humans are effective at moving soil and can greatly affect the transport of soil-bound chemicals at hazardous waste sites. Under the current use of Site 2, human activity is not a major transport mechanism for the CPCs in soils. This condition could change based on the future use of Site 2.

Water can cause the transport of soil and, therefore, arsenic and beryllium in soil, via the mechanisms of physical transport of soil or the leaching of constituents from the soil to groundwater. Soil erosion, the physical transport of soil via surface water runoff, is currently not considered a major mechanism for the transport of the CPCs in soil at Site 2 because of (1) the low grade (slope) of the land surface at the site, (2) the heavy vegetation at the site, and (3) the nature of the constituents remaining in the soil at the site.

During the period of reported active disposal at the Site 2, from 1976 to 1984, the potential for physical transport of both soil and arsenic via runoff could have been a potentially significant mechanism for transport. If pits were excavated into the soil and waste materials were dumped into the pits, heavy precipitation events could have easily moved the unvegetated soil around the pits. Additionally, the possibility exists that the pits overflowed during heavy rain storms, because they were not covered during their operation. The pits are presumed to be backfilled following their periods of use, and the area revegetated. No significant transport of surface soil is expected since the revegetation of the Site 2 area.

Arsenic in the soil at Site 2 is likely to remain attached to the soil because most metal analytes adsorb readily to or are natural constituents of clays and other minerals.

2.6 SUMMARY OF SITE RISKS.

A risk assessment was completed for Site 2 to predict whether or not the site would pose current or future threats to human health or the environment, given the implementation of LUCs. Both a human health risk assessment (HHRA) and an ecological risk assessment (ERA) were performed for Site 2. The risk assessments evaluated the contaminants detected in site media during the RI and provided the basis for selecting the RAs.

2.6.1 Human Health Risk Assessment

An HHRA was conducted to characterize the risks associated with potential exposures to site-related contaminants at Site 2 for human receptors. The HHRA is provided as Chapter 6.0 of the RI report (HLA, 1998a) with supporting documentation provided in Appendix C.

Five components of the HHRA were completed, including (1) data evaluation, (2) selection of human health CPCs, (3) exposure assessment, (4) toxicity assessment, and (5) risk characterization.

Data Evaluation. The data evaluation involved numerous activities, including sorting data by media, evaluating analytical methods, evaluating quantitation limits, evaluating quality of data with respect to qualifiers and codes, evaluating tentatively identified compounds, comparing potentially site-related contamination with background, developing a data set for use in risk assessment, and identifying CPCs.

Human Health CPCs. Table 2-2 summarizes the human health CPCs selected for surface soil and groundwater at Site 2. These chemicals are the focus of the baseline risk assessment.

Exposure Assessment. Site 2 was evaluated to identify the populations potentially coming into contact with site-related chemicals and the pathways through which exposure might occur.

There are three potential media that may be sources of human exposure: surface soil, subsurface soil, and groundwater. Under current land use, there is no exposure to groundwater or subsurface soil. For future land use, it is assumed all three media are potential sources of exposure. Exposure assessments for the three potential media are described below.

**Table 2-2
Summary of Human Health Chemicals of Potential Concern**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Environmental Media	HHCCPs
Surface Soil	VOCs: None SVOCs: None Pesticides and PCBs: None Inorganic Analytes: Arsenic
Subsurface Soil	VOCs: None SVOCs: None Pesticides and PCBs: None Inorganic Analytes: None
Notes: VOC = volatile organic compound. SVOC = semivolatile organic compound. PCB = polychlorinated biphenyl.	

Surface Soil No humans currently reside or work at Site 2. Currently, there are no plans for residential development. However, Site 2 may eventually be developed for residential land use; therefore, the residential receptor was evaluated as part of the potential future land-use scenario. Since there are no buildings present at the site, exposure of occupational workers was only considered as part of the future land-use scenario. Other possible future exposure scenarios included excavation activities, such as installation of utility lines, and site maintenance, such as mowing the grass. Site maintenance activities may also include occasional silviculture activities by a forestry worker.

- **Subsurface Soil** There are no current exposures to subsurface soil because no excavation or construction activities are ongoing at Site 2. However, if Site 2 is developed for residential or industrial use or if excavation activities occur in the future, an excavation worker could be exposed to contaminants in subsurface soil.
- **Groundwater** Currently, groundwater at Site 2 is not used for any potable or nonpotable purpose. However, in the event Site 2 or areas hydraulically downgradient of Site 2 are developed for residential use, the exposure pathway to chemicals in groundwater could become complete. Therefore, hypothetical future domestic use of the surficial aquifer (adult and child ingestion) was evaluated in this HHRA as a worst-case estimate of potential future receptors (i.e., future potential worker scenarios were not evaluated).

