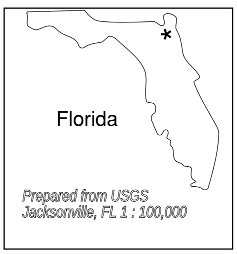
Naval Air Station Cecil Field

Jacksonville, Florida
Region 4
FL5170022474

Site Exposure Potential

The Naval Air Station (NAS) Cecil Field occupies 8,094 hectares, approximately 22 km southwest of Jacksonville, Florida (Figure 1). NAS Cecil Field was constructed in 1941 and currently supports the operation and maintenance of naval weapons and aircraft under the command of the Sea Strike Wings Atlantic. The site comprises four separate facilities: the main station (Cecil Field), the Outlying Field Whitehouse, and the Yellow Water Weapons Department and the Pinecastle Warfare Range, which are outside the area shown in Figure 1. The area surrounding these facilities is rural and land use is primarily for forestry and agriculture (Brown and Caldwell 1989).



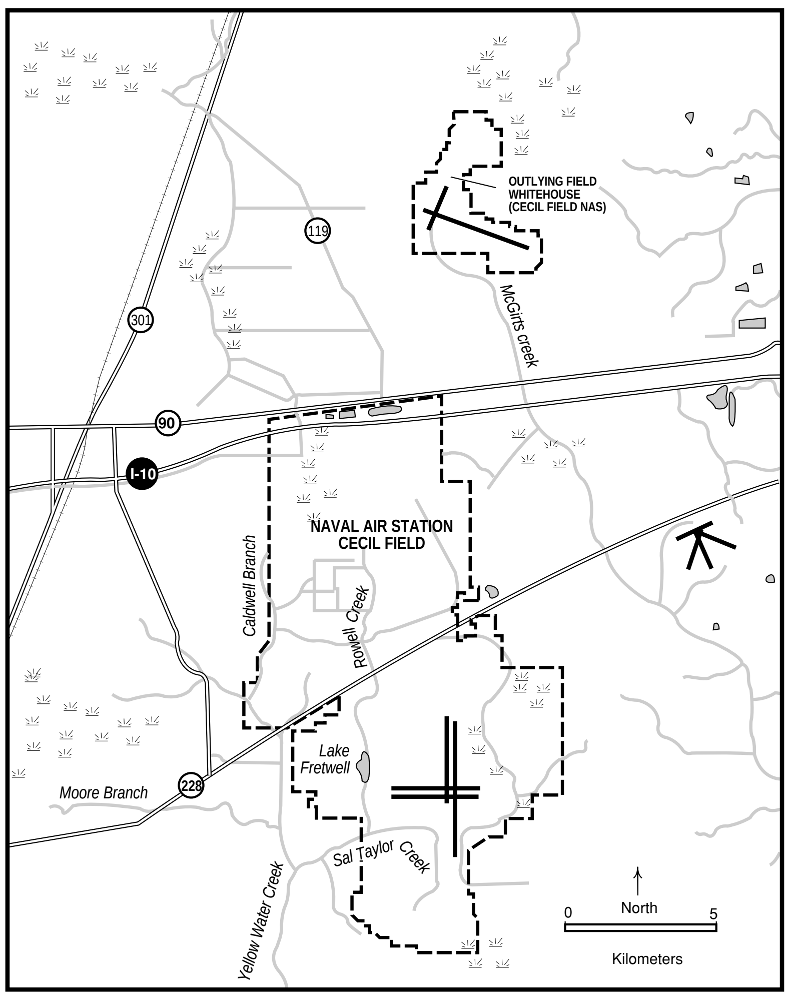


Figure 1.
Naval Air Station
Cecil Field,
Jacksonville, Florida.

Site Exposure Potential, *cont.*

A variety of wastes have been generated as a result of activities at NAS Cecil Field. Oils, fuels, solvents, paints and thinners, pesticides, and sewage sludge have been buried or burned at two on-site landfills and fourteen disposal areas. In addition, three sites have been used for ordnance disposal. Handling, storage, and disposal practices of these materials have contributed to contamination of groundwater, soil, and sediment at NAS Cecil Field.

Surface water runoff from the site is conveyed to local streams, including Yellow Water Creek, Rowell Creek, and Sal Taylor Creek, by a system of storm sewers and unlined ditches. The confluence of Rowell and Sal Taylor creeks lies on the western edge of the main station boundary. Sal Taylor continues southwest for 3 km before meeting Yellow Water Creek, the receiving stream of all surface waters leaving the site. Yellow Water Creek flows south from the Sal Taylor Creek tributary for 13 km to join Black Creek. Black Creek then flows southeast for 27 km to the St. Johns River, which drains to the Atlantic Ocean. The distance from the NAS Cecil Field to the St. Johns River is about 40 km.

