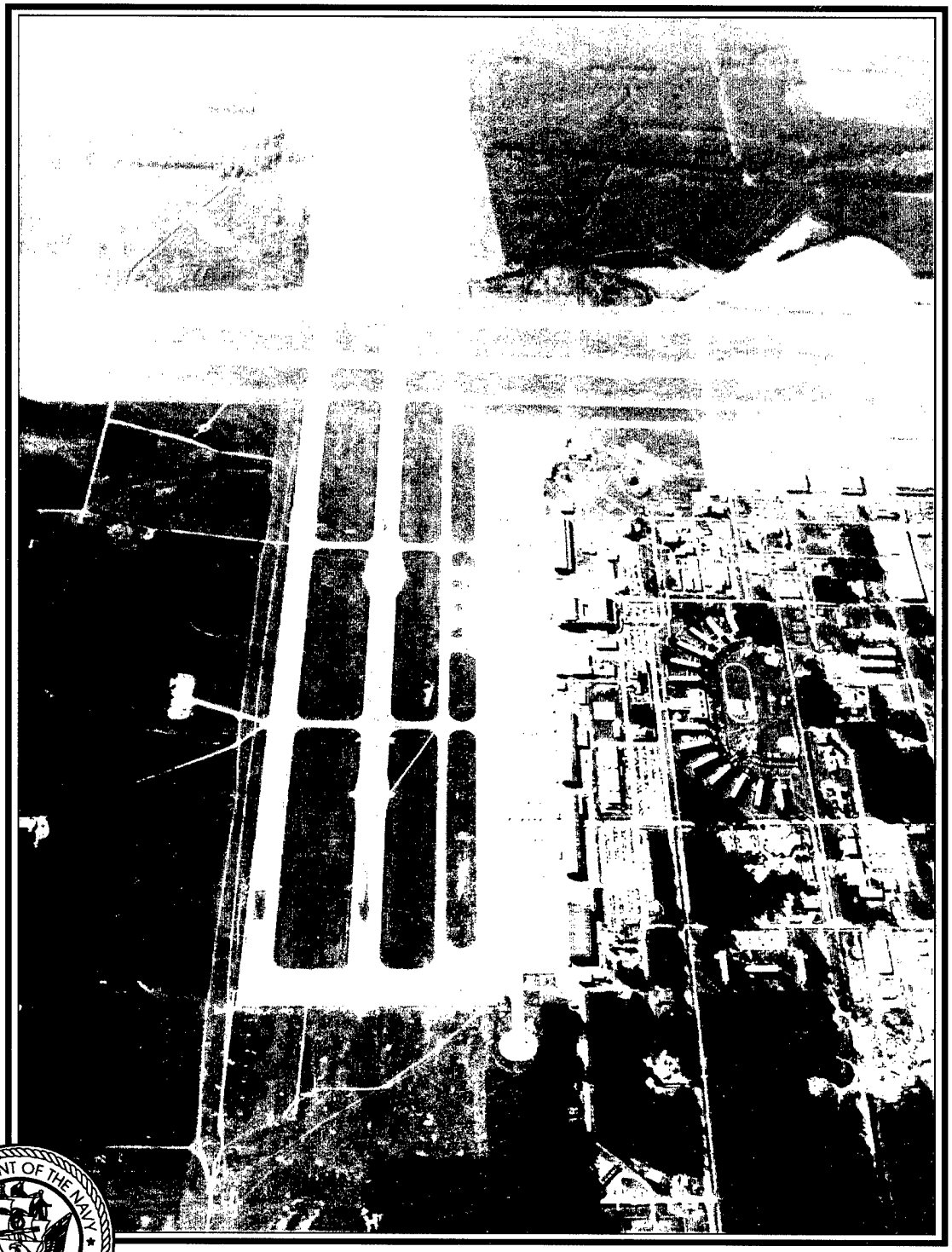
Draft Environmental Impact Statement
Disposal and Reuse of Naval Air Station Cecil Field
Jacksonville, Florida



U.S. Department of the Navy **April 1997**

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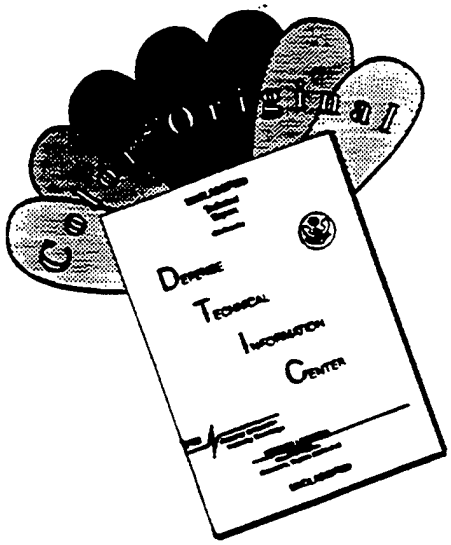

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April 23, 1997

For Public Distribution:

Pursuant the National Environmental Policy Act (NEPA), the Department of the Navy filed a Draft Environmental Impact Statement (DEIS) with the U.S. Environmental Protection Agency on April 17, 1997, that evaluates the proposed disposal and reuse of Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, which will be closed pursuant to the mandates of the Base Closure and Realignment Act. A Notice of Availability (NOA) for the DEIS will be published in the *Federal Register* on April 25, 1997. This notice will initiate a 45-day public comment period on the DEIS. Enclosed is a copy of the DEIS for your review.

Interested parties and agencies are invited to comment on the DEIS. Written comments may be mailed or sent by facsimile to the address listed below. Comments must be postmarked, if mailed, or received, if sent by facsimile, by June 10, 1997 to be considered part of the public record.

The Navy will hold a public hearing to receive comments on the DEIS on May 27, 1997 at 7:00 p.m. in the Main Drill Hall at the Post of Snyder, Florida Army National Guard Center, 9900 Normandy Boulevard, Jacksonville, Florida.

All written and oral comments received on the DEIS at the hearing and during the 45-day comment period will be considered in a Final Environmental Impact Statement (FEIS) to be prepared by the Navy.

All written comments should be forwarded to the following address:

Commanding Officer
Southern Division, Naval Facilities Engineering Command
Attn: Mr. Robert Teague, P.E. (Code 064)
2155 Eagle Drive
P.O. Box 190010
North Charleston, SC 29419-9010

Phone: 803/820-5785
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Draft Environmental Impact Statement
Disposal and Reuse of
Naval Air Station Cecil Field
Jacksonville, Florida

April 1997

Lead Agency:	U.S. Department of Navy
Title of Proposed Action:	Disposal of Surplus Property and Subsequent Reuse of Naval Air Station Cecil Field
Affected Jurisdiction:	City of Jacksonville, Duval County, and Clay County

In accordance with the 1993 Base Closure and Realignment Commission mandates, Naval Air Station (NAS) Cecil Field will be closed. The proposed action, as addressed by this Draft Environmental Impact Statement (DEIS), is the disposal and reuse of NAS Cecil Field. This DEIS includes an analysis of the potential impacts that the proposed Alternative Reuse Scenarios may have on the local community including land use and aesthetics, terrestrial and aquatic environment, water quality, wetlands, transportation, air quality, noise, socioeconomics, infrastructure, community services, cultural resources, and environmental contamination.

Beneficial impacts associated with implementation of the Preferred Reuse Plan would include the creation/retention of employment and increased availability of recreational facilities. Potential adverse environmental impacts would include minor impacts to wetlands, threatened and endangered species, traffic, and air quality. Mitigation measures can be employed to reduce potential impacts to insignificant or acceptable levels. Remediation of environmental contamination will continue to be the responsibility of the Navy.

For further information, contact:

Commander, Southern Division
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2155 Eagle Drive, P.O. Box 190010
North Charleston, SC 29419-9010
Attn: Robert Teague (803/820-5785)

Executive Summary

As a result of the 1993 mandates of the Defense Base Closure and Realignment Commission (Commission), as approved by Congress pursuant to the Defense Base Closure and Realignment Act of 1990 (commonly referred to as BRAC), Naval Air Station (NAS) Cecil Field, located in Duval and Clay counties, Florida, will be closed.

The United States Department of the Navy has prepared this Draft Environmental Impact Statement (DEIS) to evaluate the potential environmental effects of disposal and reuse of the station by other entities pursuant to the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996), prepared by the Cecil Field Development Commission (CFDC).

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality Regulations on Implementing NEPA Procedures (40 CFR 1500-1508); OPNAVINST 5090.1B; and the Defense Base Closure and Realignment Act of 1990 (Title XXIX of P.L. 101-510) as amended by PL 102-190 and P.L. 102-484.

ES.1 Purpose and Need

Closure of NAS Cecil Field was mandated by BRAC for the purpose of reducing the military infrastructure and saving operation and maintenance costs over the long term. Disposal of the property is necessary so that the Navy does not continue to incur operation and maintenance costs for the facility after it has closed. Operational closure of NAS Cecil Field is scheduled to occur by August 1999.

NAS Cecil Field land holdings encompass approximately 31,366 acres of owned/leased property and lands with easement controls within the following areas (Navy 1988; Nelson 1994):

- The Main Station, which is composed of approximately 9,516 acres of Navy-owned, leased, and easement land, generally located south of Normandy Boulevard (Duval County Route 228);

- The Yellow Water Area, which is composed of approximately 8,091 acres of Navy-owned land, generally located north of Normandy Boulevard;

- The station's Outlying Landing Field (OLF) Whitehouse, which is composed of approximately 2,565 acres of Navy-owned and easement land, located 7 miles north of the Main Station at the termination of Halsema Road;

- The Pinecastle Target Complex, located 90 miles south of Jacksonville in Lake, Marion, Putnam, and Clay counties, encompassing a total of approximately 11,142 acres of Navy-owned, leased, and easement land in four outlying target ranges; and

- Other outlying sites totaling approximately 52 acres, including the Tactical Aircrew Training System (TACTS) area, consisting of overwater areas and transmitting towers for simulated air-to-air combat training.

This DEIS only addresses the environmental effects of reuse of station properties to be disposed by the Navy, which comprise approximately 17,202 acres of land at the Main Station and Yellow Water area. Properties at or operated by NAS Cecil Field that the Navy will retain include: OLF Whitehouse; the Yellow Water Family Housing Area (200 units located on 252 acres in the southwestern portion of the Yellow Water area); the Pinecastle Target Complex; and the TACTS area.

ES.2 Alternatives

The CFDC formally adopted the *NAS Cecil Field Final Base Reuse Plan* in March 1996 (CFDC 1996). In accordance with federal regulations, this plan is considered the proposed action (i.e., Preferred Reuse Plan) for this DEIS.