Toxicity Assessment. The toxicity assessment is a two-step process whereby the potential hazards associated with the route-specific exposure to a given chemical are (1) identified by reviewing relevant human and animal studies, and (2) quantified through analysis of dose-response relationships. USEPA has calculated numerous toxicity values that have undergone extensive review within the scientific community. These values (published in the Integrated Risk Information System and other journals) are used in the baseline evaluation to calculate both carcinogenic and noncarcinogenic risks associated with each CPC and rate of exposure.

Risk Characterization. In the final step of the risk assessment, the results of the exposure and toxicity assessments are combined to estimate the overall risk from exposure to site contamination. For cancer-causing chemicals, risk is estimated to be a probability. For example, a particular exposure to chemicals at a site may present a 1 in 1,000,000 (or 1×10^{-6}) chance of development of cancer over an estimated lifetime of 70 years. For noncancer-causing chemicals, the dose of a chemical for which a receptor may be exposed is estimated and compared to the reference dose (RfD). The RfD is developed by USEPA scientists and represents an estimate of the amount of a chemical a person (including the most sensitive persons) could be exposed to over a lifetime without developing adverse effects. The measure of the likelihood of adverse effects other than cancer occurring in humans is called the hazard index (HI). An HI greater than 1 suggests that adverse effects are possible.

Table 2-3 provides a summary of the predicted risks for current exposure scenarios, and Table 2-4 provides a summary of the predicted risks for future exposure scenarios.

2.6.2 Ecological Risk Assessment (ERA)

The purpose of the ERA for Site 2 was to evaluate the potential for adverse effects to ecological receptors at the Northwest Open Disposal Area. Components of the ERA include (1) site characterization, (2) hazard assessment and contaminants of potential concern, (3) exposure assessment, (4) effects assessment, and (5) risk characterization. Table 2-5 provides a summary of the CPCs selected for Site 2 to be evaluated for each medium.

**Table 2-3
Risk Summary Current Land Use**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station, Whiting Field
Milton, Florida

Land Use	Exposure Route	HI	ELCR
Current Land Use			
Surface Soil:			
Adult Trespasser:	Incidental ingestion	0.002	4x10 ⁻⁷
	Dermal contact	0.0002	6x10 ⁻⁷
	Inhalation of particulates	ND	9x10 ⁻¹¹
Total Adult Trespasser:		0.003	1x10 ⁻⁶
Adolescent Trespasser:	Incidental ingestion	0.004	3x10 ⁻⁷
	Dermal contact	0.0003	4x10 ⁻⁷
	Inhalation of particulates	ND	5x10 ⁻¹¹
Total Adolescent Trespasser:		0.004	7x10 ⁻⁷
Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:		NC	2x10 ⁻⁶
Site Maintenance Worker:	Incidental ingestion	0.001	3x10 ⁻⁷
	Dermal contact	0.0002	5x10 ⁻⁷
	Inhalation of particulates	ND	1x10 ⁻¹⁰
Total Site Maintenance Worker:		0.001	8x10 ⁻⁷
Notes: HI = hazard index. ELCR = excess lifetime cancer risk. ND = no dose-response data for this exposure route were available for human health chemicals of potential concern in this medium. NC = not calculated because child and adult HIs are not additive.			

**Table 2-4
Risk Summary Future Land Use**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station, Whiting Field
Milton, Florida