Three groundwater aquifers underlie the Cecil Field site: the surficial aquifer, the secondary artesian aquifer, and the Floridan aquifer. The surficial aquifer is very shallow and exists in unconsolidated sand. This aquifer discharges to surface water bodies and is the primary source of base flow for many streams in the area. The other aquifers are much deeper and are isolated from the surficial aquifer by low permeability geological features.

Both surface water and groundwater movement represent potential pathways of contamination from NAS Cecil Field to nearby streams. The majority of the contaminated areas identified at Cecil Field are close to Rowell Creek and Lake Fretwell. Both of these surface waters serve as the receiving points for groundwater discharge and surface water flow emanating from the sites. Known sites of contamination are also situated along the other creeks.

Site-Related Contamination

Only contaminants at the main station of NAS Cecil Field and the Yellow Water Weapons Department have been investi-

Site-Related Contamination, *cont.*

gated to date and are addressed here (Brown and Caldwell 1989). Preliminary data indicate contaminated groundwater, surface water, soil, and sediment (Table 1; Brown and Caldwell 1989). The major contaminants of concern are cadmium, chromium, lead, and mercury, which were detected in groundwater at high concentrations. Groundwater from the landfills had some of the highest concentrations, and the most frequent occurrences of trace elements. Surface water collected from a rubble disposal area had high concentrations of mercury. Soil and sediment from a number of areas showed elevated concentrations of cadmium and lead. Low levels of

Table 1. Maximum concentrations of major contaminants in the vicinity of the site compared with applicable screening levels.

	Water			Soil		Sediment	
	Ground-water µg/l	Surface Water µg/l	AWQC[1] µg/l	Soil mg/kg	Average[2] U.S. Soil mg/kg	Sediment mg/kg	ER-L[3] mg/kg
INORGANIC SUBSTANCES							
cadmium	12	ND	1.1+	17	0.06	20	5
chromium	425	ND	11	16	100	9	80
lead	573	ND	3.2+	599	10	14	35
mercury	0.8	0.3	0.012	NT	0.03	NT	0.15
ORGANIC COMPOUNDS							
PCBs	NT	NT	0.014	0.58	NA	ND	0.05

1: Ambient water quality criteria for the protection of aquatic organisms. Freshwater chronic criteria presented (EPA 1986).
2: Lindsay (1979)
3: Effective range-low; the concentration representing the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and Morgan (1990).
+ Hardness-dependent criteria; 100 mg/l $CaCO_3$ used.
NT Not analyzed
ND Not detected at method detection limit, detection limit not available

volatile organic and semi-volatile organic compounds were detected in groundwater and soil sampled from a number of areas.

NOAA Trust Habitats and Species

Black Creek and the St. Johns River support numerous habitats for marine, estuarine, and anadromous fish and invertebrates, including several commercially important species and one endangered species (Table 2; Brown and Caldwell 1989; Wodall personal communication 1990). It is not known to what extent these species utilize the tributary streams leading from the site to Black Creek. Striped bass and blue crab spawn throughout Black Creek. The West Indian manatee, a

NOAA Trust Habitats and Species, *cont.*

federally endangered species, occurs in the St. Johns River and has been reported in Black Creek on several occasions, as far upstream as Middleburg, 16 km upstream of the site.

Table 2. Species and habitat use of Black Creek and the lower St. Johns River estuary.

Table available in hardcopy

Black Creek is a very popular area for recreational fisheries and water-related sports, including swimming, boating, and water skiing. Recreational fisheries in the creek include those for blue crab, striped bass, and red drum. Blue crab are also fished commercially in Black Creek and eels are fished commercially in its lower reaches near the St. Johns River.

The lower St. Johns River near the confluence of Black Creek is tidally influenced and provides estuarine habitat for many marine and estuarine species, including nursery grounds for shrimp, spotted seatrout, weakfish, spot, Atlantic croaker, and red drum (Brown and Caldwell 1989; Wodall personal communication 1990).

References

Brown and Caldwell. 1989. Naval Air Station, Cecil Field, Jacksonville, Florida. Draft Final RI/FS Work Plan. Charleston, South Carolina: Department of the Navy, Southern Division, Naval Facilities Engineering Command.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York: John Wiley & Sons. 449pp.

Long, E.R., and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA-52. Seattle: Coastal and Estuarine Assessment Branch, NOAA. 175 pp.+ Appendices.

U.S. Environmental Protection Agency. 1986. Quality Criteria for Water. Washington, D.C.: Office of Water Regulations and Standards, Criteria and Standards Division. EPA 440/5-86-001.

Wodall, S., Environmental Investigator, Lake City Regional Office, Florida Fish and Game Commission, Lake City, Florida, personal communication, June 28, 1990.