A major element of the Base Reuse Plan process was the development of a series of alternative reuse scenarios (ARSs) for the station. Following an analysis of the market potential for redevelopment of the station property, requests for land/facilities from various entities, and an assessment of existing development opportunities and physical development constraints (e.g., wetlands, significant habitat, contaminated sites, etc.), the CFDC generated the Preferred Reuse Plan and a series of four ARSs that tested broad concepts for redevelopment.

Proposed Action (Preferred Reuse Plan)

The Preferred Reuse Plan corresponds to the "Aviation Mixed Use" concept discussed is the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, portions of NAS Cecil Field not conveyed to other agencies would be aggressively marketed for redevelopment for aviation and other industrial and commercial uses. Job creation would be the primary goal, and significant infrastructure and road improvements would be implemented to foster development.

The future land use plan under the Preferred Reuse Plan would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian and military use. It is anticipated that some facilities would be used to accommodate helicopter units. Additional land at the Main Station would also be retained for future airport expansion and managed as forestry resources in the interim. The NAS Cecil Field golf course and other recreational lands on the Main Station (e.g., Lake Fretwell) and portions of the Yellow Water Area would be reused for passive and active parks and recreational facilities as well as equestrian uses. The balance of the property would be developed for a variety of industrial and commercial uses. Within the developed area of the Main Station, a significant amount of demolition would potentially occur to clear large areas for redevelopment of heavy industrial uses such as assembly shops for automotive and aviation parts (CFDC 1996).

The Preferred Reuse Plan also supports the preservation of a natural corridor throughout the station on the lands that are not best suited for new development, including stream corridors, wetlands, and floodplain areas. This concept would support the creation of a 20-mile long corridor between the Cary State Forest and the Jennings State Forest. A full description of the Preferred Reuse Plan is provided in Section 2.2.3 of this DEIS.

Alternative Reuse Scenario 1

ARS 1 corresponds to the "Continued Public Ownership" concept discussed is the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, the local community would have land use and regulatory control over the site but would not be directly involved with the redevelopment of the NAS Cecil Field property. Reuse of the majority of the property would primarily involve various uses such as recreation/forestry, helicopter operations, and parks and recreation. The small balance of the property would be used by private interests for market-driven development.

The future land use plan under ARS 1 would involve the reuse of existing buildings in the developed area of the Main Station by other entities. Selected aviation facilities and office/personnel space at the Main Station would likely be used to support helicopter operations. The NAS Cecil Field golf course and other recreational lands on the Main Station would be reused for parks and recreation areas open to the general public. All other lands and buildings in the developed portion of the Main Station would be used by private interests for market-driven development, primarily office and industrial uses that would be able to capitalize on the reuse of existing facilities. The balance of the property, consisting of all of the station's several thousand acres of planted pine forest, would be managed as a resource-based recreational facility. A full description of ARS 1 is provided in Section 2.2.4 of this DEIS.

Alternative Reuse Scenario 2

ARS 2 corresponds to the "Local Asset Management" concept discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, only moderate actions would be taken to stimulate new development at the site. Redevelopment efforts would focus on the developed area of the Main Station to identify new users of existing facilities. The Yellow Water Area would not realize new development other than market-driven development around previously disturbed ordnance storage areas.

The future land use plan under ARS 2 would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian and military use. ARS 2 includes the reuse of recreational facilities by the general public.

The balance of the property would be used by private land interests for market-driven development. This property would be controlled by local zoning. New development would only be focused on lands south of 103rd Street on the Main Station and former ordnance storage areas in the Yellow Water Area to take advantage of existing infrastructure facilities (i.e., roads, sewer, electric, etc.). Other lands on the Main Station and Yellow Water Area would be zoned to be consistent with land west of the site (i.e., forestry). A full description of ARS 2 is provided in Section 2.2.5 of this DEIS.

Alternative Reuse Scenario 3

ARS 3 corresponds to the "Non-Aviation Mixed Use" discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFOC 1996). Under this plan, the ultimate receiving entity

would aggressively market and guide redevelopment of the station property for non-aviation use. All aviation facilities would be either renovated for non-aviation use or razed.

The future land use plan for ARS 3 would include the development of a variety of residential, commercial, and industrial uses. Land in the eastern portion of the Main Station would be utilized for a new planned residential community. Land south of Normandy Boulevard and north of 103rd Street would be developed for commercial uses to support this residential community. Land in the eastern and northern portions of the Yellow Water Area would be developed for light industrial facilities. Land in the western portion of both the Main Station and Yellow Water Area would be developed for manufacturing uses. Finally, the southern portion of the Main Station would be reserved for conservation and mitigation areas to compensate for proposed development in other areas of the station.

The developed area of the Main Station would be developed into a large-scale business park or business incubator development, and existing buildings and roads would be reused to the greatest extent practicable. A full description of ARS 3 is provided in Section 2.2.6 of this DEIS.

Alternative Reuse Scenario 4

ARS 4 corresponds to an earlier version of the CFDC's Final Reuse Plan for the station that was subsequently amended in March of 1996 (CFDC 1996). Similar to the Preferred Reuse Plan, ARS 4 would involve aggressively marketing redevelopment of the station property for aviation and other industrial uses. The major difference between ARS 4 and the Preferred Reuse Plan would be the inclusion of two major new institutional facilities under ARS 4.

The future land use plan under ARS 4 would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian and military use. Anticipated aircraft operations would be similar to those under the Preferred Reuse Plan.

As under the other scenarios, the NAS Cecil Field golf course and other recreational lands on the Main Station and Yellow Water Area would be open for public use.

The two major institution uses would include:

- Land in the existing ordnance storage areas of the Yellow Water Area, as well as a buffer area surrounding this compound that would be used for the development of a new 5,000-bed state corrections facility; and

- Land and buildings in the southern portion of the Yellow Water Area that would be used for the development of a juvenile justice facility.

The balance of the property would be developed for a variety of industrial and commercial uses. Within the developed area of the Main Station, a significant amount of demolition would occur to clear large areas for the development of heavy industrial uses such as assembly shops for automotive and aviation parts. A full description of ARS 4 is provided in Section 2.2.7 of this DEIS.

ES.3 Summary of Environmental Impacts

The redevelopment and reuse of the property will be the responsibility of the ultimate receiving entity and individual project sponsors, not the Navy. As such, these entities along with local, state, and other federal agencies, will ultimately be responsible for ensuring that redevelopment occurs, appropriate permits and approvals are obtained, and suggested mitigation measures are implemented.

ES.3.1 Land Use and Aesthetics

Preferred Reuse Plan. Although significant areas of the station are constrained for future development activities by features such as wetlands and habitats of species of concern, the station still contains large parcels that could reasonably support new development. The CFDC projects that approximately 3.9 million square feet of new development could occur by 2010 under the Preferred Reuse Plan. However, permitted development on unconstrained land areas would total over 29 million square feet using the CFDC's Floor Area Ratio (FAR) standards. Therefore, projected development that could occur under the Preferred Reuse Plan could be implemented without significantly affecting constrained areas.

The proposed internal land use pattern represents a mixture of land uses which are generally compatible. Although proposed parks and recreation land use on the Main Station is ideal given the existing facilities, this activity is not entirely consistent with the proposed adjacent heavy industrial areas to the east and aviation related uses to the south. Other land uses are considered compatible with each other.

The Preferred Reuse Plan is generally compatible with the uses adjacent to NAS Cecil Field. The light industrial area that extends from the northern boundary of the Yellow Water Area south to Normandy Boulevard would be near mixed land uses including low-density residential, and commercial activities. Although light industrial uses adjacent to low-density

residential areas may be considered incompatible, the low FAR proposed in the plan and the preservation of natural surroundings would minimize this incompatibility. Other land uses are considered compatible with land uses external to NAS Cecil Field.

Overall, the redevelopment of NAS Cecil Field would influence the growth pattern in the southwest district of Jacksonville's urban service area by providing for a variety of commercial and industrial employment activities, rather than the singular use of the property as a military airfield.

Development of the Preferred Reuse Plan would change the aesthetic features of the property, but the overall character of the station would not change significantly. On the Main Station, the implementation of the plan would result in improvements to the aesthetic resources. As part of the plan, the less desirable and unusable structures and utilities would be removed, and many of the existing positive visual environments, such as the dominance of tall pine trees in the undeveloped areas and scattered in the developed areas, would remain to provide a unifying feature throughout the Main Station.

With the exceptions of a relatively small area and the munitions storage facilities, the Yellow Water Area consists primarily of forested areas and wetlands. Development of the site with heavy and light industrial activities would result in a slight degradation of the visual components of the natural setting. The aesthetic impacts to the Yellow Water Area would be offset through FAR controls, the designation of natural preservation of areas, establishment of buffers, landscaping, and sensitive design consideration in the siting of new industrial establishments.

ARS 1. Because development would be limited to currently developed areas of the Main Station, environmental features would not be significantly affected by this scenario. No significant internal land use inconsistencies would result from implementing this ARS based on the limited amount of development. However, while ARS 1 capitalizes on the forestry assets at the station, it does little to take advantage of the valuable aviation assets. However, there is a greater possibility for incompatible market-driven development on the Main Station. No significant external land use inconsistencies would result from implementing this plan.

Implementation of this ARS would result in short- and long-term aesthetic impacts in previously developed areas of the station. It is expected that existing buildings would deteriorate and only necessary maintenance of structures would occur as consistent with a caretaker approach (i.e., buildings awaiting reuse).

ARS 2. Environmental features would not significantly affect the implementation of ARS 2. The CFDC projects that approximately 500,000 square feet of new development could be realized under ARS 2 (CFDC 1996). However, development that would be allowed using FAR standards would total over 18 million square feet. Therefore, projected development could reasonably be implemented without affecting constrained land areas. Because new development would be very limited and center around already disturbed areas, it is unlikely that internal land use conflicts would result. No significant external land use inconsistencies would result from implementing ARS 2. However, based on the limited amount of proactive planning and development under ARS 2, there is a potential for the deterioration of existing facilities at the station after disposal.

ARS 3. While industrial and commercial development under ARS 3 would not be significantly affected by development constraints, the planned residential development would be impeded by environmental features at the station, if developed at the assumed density (i.e., one unit per 2 acres). Notwithstanding, it is likely that the residential development could be "clustered" into smaller sized lots of 1 acre or less to avoid constrained areas, while maintaining the same overall net yield of residential units.

Development under ARS 3 would not likely result in any significant internal land use conflicts. However, by introducing residential uses into the scenario, the potential exists for future conflicts with industrial and manufacturing uses, if these areas are not properly buffered from one another. Overall, ARS 3 takes the least advantage of existing assets at the station by complete discontinuation and redevelopment of aviation facilities and long-term development of all forestry resources. In turn, ARS 3 would involve the greatest amount of infrastructure investment to facilitate any development activities.