Land Use	Exposure Route	HI	ELCR
Future Land Use			
Surface Soil:			
Adult Trespasser:	Incidental ingestion	0.002	4x10 ⁻⁷
	Dermal contact	0.0002	6x10 ⁻⁷
	Inhalation of particulates	ND	9x10 ⁻¹¹
	Total Adult Trespasser:	0.003	1x10 ⁻⁶
Adolescent Trespasser:	Incidental ingestion	0.004	3x10 ⁻⁷
	Dermal contact	0.0003	4x10 ⁻⁷
	Inhalation of particulates	ND	5x10 ⁻¹¹
	Total Adolescent Trespasser:	0.004	7x10 ⁻⁷
Total Risk to Trespasser (Adult and Adolescent) Exposed to Surface Soil:		NC	2x10 ⁻⁶
Adult Resident:	Incidental ingestion	0.02	4x10 ⁻⁶
	Dermal contact	0.002	5x10 ⁻⁶
	Inhalation of particulates	ND	3x10 ⁻⁹
	Total Adult Resident:	0.02	9x10 ⁻⁶
Child Resident:	Incidental ingestion	0.2	9x10 ⁻⁶
	Dermal contact	0.003	2x10 ⁻⁶
	Inhalation of particulates	ND	4x10 ⁻⁹
	Total Child Resident:	0.2	1x10 ⁻⁵
Total Risk to Resident (Adult and Child) Exposed to Surface Soil:		NC	2x10 ⁻⁵
Occupational Worker:	Incidental ingestion	0.006	1x10 ⁻⁶
	Dermal contact	0.001	2x10 ⁻⁶
	Inhalation of particulates	ND	1x10 ⁻⁹
	Total Occupational Worker:	0.007	3x10 ⁻⁶
Site Maintenance Worker:	Incidental ingestion	0.001	3x10 ⁻⁷
	Dermal contact	0.0002	5x10 ⁻⁷
	Inhalation of particulates	ND	1x10 ⁻¹⁰
	Total Site Maintenance Worker:	0.001	8x10 ⁻⁷
Excavation Worker:	Incidental ingestion	0.007	5x10 ⁻⁸
	Dermal contact	0.0002	6x10 ⁻¹⁰
	Inhalation of particulates	ND	2x10 ⁻¹⁴
	Total Excavation Worker:	0.008	5x10 ⁻⁸
Notes: HI = hazard index. - ELCR = excess lifetime cancer risk. NC = not calculated because child and adult HIs are not additive. ND = no dose-response data for this exposure route were available for HHCPs in this medium.			

**Table 2-5
Summary of Ecological Chemicals of Potential Concern (ECPCs)**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station, Whiting Field
Milton, Florida

Environmental Medium	ECPCs
Surface Soil	VOCs: Chloroform (total) SVOCs: bis(2-Ethylhexyl)phthalate Pesticides and PCBs: None Inorganic Analytes: Beryllium, vanadium
Notes: VOC = volatile organic compound. SVOC = semivolatile organic compound.	

The ERA completed for Site 2 considered exposure of terrestrial plants, terrestrial invertebrates, and wildlife to chemicals in surface soil at the site.

Two inorganic analytes detected in surface soil, vanadium and beryllium, may have potential adverse effects for plants at Site 2. Background screening concentrations of vanadium, similar to site-related concentrations, exceeded its phytotoxicity benchmark. Beryllium did not exceed its phytotoxicity benchmark value. Based on the relative low confidence of the vanadium screening value, exceedances of the phytotoxicity screening value by concentrations of vanadium detected in both background and site-related surface soil, and the lack of observable symptoms of vanadium toxicity at Site 2, risks to terrestrial plants are not predicted.

One VOC, chloroform, and one SVOC, *bis*(2-Ethylhexyl)phthalate, detected in surface soil may have potential adverse effects for invertebrates at Site 2. Neither analyte exceeded its invertebrate toxicity benchmark value. There are no available invertebrate toxicity benchmark values for beryllium and vanadium. Although these values are not available for beryllium and vanadium, qualitative evaluation of site-specific concentrations to background values suggests that the concentrations are similar. Therefore, it is unlikely that terrestrial invertebrates are at risk from exposure to ECPCs detected in Site 2 surface soil, and adverse effects to these receptors are not predicted. Consequently, no RAOs were established for terrestrial plant exposure to surface soil at Site 2 .

All lethal and sublethal Hazard Quotients and Hazard Indices for the representative wildlife species are less than 1, and risks associated with exposure to maximum detected concentrations of ECPCs in Site 2 surface soil are not predicted. Therefore, lethal effects to wildlife receptors are unlikely at Site 2, and sublethal effects to wildlife receptors are unlikely to result in adverse effects to reproduction and survival.

2.6.3 Risk Summary

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

2.7 DESCRIPTION OF ALTERNATIVES.

Three remedial alternatives were considered for Site 2. Cleanup alternatives were developed by the Navy, the USEPA, and the FDEP. The three alternatives are listed below and summarized on Table 2-6.

Alternative 1: No Action.

Alternative 2: LUCs.

Alternative 3: Capping and LUCs.

These alternatives were developed in consideration of site risks, the predicted future land use, and USEPA guidance for conducting RI/FS at landfill sites. All the alternatives include a provision for five-year site reviews to verify that the selected alternative is protective of human health and the environment in future years.

Alternative 1: The No Action alternative is required by CERCLA as a baseline for comparison with the other alternatives.

Alternative 2: LUCs were considered because site risks, future land-use concerns, and the site-specific cleanup target level for arsenic would be addressed by LUCs.

Alternative 3: Capping and LUCs were considered because it is the presumptive remedy for landfills as per the USEPA guidance document for conducting an RI/FS at municipal landfill sites. This guidance also

**Table 2-6
Summary of Remedial Alternatives Evaluated for Site 2**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station, Whiting Field
Milton, Florida

Alternative	Description of Key Components	Cost (Present Worth)	Duration ¹
Alternative 1: No Action	No remedial actions are taken at Site 2. 5-year site reviews.	\$23,000	30 Years+
Alternative 2: Land-Use Controls	Implementation of Land-Use Controls. MOA including LUCIP (Appendix B), documents created to maintain the site for nonresidential purposes. 5-year site reviews.	\$193,000	30 Years+
Alternative 3: Capping and Land-Use Controls	Development of a closure plan for site monitoring (includes visual observation as well as sample collection and analysis) and maintenance. Posting of warning signs Removal and disposal of surface debris Site clearing and grubbing. Placement of compacted soil cover. Vegetative support layer and vegetative cover. Soil cover maintenance. Implementation of Land-Use Controls. MOA, including LUCIP, documents created to maintain the site for nonresidential purposes. 5-year site reviews.	\$4,341,700	30 Years+

¹ A period of 30 years was chosen for present worth costing purposes only. Under Comprehensive Environmental Response, Compensation, and Liability Act, remedial actions must continue as long as hazardous substances, pollutants, or contaminants remain at the site.

Notes: MOA = Memorandum of Agreement.
LUCIP = Land-Use Control Implementation Plan.

suggests treatment alternatives would not be a major component of a remedial alternative at a landfill site where the presumptive remedy was implemented. It suggests treatment would only be considered for areas of high levels of contamination (i.e., hot spot areas). Because no hot spots were identified at Site 2, treatment alternatives were not considered. Under Alternative 3, a cover system would be constructed over the former landfill to reduce the infiltration of precipitation, control surface water run-on and runoff, and minimize potential direct contact risks. Reduction of infiltrating precipitation and surface water reduces contaminant leaching from soil and landfill wastes to groundwater. Surface water runoff controls would also be included to minimize erosion. In addition, LUCs and 5-year reviews would be implemented as in Alternative 2.

2.8 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES.

In selecting the preferred alternative for Site 2, nine criteria were used to evaluate the alternatives developed in the FS. The first seven are technical criteria based on the degree of protection of the environment, cost, and engineering feasibility

issues. The alternatives were further evaluated based on the final two criteria: acceptance by the USEPA and FDEP, and acceptance by the community. The nine criteria are (1) overall protection of human health and the environment, (2) compliance with ARARs, (3) long-term effectiveness, (4) reduction of toxicity, mobility, and volume, (5) short-term effectiveness, (6) implementability, (7) cost, (8) federal and state acceptance, and (9) community acceptance. These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The USEPA requires the alternative implemented must satisfy the threshold criteria. Primary balancing criteria weigh the major tradeoffs among alternatives. Modifying criteria are considered after public comment.

A summary of the ARARs applicable to Site 2 are presented in section 2.10. The State of Florida Contaminant Cleanup Target Levels are considered chemical-specific ARARs. Certain action-specific ARARs include permit requirements. Under CERCLA Section 121(e), permits are not required for remedial actions conducted entirely on site at Superfund sites. This permit exemption applies to all administrative requirements, including approval of or consultation with administrative bodies, documentation, record keeping, and enforcement. However, the substantive requirements of these ARARs must be attained. The action-specific ARARs are presented in Section 2.10.

Based on the evaluation of the alternatives against these criteria, Alternative 2 was selected as the preferred alternative for Site 2. The following subsections discuss the three alternatives relative to the nine criteria.

2.8.1 Threshold Criteria

Overall Protection of Human Health and the Environment. Alternative 1 would provide no form of protection to human receptors who may be exposed to soils at Site 2. If this alternative were selected, 5-year site reviews would be instituted. No adverse short-term or cross-media effects are anticipated with this no-action alternative.

Human receptors, namely residents, would be protected if Alternative 2 were implemented. Regulatory controls (i.e., LUCs) would prohibit potential future residents from exposure to the site because residential use of the site would be restricted under the proposed LUCs. However, this alternative would not provide protection for ecological receptors at the site. By implementing this alternative, no adverse short-term or cross-media effects are anticipated.