This ARS would result in limited conflicts with off-station land uses, and is consistent with mixed-use development goals established in the *Jacksonville Comprehensive Plan.* However, based on the limited amount of development in this section of the city, encouragement of such an extensive development outside the city's existing urban service area could have the potential for contributing to urban sprawl, altering the anticipated growth patterns in this section, and resulting in an unintended need for capital improvements and speculative land ventures. Aesthetic impacts would be similar to the impacts associated with the Preferred Reuse Plan.

ARS 4. Environmental features would not significantly affect the implementation of ARS 4. The internal land use consistency would be similar to the Preferred Reuse Plan. The major difference would involve proposed uses of the Yellow Water Area. Both the corrections and juvenile justice facilities would be adjacent to light industrial activities. This could result in potential land use conflicts depending on the type and intensity of industrial uses ultimately developed. However, given the FAR standards assumed under ARS 4, new industrial development could be controlled so that it does not adversely affect populations in the corrections or juvenile justice facilities.

The external land use consistency would be similar to the Preferred Reuse Plan. Aesthetic impacts would be similar to the Preferred Reuse Plan.

ES.3.2 Topography, Geology, and Soils

Preferred Reuse Plan. Implementation of the Preferred Reuse Plan would not adversely impact soils on the base property, but limited impacts would be associated with specific construction projects and result in soil compaction, rutting, and exposure to potential erosion. Impacts to soils would be restricted to the area of disturbance only, and would be minimized by the use of standard soil erosion and sedimentation control measures (i.e., hay bales, silt fences, etc.) during the construction phase of new projects. As this plan is implemented, site-specific analysis of soil conditions would be conducted in conjunction with the development of soil erosion and sedimentation control plans. Site-specific impacts to soils would be minimized by avoidance of areas where soils may present development constraints (i.e., where a high erosion potential exists).

ARS 1. Implementation of ARS 1 would result in similar impacts as discussed for the Preferred Reuse Plan.

ARS 2. Implementation of ARS 2 would result in similar impacts as discussed for the Preferred Reuse Plan.

ARS 3. Implementation of ARS 3 would result in similar impacts as discussed for the Preferred Reuse Plan.

ARS 4. Implementation of ARS 4 would result in similar impacts as discussed for the Preferred Reuse Plan.

ES.3.3 Terrestrial Resources

Preferred Reuse Plan. Implementation of the Preferred Reuse Plan would result in minor impacts to terrestrial resources in the short-term and interim time frame, and moderate impacts in the long-term time frame. The proposed long-term construction of heavy and light industrial developments and additional public buildings and facilities would require land clearing and vegetation removal. In general, these developments would directly impact vegetation and associated wildlife by removing habitats and fragmenting the remaining habitats, which would restrict potential wildlife movements among areas. However, the enforcement of FAR standards to control overall density of the developments would minimize impacts. Only a small portion of the total land set aside for a specific development project would actually be used; most would be maintained in its present ecological condition.

Based on the large extent of nonwetland area that could be developed and the limited amount of proposed development in the interim, it is unlikely that encroachment into wetlands would be required to accommodate development. As specific development plans are proposed near known wetland areas, wetland delineations will need to be conducted by the developer to determine specific wetland boundaries in relation to proposed developments and to ensure that wetland areas will be preserved and maintained.

Proposed long-term development could potentially impact suitable habitats and individual species of concern. However, the most intensive development would require relatively small areas; proper project siting could avoid suitable habitats. In general, most of the suitable habitat for species of concern occurs on the Main Station, whereas much of the long-term new development is planned to occur at the Yellow Water Area. Based on the presence of species of concern and suitable habitats at the station, developers would be required to conduct additional consultation with the US Fish and Wildlife Service (USFWS) and Florida Game and Fresh Water Fish Commission (FGFWFC) and/or additional surveys would likely be required prior to development.

ARS 1. Overall, ARS 1 would result in the fewest impacts to terrestrial resources (upland and wetland vegetation and wildlife) because of the minimal amount of redevelopment. Proposed development at the Main Station would occur within existing structures, aviation facilities including runways, other developed areas, and maintained lawn. Reuse of the ordnance storage facilities in the Yellow Water Area would not result in the use or disturbance of additional lands. The remaining lands, consisting of virtually all of the Yellow Water Area and most of the Main Station, would be used for passive recreation and forestry

purposes. The resultant extensive greenspace could serve as an important wildlife travel corridor between Cary State Forest, the Jennings State Forest, and Camp Blanding. Implementation of ARS 1 would not impact the present distribution of species of concern at the station or the suitability of habitats.

ARS 2. Implementation of ARS 2 would result in predominantly minor overall impacts to existing biological resources. Most of the station would be maintained in its present state for forestry purposes, existing facilities would continue to be used, and limited new development would occur in disturbed portions of the Main Station and Yellow Water Area.

ARS 2 would not result in encroachment on wetlands. The small amount of acreage required for development, compared to the overall size of the general area, would allow for the avoidance of wetland areas and prevent direct impacts to wetland resources.

Impacts to suitable habitats for species of concern would be similar to those resulting from current operations. The market driven development in the Yellow Water Area would result in the loss of suitable foraging habitat for the southeastern American kestrel. However, the actual area required for development compared to the areas that would remain undisturbed is minor.

ARS 3. Compared to the other ARSs, ARS 3 would result in a greater disturbance of upland habitats, wetland habitats, and suitable habitats for species of concern. In particular, direct impacts would occur to wetlands through possible hydrologic alterations, and indirect impacts could occur to wildlife through restricted movement and habitat fragmentation.

ARS 3 would result in widespread impacts to upland vegetation and wildlife, particularly at the Main Station. Residential development in the eastern part of the Main Station would cause the removal of much of the forest, thereby minimizing the value of this area to wildlife. It would encroach upon numerous acres of hardwood, cypress, and scrub/shrub wetlands in the eastern section of the Main Station. Manufacturing facilities, commercial development, and light industrial developments would constitute relatively intensive land uses and potentially cause the loss of more upland habitat than the other ARSs.

Most of the Yellow Water Area is designated for industrial and manufacturing activities. Over half of this area is mapped as wetland, and encroachment upon wetlands would occur despite the modest FARs. Creation of the conservation area on the Main Station would preserve some hardwood and pine wetlands.

ARS 3 would potentially result in the direct loss of much suitable habitat for several species of concern including the gopher tortoise, Florida mouse, eastern indigo snake, Sherman's fox squirrel, Florida pine snake, Bachman's sparrow, and numerous plant species in drier habitats, and possibly the wood stork in wetland areas. Proposed development on the Main Station would probably cause direct impact to individual gopher tortoises through mortality or significant alteration of occupied habitats. In addition, developments throughout the station would fragment suitable habitats, thereby restricting movement of most species of concern. Individuals that are not directly impacted would be isolated from other individuals, potentially resulting in significant impacts to the local population through decreased reproduction. The proposed conservation area south of the Main Station and adjacent to the Brannan Field Mitigation Bank would create a sizeable conservation area, and would somewhat offset overall impacts to species of concern.

ARS 4. Impacts resulting from the implementation of ARS 4 would be similar to the Preferred Reuse Plan.

ES.3.4 Water Quality and Hydrology

Preferred Reuse Plan. No significant impacts to surface water hydrology are anticipated from implementation of the Preferred Reuse Plan. No new realignment of streams or physical alteration of wetland systems is anticipated; therefore, no impacts to surface water flow patterns or reduction of flood retention capacity are anticipated. As new areas of the station are open for development, primarily in the Yellow Water Area, additional stormwater collection, conveyance and outfall systems will be required to be installed. Redevelopment would not result in a significant increase in stormwater runoff off site because appropriate stormwater management practices would be implemented.

Implementation of the Preferred Reuse Plan is unlikely to result in adverse effects to water quality. Eventual deactivation of the station's wastewater treatment plant (WWTP) would improve water quality through the elimination of effluent discharge and a reduction of nutrient loads to Rowell Creek. Potential surface water quality impacts may result from industrial stormwater discharge, or from normal maintenance and use of developed areas (e.g., herbicide and insecticide use, increased levels of oil and gas in stormwater runoff from roads and parking lots). Adverse impacts to surface water quality could potentially result from the various types of industrial uses through accidental or unpermitted discharges.

However, heavy industrial uses are anticipated to be in the form of clean modern manufacturing operations.

The Preferred Reuse Plan would not impact the availability of groundwater in the area or the quality of the water withdrawn. Little or no recharge of the Floridian aquifer occurs near NAS Cecil Field. An increase in impervious surface area resulting from development would not significantly decrease the amount of water recharged into the Floridian aquifer. Overall, implementation of the Preferred Reuse Plan and fulfillment of its associated consumptive use permits would not cause an exceedance of safe aquifer yields. Overall, remediation of contaminated groundwater areas will result in improvements to groundwater quality.

ARS 1. Implementation of ARS 1 would not result in any adverse impacts to surface water hydrology or flood retention capacity in the vicinity of the station because existing conditions would be maintained.

Implementation of ARS 1 would not result in any adverse impacts to water quality in the vicinity of the station. Eventual deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek, which will improve water quality. Forestry would continue to use best management practices, and proper erosion control measures to prevent the possibility of agriculture runoff would continue.

Implementation of ARS 1 would not result in any adverse impacts to the availability of groundwater in the area or the quality of water withdrawn because existing conditions would be essentially maintained. Remediation of contaminated groundwater areas identified will result in improvements to groundwater quality.

ARS 2. Based on the limited amount of new development planned, implementation of ARS 2 should not result in any adverse impacts to surface water hydrology or flood retention capacity in the vicinity of the station.

Implementation of ARS 2 would not result in any adverse impacts to water quality. Deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek, and it would ultimately result in improved water quality. Minor surface water quality impacts may occur from normal maintenance and use of developed areas, including herbicide and insecticide use, and oil and gas in stormwater runoff from roads, parking lots, and aviation areas. However, these effects would be less significant than under pre-closure conditions.

Implementation of ARS 2 would not result in any adverse impacts to the availability of groundwater in the area or the quality of water withdrawn. Fulfillment of consumptive-use permits will not cause an exceedance of safe aquifer yields. The remediation of contaminated groundwater areas will result in improvements to groundwater quality.

ARS 3. Implementation of ARS 3 would potentially impact the surface water hydrology and flood retention capacity on the station property. The development of large tracts of land for manufacturing/light industrial and planned residential projects would potentially result in realignment of streams or physical alteration of wetland systems. The significance of impacts from construction and operation of this scenario would depend on the final design. Depending on the extent of development, this scenario would most likely alter natural sheet flow and flow characteristics of streams as a result of the increase in impervious surface area.