Implementation of Alternative 3 would provide the highest standard of protection to human receptors, in that a landfill cover and regulatory controls (i.e., LUCs) would prohibit potential human receptors from coming

into contact with the soils at Site 2. This alternative would also provide protection for ecological receptors at the site; however, in doing so, this alternative may alter the native ecological habitat present at the site.

Compliance with ARARs. Alternative 1, No Action, does not comply with the chemical specific ARARs in the short term. Thus this alternative will not comply with the ARARs.

Alternative 2 provides a means of continued protection of human health and the environment because it includes LUCs. In this manner, Alternative 2 will achieve the RAOs established for the site and would also therefore achieve ARARs.

Alternative 3, Capping and LUCs, would also achieve the RAOs and meet ARARs. However, Alternative 3 would adversely affect the existing environment at the site. Implementation of this alternative has potential for short-term effects of exposure to site workers.

2.8.2 Primary Balancing Criteria

Long-Term Effectiveness and Permanence. Human risks due to exposure to site soils would not be addressed if Alternative 1 were implemented. Administrative actions proposed in this alternative (e.g., 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative, but would not provide a permanent remedy for the site.

Risks presented to the future resident based on exposure to surface soil at the site would be addressed via the LUCs provided in Alternative 2. The long-term effectiveness and permanence of these controls would be controlled by the facility under the MOA (including LUCIP) documents being developed for NAS Whiting Field. Administrative actions proposed in Alternative 2 (e.g., LUCs and 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative. These administrative actions are considered to be reliable controls, as long as the facility maintains its MOA.

Implementation of Alternative 3 would include clearing and grubbing vegetation currently existing on the landfills. Existing vegetation would be removed, and ecological diversity would be reduced at Site 2. This ecological loss is not permanent; new vegetation would be planted on the final cover. However, this new vegetation would consist of mostly grasses and small brush, which are not as diverse as the natural vegetation currently existing. The clearing and grubbing of the existing vegetation can be viewed as a permanent long-term ecological impact.

Short-Term Effectiveness. Alternative 1 would not reduce human health risks in the short term because no land-use restrictions would be implemented.

Alternative 2 would reduce human health risks in the short term by reducing the potential exposure to Site 2 soils by human receptors. However, ecological receptors would not be affected by the implementation of this alternative.

If Alternative 3 were implemented, fugitive dust would be generated during the clearing, grubbing, and grading of the site. This dust may contain hazardous particulates posing an inhalation risk to human receptors. Dust suppression by the use of water trucks and hoses is included in this alternative to minimize these potential short-term risks.

Alternative 3 would include clearing and grubbing vegetation currently existing at the site. Both human health and ecological impacts would occur.

- Site workers would be exposed to increased risks by dermal contact, ingestion, and inhalation during construction activities. Appropriate personal protective equipment can be used to minimize this increased risk.
- Ecological species depending upon the surface of the landfills for food and other natural resources would be impacted by the removal of existing vegetation. This unavoidable construction item, an adverse short-term impact, would be reversed upon the growth of new vegetation. Construction operations are expected to last for 2 to 3 months, and new vegetation would likely require years to mature. Thus, the short-term ecological impacts as a result of clearing and grubbing the site may be significant.

Implementability. Alternatives 1 and 2 do not require remedial construction for implementation. Other activities, such as LUCs and 5-year site reviews, are easily implemented for both scenarios.

Equipment and materials are readily available to construct the cover designed for Alternative 3. Site work would be completed within a 3-month period, and would require standard construction expertise. Because of the difficulty in obtaining borrow soil in the vicinity of the site, soil would be obtained from a nonlocal borrow source. The lack of local borrow sources would result in additional transportation cost, but does not render the alternative infeasible.

Reduction of Toxicity, Mobility, and Volume of Contaminants through Treatment. Alternatives 1 and 2 would not provide a reduction in contaminant mobility or volume because no active mitigation of contaminant mobility or reduction in volume is proposed. No treatment residuals would be produced if either alternative were implemented.

Alternative 3 does not include treatment of contaminants, and does not physically or chemically alter contaminants contained in the landfills. Thus, this alternative does not reduce the toxicity, mobility, and/or volume of contaminants through treatment. However, the cover design would effectively reduce the mobility of contaminants contained in surface soil by preventing the spread of wind-blown particulates and by limiting infiltration. The cover would also prevent the uptake of contaminants contained in surface soil, which would prevent biomagnification of contaminants through the local ecological food chain.

Cost. The total present-worth cost of the three alternatives is presented below.