Development of large tracts of land for manufacturing, light industrial, residential, and commercial projects may result in an increased use of pesticides, insecticides, or herbicides for lawn care, and increased levels of oil and gas in stormwater runoff from roads and parking lots. Furthermore, increased water flow intensity and sediment loads resulting from increased runoff velocity over impervious and newly cleared areas may occur from development of large tracks of land for industrial projects. Deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek and ultimately result in improved water quality.

Implementation of ARS 3 would not impact the availability of groundwater in the area. However, the Floridian aquifer system would not be affected because little or no recharge of significant groundwater occurs near the station. Fulfillment of consumptive-use permits will not cause an exceedance of safe aquifer yields. Remediation of contaminated groundwater areas identified will result in improvements to groundwater quality.

ARS 4. Implementation of ARS 4 would result in similar impacts as those discussed for the Preferred Reuse Plan.

ES.3.5 Climate and Air Quality

ES.3.5.1 Climate

Neither the Preferred Reuse nor any of the ARSs would have a significant impact on local or regional climate conditions.

ES.3.5.2 Air Quality

Preferred Reuse Plan. The primary air emission sources are expected to be aircraft, mobile source activity to and from the property, construction activities, and aircraft maintenance facilities.

Between pre-closure conditions and the completion of Phase 2 (2010), VOC emissions would decrease by 422 tons per year. Emissions of NO_x during the same period would decrease by 250 tons per year.

Annual emissions of CO would increase by 407 tons per year. Annual emissions of PM would increase by 82 tons per year. The increase in CO emissions is primarily a result of the increase in the vehicle miles traveled by employees at the facility. The increase in PM emissions is solely a result of the C & D projects associated with the Preferred Reuse Plan. Construction PM emissions would cease upon completion of the proposed facilities.

After the transfer, the Federal agency involved in the action does not retain authority to control air pollutant emissions associated with these lands, nor does it retain authority over any facilities developed or located on these lands. Thus, this action is exempt from the General Conformity Rule. Developers of future facilities are responsible for obtaining the proper permits prior to development. Major regulations that may apply are construction and operating permit procedures for stationary air pollution emitting sources and emission standards such as the New Source Performance Standards and control technology standards.

ARS 1. The primary air emission sources for ARS 1 are expected to be aircraft (helicopter use only) and mobile source activity to and from the former NAS Cecil Field. New stationary source emissions are anticipated to be minimal because no major facilities that emit air pollutants are planned for construction.

At the completion of Phase 2 (2010), a substantial decrease in emissions of all compounds is anticipated. As with the Preferred Reuse Plan, this action is exempt from the General Conformity Rule.

ARS 2. The primary air emission sources for ARS 2 are expected to be aircraft, mobile source activity to and from the former NAS Cecil Field, and C & D activities. Aircraft emissions for ARS 2 would be identical to those in the Preferred Reuse Plan because aircraft activity and type would be the same for both scenarios. Stationary source emissions are expected to be significantly lower compared to pre-closure levels.

Projected emissions decrease significantly from pre-closure conditions to completion of Phase 2 (2010). VOC emissions decrease by 491 tons per year; NO_X emissions decrease by 374 tons per year; and PM emissions decrease by 7 tons per year. CO emissions would decrease by 457 tons per year. As with the Preferred Reuse Plan, this action is exempt from the General Conformity Rule.

ARS 3. The primary air emission sources from ARS 3 are expected to be mobile source activity to and from the station and C & D activities. No aircraft activity is proposed. Stationary source emissions are expected to lower significantly compared to the existing condition.

Between pre-closure conditions and completion of Phase 2 (2010), annual emissions of VOCs would decrease 445 tons. NO_X emissions would increase by 118 tons annually. Annual emissions of CO would increase by 1,871 tons from pre-closure conditions to the completion of Phase 2. Annual PM emissions would increase by 1,029 tons from pre-closure conditions to the completion of Phase 2. The increase in CO emissions is primarily a result of the increase in the vehicle miles traveled by facility employees. The increase in emissions of PM is due solely to C & D projects.

ARS 4. The primary air emission sources are expected to be aircraft, mobile source activity to and from the former Cecil Field, construction activities, and the addition of a boiler plant for the proposed correctional facility. Aircraft emissions are projected to be the same under ARS 4 as in the Preferred Reuse Plan.

Annual emissions of VOCs and NO_X would decrease from pre-closure conditions to the completion of Phase 2 (2010): VOC emissions would decrease by 384 tons; NO_X emissions would decrease by 201 tons. Annual particulate emissions would increase by 82 tons. CO would increase by 706 tons. As with the Preferred Reuse Plan, this action is exempt from the General Conformity Rule. Developers of future facilities are responsible for obtaining the proper permits prior to development. Major regulations that may apply are construction and operating permit procedures for stationary air pollution emitting sources and emission standards such as the New Source Performance Standards and control technology standards.

ES.3.6 Noise

Preferred Reuse Plan. The most significant sources of noise resulting from implementation of the Preferred Reuse Plan are military and civilian aircraft operations. Other less significant noise sources include traffic, industrial operations, and C & D activities.

Projected L_{dn} contours for Phase 1 (2004) and Phase 2 (2010) of the redevelopment under the Preferred Reuse Plan are compared to pre-closure AICUZ noise contours. Projected noise exposure from aircraft operations at the station would be significantly less than under pre-closure conditions. This is primarily the result of the significant decrease in overall operations that will occur after the station closes and because aircraft training activities between NAS Cecil Field and OLF Whitehouse will no longer occur. In addition, the types of aircraft that would be used to conduct activities at the airfield after closure would have engine types that emit lower noise levels compared to the turbo jet engines used by Navy F/A-18 aircraft currently based at the station.

The 75 dB contour stays with the current station boundary and would not significantly affect on station land uses proposed under the Preferred Reuse Plan, as compared to pre-closure AICUZ noise contours. The projected 65 dB contour would extend beyond the current station boundaries; however, it would primarily affect lands devoted to forestry and conservation. No significant residential populations would be affected by projected noise contours under the Preferred Reuse Plan.

In addition to noise associated with aircraft operations, as implementation of the Preferred Reuse Plan progresses, it is anticipated that business establishments would begin to relocate to the station, resulting in long-term, gradual increases in ambient noise levels from other sources. These increases would be associated with both industrial operations and local traffic resulting from increased employment. In addition, future infrastructure and road improvements, as well as the demolition of station structures during redevelopment, would require the use of heavy construction machinery, resulting in short-term increases in ambient sound levels. Nevertheless, the absence of any concentrations of sensitive noise receptors (e.g., residential areas, hospitals, churches, etc.) in proximity to the station indicates that these effects would not be significant.

ARS 1. Under ARS 1, ambient noise levels in the vicinity of NAS Cecil Field would decrease from pre-closure conditions because of the cessation of fixed-wing aircraft operations. Other noise sources would also be significantly limited as the majority of the station would be reused for forestry and recreation.

Noise from aircraft sources would be limited to that associated with helicopter operations. Projected noise contours under this alternative would be significantly smaller than those under pre-closure conditions and the Preferred Reuse Plan.

The limited market-driven development and recreational facilities planned for the remainder of the site under ARS 1 are not expected to generate significant levels of ambient noise.

ARS 2. Noise impacts under ARS 2 would be similar to the Preferred Reuse Plan for aircraft sources and less significant for other noise sources.

Noise impacts resulting from aircraft operations would be similar to the Preferred Reuse Plan because the projected level of aircraft operations would be the same. Long-term noise levels resulting from other sources under ARS 2 would be slightly less than under the Preferred Reuse Plan because the alternative involves low levels of infrastructure and industrial development at the site.

ARS 3. ARS 3 would result in the greatest decrease in ambient noise levels from pre-closure levels because all aircraft operations at NAS Cecil Field would cease after closure.

Construction of residential, commercial, and industrial areas would result in short-term and minor increases in noise levels above background levels. Local traffic noise would also increase. However, long-term development under ARS 3 would present a greater potential of creating future noise conflicts with sensitive receptors by locating a large residential development in proximity of light industrial and manufacturing uses.

ARS 4. Noise impacts under ARS 4 would be similar to the Preferred Reuse Plan because the development patterns and aircraft operations are the same, with the exception of planned correctional and juvenile justice facilities under this alternative. Neither of these facilities would be a significant noise source.

ES.3.7 Socioeconomics and Community Resources

Preferred Reuse Plan. The Preferred Reuse Plan is projected to have only a minor impact on the population and demographics of Duval and Clay counties and on the Jacksonville MSA as a whole. A large portion of the jobs created under this plan are predicted to be filled by unemployed or underemployed residents currently living in the Jacksonville area, thus decreasing the incentive for new residents to relocate to the area.

A total of approximately 3,199 direct jobs and 3,528 indirect jobs are expected to be created by the implementation of this plan (The Arthur Andersen Group et al., n.d.). Additionally, it is anticipated that this plan would generate approximately $78 million in direct payroll and $67 million in indirect earnings. Implementation of the Preferred Reuse Plan is predicted to generate an estimated $2,164,758 annually in property tax revenues with the total assessed value of taxable property on the former Naval station reaching nearly $100 million (The Arthur Andersen Group et al., N.D.).

To implement the Preferred Reuse Plan, it is expected that $1.8 million to $4.1 million will be spent annually on operation and maintenance costs, and approximately $71.2 million on one-time capital costs. In addition, this plan would require that more than $173 million be spent on capital improvements by other government and private entities.

Implementation of the Preferred Reuse Plan would have no impact on the housing market in the City of Jacksonville or its surrounding communities compared to existing conditions, and only a minor impact on the provision of educational services in Clay and Duval counties. When the impacts of both closure and reuse are considered, the Preferred Reuse Plan may have a slight positive impact on the school systems in Duval County. The total number of school-aged children is expected to decline as a net result of closure and reuse. At the same time, property tax revenues in Duval County are expected to increase as the land previously owned by the Navy will become taxable.

The Preferred Reuse Plan is anticipated to have minor adverse impacts on provision of fire, police, and ambulance services in the City of Jacksonville. The transfer of NAS Cecil Field from Navy ownership to private or local government ownership would increase the area that will need to be serviced by local police, fire, and ambulance corps, and increase their manpower and equipment needs. The negative effects caused by the increase in the area served by local emergency services would be slightly offset by the transfer of all Naval public safety buildings and equipment (e.g., firehouses, police stations, vehicles) to the City of Jacksonville (CFDC 1996). In addition, implementation of the Preferred Reuse Plan would expand local government revenues through an increase in property tax collections. The additional property tax revenues in conjunction with the transfer of buildings and equipment should more than offset any financial burdens placed on the providers of emergency services.