Alternative	O&M Costs	Capital Costs
Alternative 1: No Action	\$23,000	\$0
Alternative 2: LUC	\$193,000	\$0
Alternative 3: Capping and LUCs	\$193,000	\$4,148,700

2.8.3 Modifying Criteria

State and Federal Acceptance. The FDEP and USEPA have concurred with the Navy's selection of Alternative 2 as the preferred alternative.

Community Acceptance. Community acceptance of the preferred alternative will be evaluated at the end of the public comment period. The comments received during this period will be addressed in a Responsiveness Summary included in Appendix A.

2.9 SELECTED ALTERNATIVE.

Of the three alternatives evaluated, the selected RA for Site 2 is Alternative 2. Alternative 2 consists of LUCs and 5-year site reviews. The LUCs will establish restrictions that limit land use at the site to nonresidential uses. These restrictions will be incorporated into a legally binding LUC agreement. The 5-year site reviews will verify that the selected alternative is protective of human health and the environment in future years. The total cost of Alternative 2 is \$193,000 over a 30-year period. If this alternative were implemented, and the controls were maintained, predicted site risks would be minimized.

2.10 STATUTORY STATEMENT.

The alternative selected for implementation at Site 2 is consistent with the Navy's IR program, CERCLA, and the NCP. The selected remedy is protective of human health and the environment. The selected remedy does not satisfy the statutory preference for treatment because it allows hazardous substances in concentrations above health based levels to remain on site. However, the selected remedy does address the principal threat because it limits human exposure to contaminated soils through LUCs. Table 2-7 summarizes the comparison of the selected remedy to the nine criteria. Table 2-8 provides a summary of ARARs specific to the selected remedy.

Because Alternative 2 would result in hazardous substances remaining on site, a review would be conducted within 5 years after commencement of the RA to ensure the remedy continues to provide adequate protection of human health and the environment.

2.11 DOCUMENTATION OF SIGNIFICANT CHANGES.

There are no significant changes in the selected alternative described in the Proposed Plan.

**Table 2-7
Comparison of Selected Remedy with Nine Evaluation Criteria**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Evaluation Criteria	Assessment
Overall Protection of Human Health and the Environment	<p>Human receptors, namely residents, would be protected if this alternative were implemented. Regulatory controls (i.e., LUCs) would prohibit potential future residents from exposure to the site because residential use of the site would be restricted under the proposed LUCs. However, this alternative would not provide protection for ecological receptors at the site.</p> <p>By implementing this alternative, no adverse short-term or cross-media effects are anticipated.</p>
Compliance with ARARs	This alternative would comply with chemical-specific ARARs or TBCs for soil.
Long-Term Effectiveness	<p>The risks presented to the future resident based on exposure to surface soil at the site would be addressed via the LUCs. The long-term effectiveness and permanence of these controls will be controlled by the installation under the MOA developed for NAS Whiting Field.</p> <p>Administrative actions proposed in this alternative (e.g., LUCs and 5-year site reviews) would provide a means of evaluating the effectiveness of the alternative. These administrative actions are considered to be reliable controls, as long as the facility maintains its MOA.</p>
Reduction of Toxicity, Mobility, and Volume	This alternative would not provide a reduction in contaminant mobility or volume because no active mitigation of contaminants or reduction in volume is proposed. No treatment residuals would be produced if this alternative were implemented.
Short-Term Effectiveness	<p>This alternative would reduce human health risks in the short term by reducing the potential exposure to Site 2 soils by human receptors. However, ecological receptors would not be protected by the implementation of this alternative.</p> <p>This alternative does not pose a threat to workers through exposure to contaminated soils because only limited remedial construction activities (e.g., posting signs) are proposed under this alternative.</p>
Implementability	This alternative does not require remedial construction for implementation. Other activities, such as LUCs and 5-year site reviews, are easily implemented.
Cost	The total present worth cost of Alternative 2 is \$193,000.
Federal and State Acceptance	The USEPA and FDEP have concurred with the selected remedy.
Community Acceptance	The community has been given the opportunity to review and comment on the selected remedy. Comments received were addressed (see Appendix A) and did not alter the selected remedy proposed in the Proposed Plan.
<p>Notes: LUC = land-use control. ARAR = applicable or relevant and appropriate requirement. TBC = to be considered. MOA = Memorandum of Agreement. NAS = Naval Air Station. USEPA = U.S. Environmental Protection Agency. FDEP = Florida Department of Environmental Protection.</p>	