Implementation of the Preferred Reuse Plan would positively impact the provision of recreational facilities in the Jacksonville area. Under this alternative, most of NAS Cecil Field's existing golf course, athletic fields, and other recreational facilities would continue to be used for these purposes and open to the public, thereby increasing the recreational facilities available to local residents.

ARS 1. Similar to the Preferred Reuse Plan, ARS 1 is anticipated to have very little impact on the population or demographic characteristics of Duval and Clay counties or the Jacksonville MSA as a whole. Based on the limited economic activity that is projected to occur as a result of the implementation of this alternative, ARS 1 is not expected to attract a significant number of new residents to the region. Approximately 666 direct and 640 indirect jobs are expected to be created by the business park users. Total direct payroll generated by the reuse of the site is expected to reach nearly $20 million, which will create an additional $13 million in indirect earnings in the regional economy. Annual property tax receipts from the former NAS Cecil Field are projected to reach $520,292, and the total assessed value of taxable property at the site is expected to reach $24 million under this alternative (The Arthur Andersen Group et al., n.d.).

The total capital costs expected to be incurred for redevelopment of the former NAS Cecil Field is estimated to be approximately $13.1 million, and the annual operating and maintenance costs are expected to range between $1.8 million and $4.1 million under ARS 1 (The Arthur Andersen Group et al., n.d.).

ARS 1 is not anticipated to have a significant impact on the regional housing market in the Jacksonville MSA. Because this alternative would create only a small number of jobs and would not induce any changes in the size of the regional population, the demand for housing would not be affected. Educational service impacts associated with the implementation of ARS 1 would be similar to those caused by the Preferred Reuse Plan, although the change in population and the increase in property tax revenues would be lower under this alternative than under the Preferred Reuse Plan.

The impacts to emergency and medical services associated with ARS 1 would be similar to those described for the Preferred Reuse Plan. Of all of the alternatives considered, ARS 1 would have the most positive impact on the provision of recreational facilities. This alternative would increase the amount of active and passive recreational land available in Jacksonville.

ARS 2. ARS 2 is projected to have only a minor impact on the demographic and population characteristics of Duval and Clay counties and on the Jacksonville MSA as a whole. A total of 1,266 direct jobs and 1,534 indirect jobs are expected to be created by implementing this alternative (The Arthur Andersen Group et al., n.d.).

Implementation of ARS 2 is expected to generate approximately $41 million in direct payroll and $32 million in indirect income throughout the regional economy. Following implementation of ARS 2, annual property tax revenues generated at the site are projected to reach $639,958, the total assessed value of taxable property at the former NAS Cecil Field is anticipated to reach approximately $29.5 million (The Arthur Andersen Group et al., n.d.). Annual operations and maintenance costs associated with this alternative are expected to range from $1.8 million to $4.1 million, while total capital costs are predicted to be approximately $13.4 million. An additional $3.3 million for capital improvements is also predicted to be incurred by other entities associated with the development of specific projects (The Arthur Andersen Group et al., n.d.).

Implementation of ARS 2 is not expected to have a significant impact on the housing market in the Jacksonville MSA. Educational service impacts associated with the implementation of ARS 2 would be similar to those caused by the Preferred Reuse Plan, although the change in population and the increase in property tax would be less than for the Preferred Reuse Plan. ARS 2 is expected to affect the provision of emergency and medical services in a similar manner as described for the Preferred Reuse Plan. However, the area dedicated recreational facilities under this alternative would be slightly smaller than the area utilized for ARS 1.

ARS 3. Implementation of ARS 3 is expected to have a moderate impact on the population and demographic characteristics of the area immediately adjacent to the former Naval station, but only a minor impact on the Jacksonville MSA as a whole.
As a result of the residential development, the population on the former NAS Cecil Field would increase by 3,250 households, or by an estimated 8,255 persons. These additional residents would have a moderate impact on the demographic characteristics of the communities in the surrounding area. This localized impact would be lessened to some extent because the construction and occupation of these housing units would be dispersed over a 12-year period.

Regionally, ARS 3 would have only a minor impact on the population and demographic characteristics of the Jacksonville MSA. Implementation of this scenario is projected to create approximately 2,550 direct jobs and 2,190 indirect jobs in the Jacksonville area (The Arthur Andersen Group et al., n.d.).

As a direct result of ARS 3, approximately $53 million in payroll is predicted to be generated by industries/employers located at the former NAS Cecil Field. The indirect income that would be generated by this alternative is expected to reach slightly more than $41

million. ARS 3 would generate approximately $7,520,376 in property tax revenues annually after its implementation. The proposed residential community is expected to supply approximately $5.7 million in annual property tax revenues or more than 75% of the total property taxes generated annually under this alternative. Total assessed value of taxable property on the former Naval station is predicted to reach more than $430 million. The costs to implement this alternative include annual operating and maintenance costs ranging from $1.8 million to $4.1 million, and one-time capital costs of approximately $57 million. Costs that will be incurred by other agencies are expected to reach $170.8 million under this alternative.

ARS 3 is expected to have a moderate impact on the regional housing market in the Jacksonville MSA. If implemented, ARS 3 would include the development of approximately 3,250 housing units at the former station, which would have an impact on the regional housing supply. The change in demand for housing is not expected to be as great as the change in supply of housing; therefore, implementation of ARS 3 may actually cause a decrease in the price of housing in the region. ARS 3 would significantly affect the schools located in the immediate vicinity of the former Naval station. This residential development would dramatically increase the number of students who would attend nearby schools. Although the overall enrollment in the Duval County School District is not expected to expand, specific schools in the district would be heavily impacted.

The impacts to emergency and medical services associated with implementing ARS 3 would be similar to those described for the Preferred Reuse Plan. The impacts to recreation associated with implementing ARS 3 would be similar to those described for the Preferred Reuse Plan.

ARS 4. ARS 4 is projected to have only a minor impact on the population and demographics of Duval and Clay counties and on the Jacksonville MSA as a whole. Approximately 5,249 direct jobs and 4,758 indirect jobs are expected to be created by the implementation of this scenario (The Arthur Andersen Group et al., n.d.). The creation of these jobs would spur economic activity in the region and potentially create an incentive for people to relocate to the area. However, a large portion of the jobs created under this plan are predicted to be filled by unemployed or underemployed residents currently living in the Jacksonville area, thus decreasing the incentive for new residents to relocate to the area.

Additionally, it is anticipated that ARS 4 would generate approximately $118 million in direct payroll and $92 million in indirect earnings. Implementation of ARS 4 is predicted to generate an estimated $2,164,758 annually in property tax revenues, with the total assessed

value of taxable property on the former Naval station reaching nearly $100 million (The Arthur Andersen Group et al., N.D.).

To implement ARS 4, it is expected that $1.8 million to $4.1 million will be spent annually on operation and maintenance costs and approximately $71.2 million will be spent on one-time capital costs. In addition, this plan would require that more than $173 million be spent on capital improvements by other government and private entities.

ARS 4 is expected to have only a minor impact on the housing market in the City of Jacksonville and its surrounding communities. Implementation of ARS 4 is expected to have only a minor impact on the provision of educational services in Clay and Duval counties.

When the impacts of both closure and reuse are considered, ARS 4 may have a slight positive impact on the school systems in Duval County. As described above, the total number of school-aged children is expected to decrease as a net result of closure and reuse. At the same time, property tax revenues in Duval County are expected to increase as the land previously owned by the Navy will become taxable.

ARS 4 is anticipated to have minor adverse impacts on the provision of fire, police, and ambulance services in the City of Jacksonville. The transfer of NAS Cecil Field from Navy ownership to private or local government ownership would increase the area to be serviced by local police, fire, and ambulance corps, and thereby increase their manpower and equipment needs. The negative effects caused by the increase in the area served by local emergency services would be slightly offset by the transfer of all public safety buildings and equipment (e.g., firehouses, police stations, vehicles) currently used by the Navy at NAS Cecil Field to the City of Jacksonville (CFDC 1996). In addition, implementation of ARS 4 would expand local government revenues through an increase in property tax collections. The additional property tax revenues in conjunction with the transfer of buildings and equipment should more than offset any financial burdens placed on the providers of emergency services.

Since no change in the supply of medical services is anticipated as a result of the preferred alternative, no change in the provision of medical services in the Jacksonville area is projected. Implementation of ARS 4 would positively impact the provision of recreational facilities in the Jacksonville area. Under this alternative, the majority of NAS Cecil Field's existing golf course, athletic fields, and other recreational facilities would be managed by the City of Jacksonville, thereby increasing the recreational facilities available to local residents.

ES.3.8 Transportation

Preferred Reuse Plan. Implementation of Phase 2 development is estimated to generate a total of 14,239 average daily trips and 1,678 peak-hour trips. The proposed development would add very little new traffic on roads surrounding the station. The only roads that would experience significant LOS changes would be portions of Chaffee Road, Normandy Boulevard, and 103rd Street. These deficiencies are projected to occur at the end of Phase 2, and would be addressed by already planned improvements to the regional road network.

Mass transit service to the southwestern extent of the Jacksonville service district may be canceled due to a lack of sufficient density; the relative seclusion of the property would potentially result in a lack of ridership to support service in the initial phases of redevelopment. No significant impact to rail facilities is anticipated.

The Preferred Reuse Plan proposes reuse of existing runways. This reuse would provide for general aviation and cargo activities to utilize existing aviation-related infrastructure. The station is being incorporated into the overall Florida Aviation System Plan. The Federal Aviation Administration (FAA) will have to develop an airport master plan coordinating airspace utilization, safety, and air traffic control requirements.

ARS 1. Implementation of Phase 2 development is projected to generate a total of 11,226 average daily trips, and 1,533 peak-hour trips. Roadways in the area would experience an insignificant increase in traffic volumes over those projections generated by the Metropolitan Planning Office (MPO). Based on the limited amount of development proposed in ARS 1, it is unlikely that the necessary density could be achieved to justify continued transit service.

No rail facility connection is proposed with ARS 1. Use of airport facilities under ARS 1 would be limited to helicopter operations likely associated with the Florida National Guard. No significant impacts would occur.

ARS 2. Implementation of Phase 2 development is estimated to generate a total of 9,263 average daily trips and 1,077 peak-hour trips. Roadways within the region influenced by ARS 2 would experience an increase in traffic volumes over the MPO's projected traffic levels. In most cases, however, this would not result in a significant modification of LOS on the roads. Although LOSs are projected to deteriorate on specific roadways, these would be addressed through already planned roadway improvements in the area surrounding the station.

Mass transit service to this southwestern portion of Jacksonville would likely be canceled due to a lack of sufficient ridership to support service during the initial phases of redevelopment.

No rail facilities are proposed for this reuse alternative. ARS 2 proposes reuse of the existing runways for general aviation and cargo activities to utilize existing aviation-related infrastructure. The station is presently being incorporated into the overall Florida Aviation System Plan. The FAA will have to develop an airport master plan to coordinate airspace utilization, safety, and air traffic control requirements.