**Table 2-8
Summary of Federal and State ARARs and Guidance Specific to Alternative 2**

Record of Decision
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida

Name and Regulatory Citation	Description	Consideration in the Remedial Action Process	Type
Occupational Safety and Health Act (29 Code of Federal Regulations [CFR] Part 1910)	Requires establishment of programs to ensure worker health and safety at hazardous waste sites.	Applicable. These requirements apply to response activities conducted in accordance with the National Contingency Plan. During the implementation of any remedial alternative for Site 2, these regulations must be attained.	Action-specific
Florida Hazardous Waste Rules (Chapter 62-730, Florida Administrative Code [FAC])	Adopts by reference, specific sections of the Federal hazardous waste regulations, including the section regulating hazardous waste landfills (40 CFR, Part 264, Subpart N) and makes additions to these regulations.	Relevant and Appropriate. These regulations are not applicable to Site 2 because they apply only to landfills receiving waste after 1983; however, the requirements may be used as guidance for developing a landfill inspection program.	Action-specific
Florida Contaminant Target Cleanup Levels (Chapter 62-777, FAC)	Provides contaminant cleanup target levels.	Relevant and Appropriate. Considered because these default levels represent the FDEP's most current derivation of target levels.	Chemical-specific
Resource Conservation and Recovery Act (RCRA) Regulations, Landban (40 CFR, Part 264, 268)	Provide removal and disposal requirements for landfills that contain hazardous waste.	Relevant and Appropriate. These regulations are not applicable to Site 2 because they apply only to landfills receiving waste after 1980; however, the requirements may be used as guidance for developing a landfill inspection program and in the event soils are moved from the landfill.	Action-specific
<p>Notes: ARAR = applicable or relevant and appropriate requirement. FDEP = Florida Department of Environmental Protection.</p>			

REFERENCES

- Envirodyne Engineers. 1985. *Initial Assessment Study, NAS Whiting Field, Milton, Florida, Final Report*. Prepared for Naval Energy and Environmental Support Activity, Port Hueneme, California.
- Florida Department of Environmental Protection, 1998. Letter dated April 27, 1998. Response to letter report by Navy.
- Florida Administrative Code Chapter 62-777. 1999. *Florida Contaminant Target Cleanup Levels*. (August).
- Harding Lawson Associates, Inc. (HLA). 1998a. *Remedial Investigation for Site 2, Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFAC-ENGCOM, North Charleston, South Carolina.
- HLA. 1998b. *Feasibility Study for Site 2 Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina.
- HLA. 1998c. *Request for Arsenic Variance for Surface Soils at Covered Landfill Sites, Naval Air Station Whiting Field, Milton, Florida*. Letter Report Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina.
- HLA. 1999. *Proposed Plan for Site 2 Northwest Open Disposal Area Naval Air Station Whiting Field, Milton, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.
- U.S. Environmental Protection Agency (USEPA). 1993. *Presumptive Remedy for Comprehensive Environmental Response, Compensation, and Liability (CERCLA) Municipal Landfill Sites*. Office of Solid Waste and Emergency Response (OSWER) directive 9355.0-049FS.

APPENDIX A
COMMUNITY RELATIONS
RESPONSIVENESS SUMMARY

**Responsiveness Summary
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida**

A public comment period on the Site 2 Proposed Plan was held from April 9 to May 10, 1999. Two public comments were received during that period. The comments are summarized below, and responses are provided.

Comment: The Site 2 Proposed Plan did not address whether or not Clear Creek surface water had been studied. If so, the results of these studies should be made available for review before the final response action decision for Site 2.

Response: The Site 2 Proposed Plan addresses proposed response actions at that site (the Northwest Open Disposal Area) only.

The Clear Creek floodplain has been designated as Site 39 in the NAS Whiting Field Installation Restoration program. Field studies at this site have been conducted and are summarized in the following reports:

- Remedial Investigation/Feasibility Study Technical Memorandum No. 4, Surface Water and Sediment Assessment + Phase 1 (May 1992)
- Clear Creek Floodplain Investigation (July 1993)
- Ecological Trip Report for Clear Creek Floodplain (January 1994)
- These reports are available for public review at the NAS Whiting Field Information Repository in the West Florida Regional Library, 805 Alabama Street, Milton, Florida. Also, as noted in the Site 2 Proposed Plan, a basewide groundwater investigation is currently underway at NAS Whiting Field. This study will also assess potential impacts on Clear Creek from groundwater discharge.

Comment: Notice of the public information session regarding the Site 2 Proposed Plan should have been made in a timely fashion. The commenter received notice of the information session after the session took place.

Response: Notice of the public information session and availability of the Proposed Plan and Remedial Investigation and Feasibility Study reports for Site 2 was published in the *Pensacola News-Journal* on April 9, 1999. Publication of the notice was in accordance with USEPA guidance that states the agency (the Navy in this case) must publish this notice in a major local newspaper of general circulation.