ARS 3. Implementation of Phase 2 development is estimated to generate a total of 48,398 average daily trips and 5,110 peak-hour trips. Full buildout of Phase 2 development would result in significant traffic loadings associated with residential and commercial activities.

Mass transit service to the southwestern extent of the Jacksonville service area may initially be canceled due to a lack of sufficient ridership to support service during the initial phases of redevelopment. Due to the development of major trip destinations in the second phase of this alternative, transit service may eventually be determined to be feasible.

No rail service is currently planned for this alternative, but freight service may become feasible as development proceeds. Should the installation of rail facilities prove feasible, it would provide access to the CSX line to the north, and it would provide alternative options for raw material deliveries and shipment of finished products. No airport facilities are proposed for this reuse scenario.

ARS 4. Implementation of Phase 2 development is estimated to generate a total of 27,268 average daily trips and 4,178 peak-hour trips. LOS is projected to deteriorate in a few instances, especially related to Phase 2 development, along portions of Normandy Boulevard, 103rd Street, and Chaffee Road.

Mass transit service to this area may be canceled due to a lack of sufficient density, the relative seclusion of the property would potentially result in a subsequent lack of ridership to support service in the initial period of redevelopment. No rail service is currently planned for this alternative, but freight service may become feasible as development occurs. Should the installation of rail facilities prove feasible, it would provide businesses on the property access to the CSX line to the north, and would provide alternative options for raw material deliveries and shipment of finished products.

ARS 4 proposes reuse of one existing runway and construction of two additional runways. This reuse would provide for general aviation, cargo, and military activities to utilize existing aviation-related infrastructure. The station is being incorporated into the overall Florida Aviation System Plan. The FAA will need to develop an airport management plan coordinating airspace utilization, safety and air traffic control requirements. Therefore, no significant impacts to air facilities would occur.

ES.3.9 Infrastructure and Utilities

Preferred Reuse Plan. The long-term implementation of the Preferred Reuse Plan would necessitate significant changes to the existing water and sewer systems. The most notable improvements would be required at the Yellow Water Area to serve new industrial uses.

Although the potable water production wells have sufficient capacity to serve the redevelopment of Cecil Field, the long-term objective is connection to the city's water distribution system while utilizing Cecil Field's existing distribution system. The water lines are approximately 40 years old and of unknown condition. Fuel tanks that serve the pumps at the well need to be replaced. The water system has inadequate flows and pressures for fire fighting, primarily because of undersized 6-inch mains. According to the construction drawings, the water main at the Yellow Water Area is asbestos cement.

Although the sewer infrastructure is in good condition, functions adequately, and the WWTP is projected to have surplus capacity, the long-term objectives of the Preferred Reuse Plan would require significant improvements and ultimate connection to the city's system. Improvements would include extensions and expansions to new service areas and general upgrades and modifications for regulatory compliance.

In the short term, the stormwater drainage system would not be significantly affected; however, over the long term, site-wide and site-specific conveyance systems and retention/detention facilities would have to be designed and installed. Following station closure, stormwater management would be subject to federal, state, and local regulations and permit requirements. The ultimate receiving entity or individual developers would be responsible for installation of adequate drainage facilities. With few exceptions, the treatment of stormwater runoff is required for all development, redevelopment and existing developed areas when expansion occurs.

The long-term natural gas demand would require expansion of the existing natural gas distribution system to serve newly developed areas. It is expected that the 16-inch gas

transmission line located at the station entrance would be able to provide unlimited supply to potential new users. Long-term demand would require the ultimate receiving entity to make significant improvements to the existing electrical infrastructure, such as overall upgrades and expansions to the existing distribution system, and remetering the base to the Jacksonville Electric Authority's (JEA's) standards. The extent of the upgrades to the existing service distribution would depend on the specific needs of the future development activities.

Under the Preferred Reuse Plan, the steam generating plant would be removed along with the above ground steam lines, requiring a new method for heat production. As a replacement to a centralized steam producing plant, less expensive auxiliary boilers (a practice currently implemented) which are fed by gas line may be used, or electric or gas heating systems could be installed.

Under the Preferred Reuse Plan, no short-term or long-term impacts are expected to occur to the compressed air systems. However, the aviation fuel facilities at the station (the 103rd Street pipeline and the North Fuel Farm) will be closed and not be transferred for reuse. Therefore, under the Preferred Reuse Plan, the ultimate receiving entity or individual users would need to make capital improvements and establish systems for the receipt and storage of aviation fuel to support reuse of the airfield facilities.

Based on projections generated by the City of Jacksonville Department of Public Utilities Solid Waste Division (Perkins 1996), the Preferred Reuse Plan would generate approximately 150,000 tons of waste. This would constitute a reduction of approximately 150,000 tons from existing generation rates.

ARS 1. This alternative involves limited new development. All existing infrastructure assets would remain as under existing conditions. This alternative would create the least demand on utility services such as water, sewer, stormwater, and solid waste. However, under this alternative, underused infrastructure assets are likely to deteriorate. As a result, some areas would need improvements to serve long-term reuse.

ARS 2. ARS 2 involves a low-intensity approach to redevelopment, and emphasizes the reuse of existing buildings within the developed area of the Main Station. Existing infrastructure assets would be removed and/or replaced to support redevelopment. Infrastructure improvements to the Yellow Water Area are not expected; however, maintenance of existing infrastructure systems would be required to support light industrial or other market-driven development at the former ordnance storage areas. Impacts to the existing utility system on the Main Station would be similar to ARS 1, although there is a potential for more

immediate reuse of the systems because of local interest and control of the redevelopment process.

ARS 3. Redevelopment would be more extensive because it would not be limited by aircraft operation activities. Significantly more infrastructure extensions and improvements would be required under ARS 3 than under the Preferred Reuse Plan. As in the Preferred Plan, the long-term objectives of this scenario necessitate connection to the Jacksonville Department of Public Utilities' (JDPU's) water and sewer systems and the development of site-specific and site-wide stormwater management plans and facilities.

ARS 4. ARS 4 involves the redevelopment of NAS Cecil Field as described under the Preferred Reuse Plan, but includes correctional and juvenile justice facilities at the Yellow Water Area and light industry development at the Main Station. Infrastructure system improvements to the Yellow Water Area would be more extensive than in the Preferred Reuse Plan at buildout, and similar to the requirements under ARS 3. Impacts to the existing infrastructure system on the Main Station would be less extensive than under ARS 3 at buildout, and similar to the requirements under the Preferred Reuse Plan. It is expected that JDPU's plan for the provision of water and sewer facilities would be similar to those proposed in the Preferred Reuse Plan.

ES.3.10 Cultural Resources

Preferred Reuse Plan. Sixteen archaeologically sensitive areas were identified at the Main Station and the Yellow Water Area in the base-wide cultural resource assessment for NAS Cecil Field.

In areas proposed for conservation, forestry, parks and recreation, no impacts will occur to sensitive areas because no new development would occur. Eight potentially sensitive areas are located in portions of the Main Station designated for forestry management for the next 25 years. In the long term, these areas would be used for airport expansion if required. Given that no new development would occur in the foreseeable future, no impacts would occur to potential resources in these areas. In the long term, these areas could be affected by construction activities. However, because airport expansion would require further federal actions in the form of approval and permitting from the FAA, it would be subject to future documentation and clearance under NEPA and the National Historical Preservation Act (NHPA).

Two potentially sensitive areas are located in a portion of the Yellow Water Area designated for future light industrial uses. Depending on the site-specific location and design of individual developments, potential resources in these areas could be affected by construction activities.

All 457 standing structures evaluated at the station were determined to be ineligible for inclusion in the National Register of Historic Places (NRHP). Therefore, no impacts would occur to historic architectural resources as a result of implementation of the Preferred Reuse Plan.

ARS 1. Implementation of ARS 1 would result in no development outside currently disturbed areas. Therefore, no impacts would occur to archaeological resources.

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 1.

ARS 2. Implementation of ARS 2 would result in no development outside currently disturbed areas. Therefore, no impacts would occur to archaeological resources.

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 2.

ARS 3. Among the various alternatives, implementation of ARS 3 would result in the greatest potential for affecting archeological resources at the station. In areas proposed for conservation, and parks and recreation, no impacts will occur to sensitive areas because no new development would occur.

Three potentially sensitive areas are located in a portion of the Main Station designated for a new residential community. Based on the large amount of construction necessary to implement this proposal, it is likely that significant affects to potential resources could occur.

Four potentially sensitive areas are located in a portion of the Yellow Water Area designated for future light industrial uses. Depending on the site-specific location and design of individual developments, potential resources in these areas could be affected by construction activities.

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 3.

ARS 4. Implementation of ARS 4 would result in the same impacts as under the Preferred Reuse Plan.

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 4.

ES.3.11 Hazardous Materials Management and Environmental Contamination

All regulatory compliance issues associated with contamination resulting from past Navy operations will be addressed. These compliance issues include hazardous materials and waste management; the Installation Restoration Program (IRP) for remediation of areas of environmental contamination; storage tanks and pipelines; oil/water separators; polychlorinated biphenyls; and unexploded ordnance.

The Navy will provide all property transferees information on the existence, extent, and condition of asbestos-containing material (ACM) at NAS Cecil Field with the property transfer documents. Such information will include: type and location of ACM; results of any testing; description of asbestos control measures; any cost estimates; and any inventory updates.

All ACM that was determined to be a threat to human health (i.e., damaged, friable and accessible) will be abated prior to base closure, unless specific conditions are met by the transferee.

All lead-based paint hazards will be abated for buildings constructed before 1960 that could potentially be reused for purposes involving children (e.g., residential buildings, day care centers, recreation buildings), unless the building is scheduled for demolition or the transferee agrees to abate according to applicable regulations. For buildings constructed from 1960 to 1978, the Navy will provide the results of the lead-based paint survey to transferees. A statement will be included in the deed; however, abatement is not required.

Preferred Reuse Plan. Uses proposed for development at NAS Cecil Field under the Preferred Reuse Plan will involve the use of hazardous materials and generation of hazardous wastes. The quantity of hazardous material used or generated cannot be quantified at this time. Storage, transportation, and disposal of hazardous waste will require compliance with RCRA as implemented through the Florida hazardous waste management regulations. Therefore, based on the current regulatory structure, the Preferred Reuse Plan will not result in an increase in areas of environmental contamination, and no significant impacts are anticipated from hazardous materials and waste management.

The Navy, with the approval of the United States Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP), is undertaking a comprehensive evaluation and investigation of site contamination at NAS Cecil Field. The future use of portions of the station may be affected and may result in restrictions on the use of areas dependent upon the existence and extent/type of contamination, method of remediation (i.e., removal, capping, pump and treat, etc.), the nature of the specific reuse proposal, the potential for human exposure to contamination, and the impacts of reuse on long-term monitoring of contaminated areas.

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under the Proposed Reuse Plan, but none of the proposed land uses would be significantly impacted because of the vast area of land for development. The ultimate decision as to development on an area of environmental contamination will be determined after the Record of Decision (ROD) on the Remedial Design/Remedial Action (RD/RA) of the site. Any restrictions on development will be incorporated into the Finding of Suitability to Lease (FOSL) or Finding of Suitability to Transfer (FOST), and the lease or deed for the property.

ARS 1. Uses proposed for development at NAS Cecil Field under ARS 1, would involve hazardous materials and generation of hazardous wastes. As stated under the Preferred Reuse Plan discussion, existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure no release of hazardous substances occur that will impact human health or the environment.

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under ARS 1. However, none of the proposed land uses would be significantly impacted because of the vast area of developable land. However, the ultimate decision as to development on an area of environmental contamination will be determined after the ROD on the RD/RA for the site. Any restrictions on development will be incorporated into the FOSL or FOST and the lease or deed for the property.

ARS 2. Uses proposed for development at NAS Cecil Field under ARS 2 would involve hazardous materials and the generation of hazardous wastes. As stated under the Preferred Reuse Plan discussion, existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure that no release of hazardous substance occurs that will impact human health or the environment.

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under ARS 2. However, none of the proposed land uses would be significantly impacted because of the vast area of potential development. However, the ultimate decision as to development on an area of environmental contamination will be determined after the ROD based on the RD/RA for the site. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property.

ARS 3. Under ARS 3, various hazardous materials will be stored and used, and various types of hazardous wastes would likely be generated. As stated under the Preferred Reuse Plan discussion, existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure that no release of hazardous substances occurs that will impact human health or the environment.

Development under ARS 3 will not be precluded by the remediation of sites within the IRP or under investigation to determine the need to remediate under the IRP. However, some development may be delayed, and possibly, specific uses precluded.

Whether and what type of development would be permitted on a former area of environmental contamination will be determined after the ROD on the RD/RA of the site. Supporting the ROD will be a Risk Assessment, evaluating where potential exposure would occur in the environment. Clean-up levels at the site will be as approved by EPA and FDEP. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property. However, none of the proposed land uses will be significantly impacted because of the vast area of development.

ARS 4. Under ARS 4, various hazardous materials will be stored and used, and various types of hazardous wastes will likely be generated. As stated under the Preferred Reuse Plan discussion, existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure no release of hazardous substances occur that will impact human health or the environment.

Development under ARS 4 will not be precluded by the remediation of sites within the IRP or under investigation to determine the need to remediate under the IRP. However, some development may be delayed, and possibly specific uses precluded.

Whether and what type of development would be permitted on a former area of environmental contamination will be determined after the ROD on the RD/RA for the site. Supporting the ROD will be a Risk Assessment, evaluating where potential exposure would

occur in the environment. Clean-up levels at the site will be as approved by EPA and FDEP. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property. However, none of the proposed land uses will be significantly impacted because of the vast area of developable land.

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Acronyms

ACM	asbestos-containing materials
ADA	average daily school attendance
ADTs	average daily traffic
AICUZ	Air Installation Compatible Use Zone
AIMD	Aircraft Intermediate Maintenance Department
AOI	Areas of Interest
ARS	Alternative Reuse Scenario
AST	aboveground storage tank
AVORD	Aviation Ordnance
BEQ	Bachelor Enlisted Quarters
BGS	below ground surface
BOQ	Bachelor Officers Quarters
BRAC	Base Closure and Realignment Act
BSA	Base student allocation
C&D	construction and demolition
CA	Contamination Assessment
CAR	Contamination Assessment Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Comprehensive Environmental Response Facilitation Act
CFDC	Cecil Field Development Commission
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CIP	Capital Improvements Program
CMS	Concurrency Management System
CO	carbon monoxide
CRPP	Comprehensive Regional Policy Plan
CZMA	Coastal Zone Management Act
dB	decibel
dB(A)	A-weighted decibel
DCA	Florida Department of Community Affairs
DCTA	Florida Defense Conversion and Transition Act
DDT	dichlorodiphenyltrichloroethene
DEIS	draft environmental impact statement
DoD	U.S. Department of Defense
DRI	development of regional impact
EBS	environmental baseline survey
EIS	environmental impact statement
EMT	earth mounded tank
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

Acronyms (Cont.)

ESQD	explosive safety quantity distance
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FAR	floor area ratio
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FDHR	Florida Division of Historical Resources
FDOT	Florida Department of Transportation
FEC	Florida East Coast Railway
FEIS	final environmental impact statement
FFA	Federal Facilities Agreement
FGFWFC	Florida Game and Fresh Water Fish Commission
FGS	Florida Geological Survey
FLU	future land use
FNAI	Florida Natural Areas Inventory
FOSL	finding of suitability to lease
FOST	finding of suitability to transfer
FS	Florida Statute
FY	fiscal year
GIS	geographic information system
gpm	gallons per minute
HAP	hazardous air pollutant
HAZMAT	hazardous materials
HHS	United States Department of Health and Human Services
HNM	Heliport Noise Model
HRS	Hazardous Ranking System
HUD	United States Department of Housing and Urban Development
IAS	initial assessment study
INM	Integrated Noise Model
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ITE	Institute of Transportation Engineers
JDPU	Jacksonville Department of Public Utilities
JEA	Jacksonville Electric Authority
JETC	Jet Engine Testing Cells
JIA	Jacksonville International Airport
JMPO	Jacksonville Metropolitan Planning Office
JTA	Jacksonville Transportation Authority
kV	kilovolt
LBP	lead-based paint
Ldn	day-night average sound level
LDR	land development regulation
LOS	level of service
LTO	landing/takeoff
MCAS	Marine Corps Air Station
mg/L	milligrams per liter
mgd	million gallons per day

Acronyms (Cont.)

MPO	Metropolitan Planning Organization
MSA	metropolitan statistical area
MSL	mean sea level
MWR	Morale, Welfare and Recreation
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NAVRAMP	Navy Radon Assessment and Mitigation Program
NEPA	National Environmental Policy Act
NFF	North Fuel Farm
NHPA	National Historical Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge and Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OEW	ordnance explosive wastes
OLF	outlying landing field
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PEM	Palustrine emergent
PFO	Palustrine forested
POV	personally owned vehicle
pph	pounds per hour
ppm	parts per million
psi	pounds per square inch
PSS	Palustrine scrub shrub
PVC	polyvinyl chloride
PWC	Public Works Center
RA	remedial action
RAP	Remedial Action Plan
RASO	Radiological Affairs and Support Office
RCRA	Resource Conservation and Recovery Act
RESD	Regulatory and Environmental Services Department
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCS	soil conservation service
SIP	State Implementation Plan
SJRWMD	St. Johns River Water Management District
SO_2	sulfur dioxide
T&G	touch-and-go
TSCA	Toxic Substances Control Act
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Acronyms (Cont.)

UST	underground storage tank
UXO	unexploded ordnance
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WWTP	wastewater treatment plant
YWWC	Yellow Water Weapons Compound

1 Purpose and Need

1.1 Introduction

As a result of the 1993 mandates of the Defense Base Closure and Realignment Commission (Commission), as approved by Congress pursuant to the Defense Base Closure and Realignment Act of 1990 (commonly referred to as BRAC), Naval Air Station (NAS) Cecil Field, located in Duval and Clay counties, Florida, will be closed. The United States Department of the Navy has prepared this Draft Environmental Impact Statement (DEIS) to evaluate the potential environmental effects of disposal and reuse of the station by other entities.

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality Regulations on Implementing NEPA Procedures (40 CFR 1500-1508); OPNAVINST 5090.1B; Defense Base Closure and Realignment Act of 1990 (Title XXIX of P.L. 101-510) as amended by PL 102-190 and PL 102-484.

1.2 Purpose and Need

The purpose of the proposed action is to comply with BRAC and President Clinton's five-part plan, "A Program to Revitalize Base Closure Communities" (July 2, 1993). BRAC exempts the Navy from considering under NEPA the need for closing or realigning those military installations that have been recommended for closure or realignment by the Commission. Closure of NAS Cecil Field was mandated by BRAC for the purpose of reducing the military infrastructure and saving operation and maintenance costs over the long term. Disposal of the property is necessary so that the Navy does not continue to incur operation and maintenance costs for the facility after it has closed. Operational closure of NAS Cecil Field is scheduled to occur by August 1999 (Donoghue 1997).

The purpose of this DEIS is to assist the Secretary of the Navy in a series of interrelated decisions concerning the future disposition of the station. The local community has established the Cecil Field Development Commission (CFDC), a recognized local redevelopment authority, in accordance with federal regulations, to formulate a reuse plan for the station to guide its redevelopment following disposal by the Navy. While the Navy will be responsible for the disposal of the station, oversight of the station's subsequent redevelopment after its disposal will be the responsibility of the ultimate receiving entity for the station property, to be determined prior to the final disposal of the station. This DEIS provides the decision makers and the public with the information required to understand the future environmental consequences of the potential reuse of the NAS Cecil Field property.

Another purpose of this DEIS is to assist the local community in implementing a preferred plan and supplementing future planning and redevelopment decisions. This DEIS identifies potential environmental impacts that would result from redevelopment of the property pursuant to the CFDC's reuse plan and reasonable alternatives to this plan. It is not the intent of the Navy to endorse or authorize a particular reuse scenario, but only to project potential impacts and identify reasonable mitigation measures.

1.3 Proposed Action

In accordance with Title 32, Code of Federal Regulations (CFR), Parts 90 and 91, the proposed action in this DEIS is the disposal of surplus Navy property and reuse and redevelopment of the property pursuant to the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). The entire reuse plan is not included in the DEIS, but rather is summarized in Section 2 of this document to provide an understanding of the plan for impact analysis purposes. The reuse plan, in its entirety, is available through the CFDC. It should be noted that the reuse plan and alternatives to this plan are conceptual and are intended to focus on proposed future land uses and not on site-specific developments. Detailed engineering studies and design plans will need to be conducted by the receiving entity or specific project sponsors prior to implementation of redevelopment activities.

The redevelopment and reuse of the property will be the responsibility of the ultimate receiving entity and individual project sponsors, not the Navy. As such, these entities along with local, state, and other federal agencies, will ultimately be responsible for ensuring that redevelopment occurs, appropriate permits and approvals are obtained, and suggested mitigation measures are implemented.