As suggested by the comment, future notices will be published in a major local newspaper at least one week prior to public meetings.

APPENDIX B

LAND-USE CONTROL IMPLEMENTATION PLAN

**Land-Use Control Implementation Plan
Site 2, Northwest Open Disposal Area
Naval Air Station Whiting Field
Milton, Florida**

Site Description: Site 2, the Northwest Open Disposal Area, is an old borrow pit that is currently a surface depression. The relief at the site is approximately 25 feet. The site is currently covered with dense, low-lying vegetation. Some wood debris is located in the center portion of the site.

Site 2 was used as an open disposal area primarily for construction and demolition debris from 1976 until 1984. Wastes disposed of at the site include asphalt, wood, tires, furniture, and similar materials that were not suitable for landfill disposal. Crushed paint cans and scrap metal parts have been scattered throughout the site.

Site Location: Site 2 is located west of the North Air Field at NAS Whiting Field, along the northwestern boundary of NAS Whiting Field. The installation and site locations are shown on Figures 1-1 and 1-2 in the Remedial Investigation Report for Site 2, Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida (HLA, 1998).

Land Use Control (LUC) Objective: Land use at Site 2 is to remain non-residential. The FDEP and USEPA have concurred with this use at the site given the following conditions (FDEP, 1998):

1. The sites may be utilized for activities that involve less than full-time contact with the site. This may include, but is not limited to, a) parks, b) recreation areas that receive heavy use (such as soccer or baseball fields), or c) agricultural sites where farming practices result in moderate site contact (approximately 100 days per year or less).
2. The Navy must ensure adherence to the land use by incorporating the site and restricted use conditions in a legally binding LUC agreement.
3. The above soil cleanup goal shall not be utilized at any other site without specific FDEP approval.

No further investigation of the soil under the Comprehensive Environmental Restoration Compensation and Liability Act (CERCLA) is warranted under non-residential site usage.

The LUC is based on the detection of arsenic in surface soil samples at concentrations exceeding residential and industrial soil cleanup target levels established as guidance criteria by Chapter 62-777, F.A.C. (FDEP, 1999). Arsenic present at these concentrations could result in a total excess lifetime cancer risk of 2×10^{-5} by a hypothetical future resident, 2×10^{-6} for current and future site trespassers, and 3×10^{-6} by an occupational worker through the ingestion of surface soil. These risk levels exceed the FDEP target risk level of 1×10^{-6} .

LUC Implemented to Achieve Objective(s): Notation in the NAS Whiting Field geographic information system will include a designation of industrial use only at Site 2 and quarterly inspections will be conducted to confirm conformance with the industrial land use.

Under CERCLA, the Site 2 Proposed Plan and Record of Decision mandate initial implementation and continued application of appropriate restrictions on future usage of the property encompassing Site 2 while it is owned by the Federal government. The LUC will apply until or unless site remediation is conducted to restore the site for unrestricted use.

Decision Documents: Below are the Site 2 decision documents.

Envirodyne Engineers, Inc. 1985. Initial Assessment Study, Naval Air Station Whiting Field, Milton, Florida. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina.

Harding Lawson Associates (HLA), 1998. Remedial Investigation for Site 2, Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

ABB Environmental Services, 1998 Remedial Investigation and Feasibility Study, General Information Report, Naval Air Station Whiting Field, Milton, Florida. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

Florida Department of Environmental Protection, 1998. Letter dated April 27, 1998. Response to letter report by Navy.

Florida Department of Environmental Protection, August, 1999. Chapter 62-777, F.A.C.

HLA, 1998. Feasibility Study for Site 2, Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

HLA, 1998. Proposed Plan for Site 2, Northwest Open Disposal Area, Naval Air Station Whiting Field, Milton, Florida. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

Other Pertinent Information: Groundwater contamination beneath Site 2 will be addressed under Site 40, Basewide Groundwater investigation.

Under the memorandum of agreement for land use controls there are no stipulations precluding the use of the aquifer. However, because of the proximity to other industrial sites, and the detection of aluminum and iron at concentration exceeding Federal and State maximum contaminant levels, it would not be advisable or prudent to use the resource as a potable or non-potable water supply. The Site 40 Basewide Groundwater investigation, in progress, should be reviewed prior to considering use, if any of groundwater beneath Site 2.

A feasibility study was recommended to address the concentrations of arsenic detected in surface soil samples during the remedial investigation study for Site 2 (HLA, 1998).