1.4 Location of the Proposed Action

NAS Cecil Field is located primarily within southwestern Duval County and within the corporate limits of the City of Jacksonville, 14 miles west of downtown Jacksonville (The City of Jacksonville and Duval County have a consolidated government). A relatively small portion of the station is located within north-central Clay County (see Figures 1-1 and 1-2). The station is a master jet base, designed to support training of Naval aviators and deployment of Naval jet aircraft. The station is currently home port to approximately 350 aircraft, primarily consisting of F/A-18 Hornet and S-3 Viking aircraft (Navy 1994a).

NAS Cecil Field land holdings encompass approximately 31,366 acres of owned/leased property and lands with easement controls within the following areas (see Table 1-1) (Navy 1988; Nelson 1994):

- The Main Station, which is composed of approximately 9,516 acres of Navy-owned, leased, and easement land, generally located south of Normandy Boulevard (Duval County Route 228);
- The Yellow Water Area, which is composed of approximately 8,091 acres of Navy-owned land, generally located north of Normandy Boulevard;
- The station's Outlying Landing Field (OLF) Whitehouse, which is composed of approximately 2,565 acres of Navy-owned and easement land, located 7 miles north of the Main Station at the termination of Halsema Road;
- The Pinecastle Target Complex, located 90 miles south of Jacksonville in Lake, Marion, Putnam, and Clay counties, encompassing a total of approximately 11,142 acres of Navy-owned, leased, and easement land in four outlying target ranges (see Figure 1-3); and
- Other outlying sites totaling approximately 52 acres, including the Tactical Aircrew Training System (TACTS) area, consisting of overwater areas and transmitting towers for simulated air-to-air combat training.

This DEIS only addresses the environmental effects of reuse of station properties to be disposed by the Navy, which comprise approximately 17,202 acres of land at the Main Station and Yellow Water area. Properties at or operated by NAS Cecil Field that the Navy

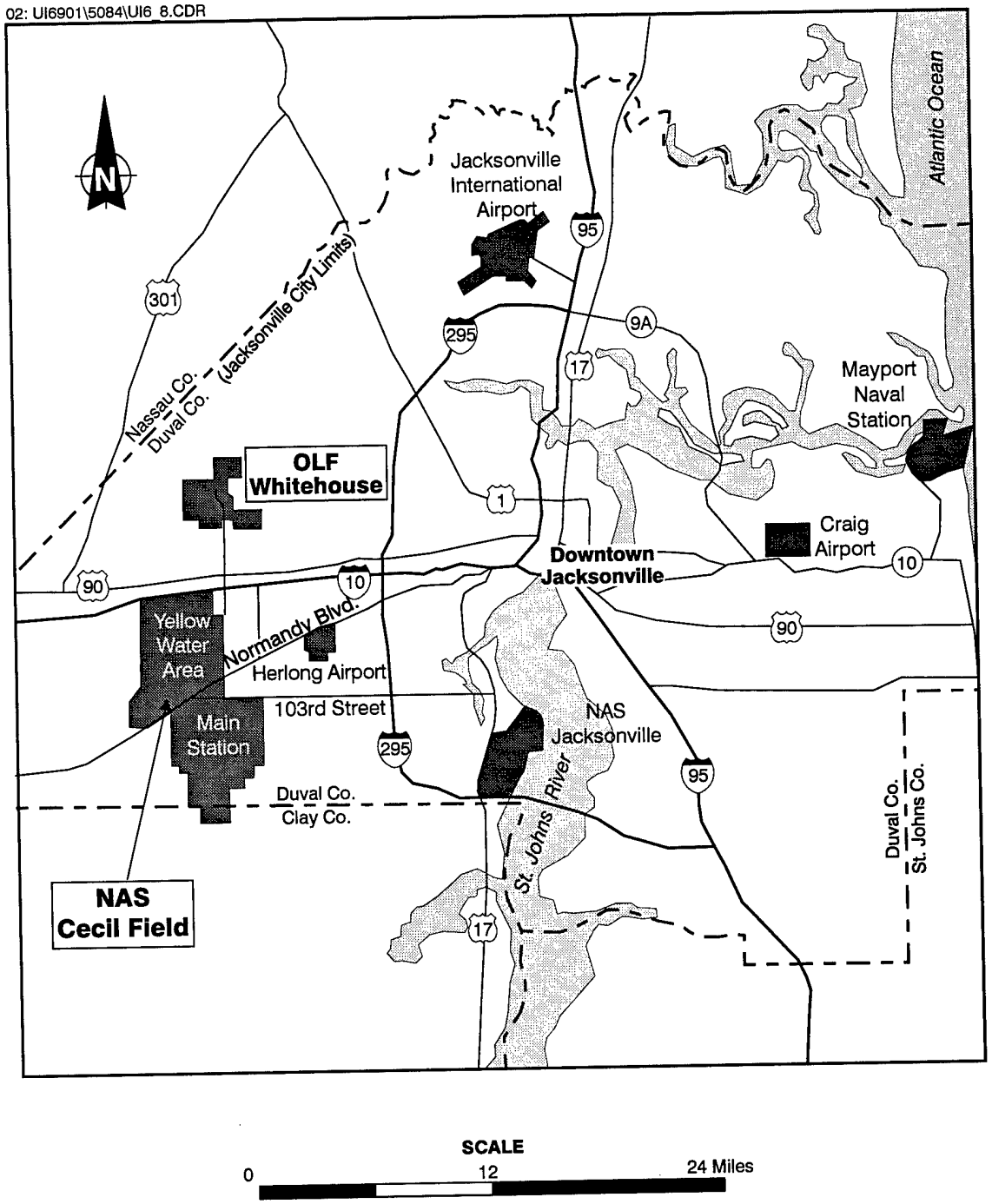

Figure 1-1 REGIONAL LOCATION, NAS CECIL FIELD

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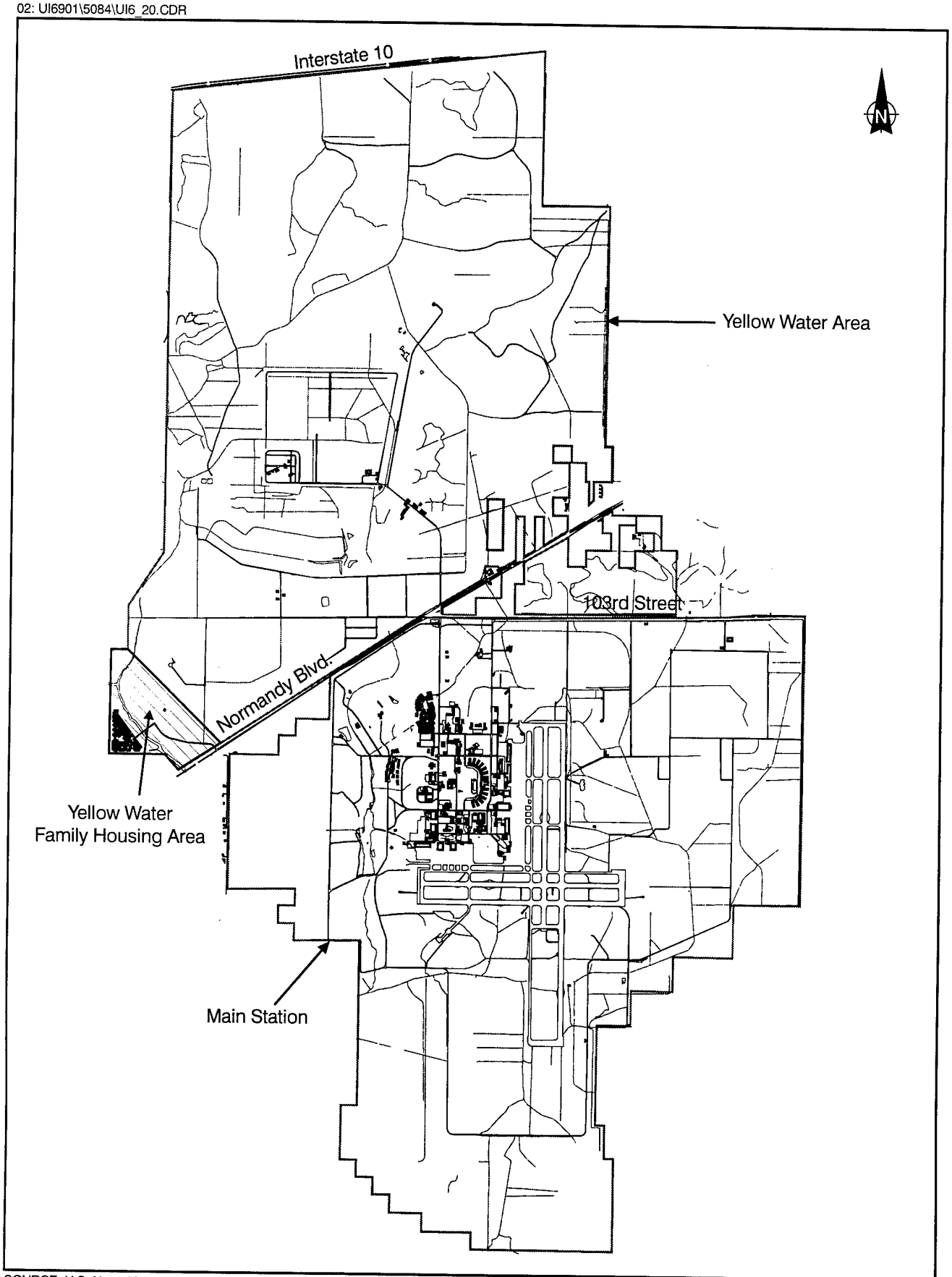

SOURCE: U.S. Navy 1994c

SCALE
0 ½ 1 Mile

Figure 1-2 MAIN STATION AND YELLOW WATER AREA NAS CECIL FIELD

Table 1-1

SUMMARY OF NAS CECIL FIELD LAND HOLDINGS

Area	Acres Owned	Acres with Easements	Acres Leased	Total Acres
Holdings in the City of Jacksonville/Duval County and Clay County, Florida				
Cecil Field Main Station	9,336.02	179.69	.18	9,515.89
Yellow Water Weapons Annex	8,091.10	—	—	8,091.10
OLF Whitehouse	1,906.95	657.69	—	2,564.64
Holdings Associated with Pinecastle Target Complex				
Pinecastle Range	—	—	5,894.81	5,894.81
Rodman Range	2,690.00	2.51	—	2,692.51
Lake George Range	0.78	0.22	—	1.00
Stevens Lake Target	—	—	2,554.00	2,554.00
Other Holdings				
TACTS Area	51.42	—	—	51.42
Palatka Radar Site	—	—	.92	.92
TOTAL	22,076.27	840.11	8,449.91	31,366.29

Source: U.S. Navy 1994a; Nelson 1994.

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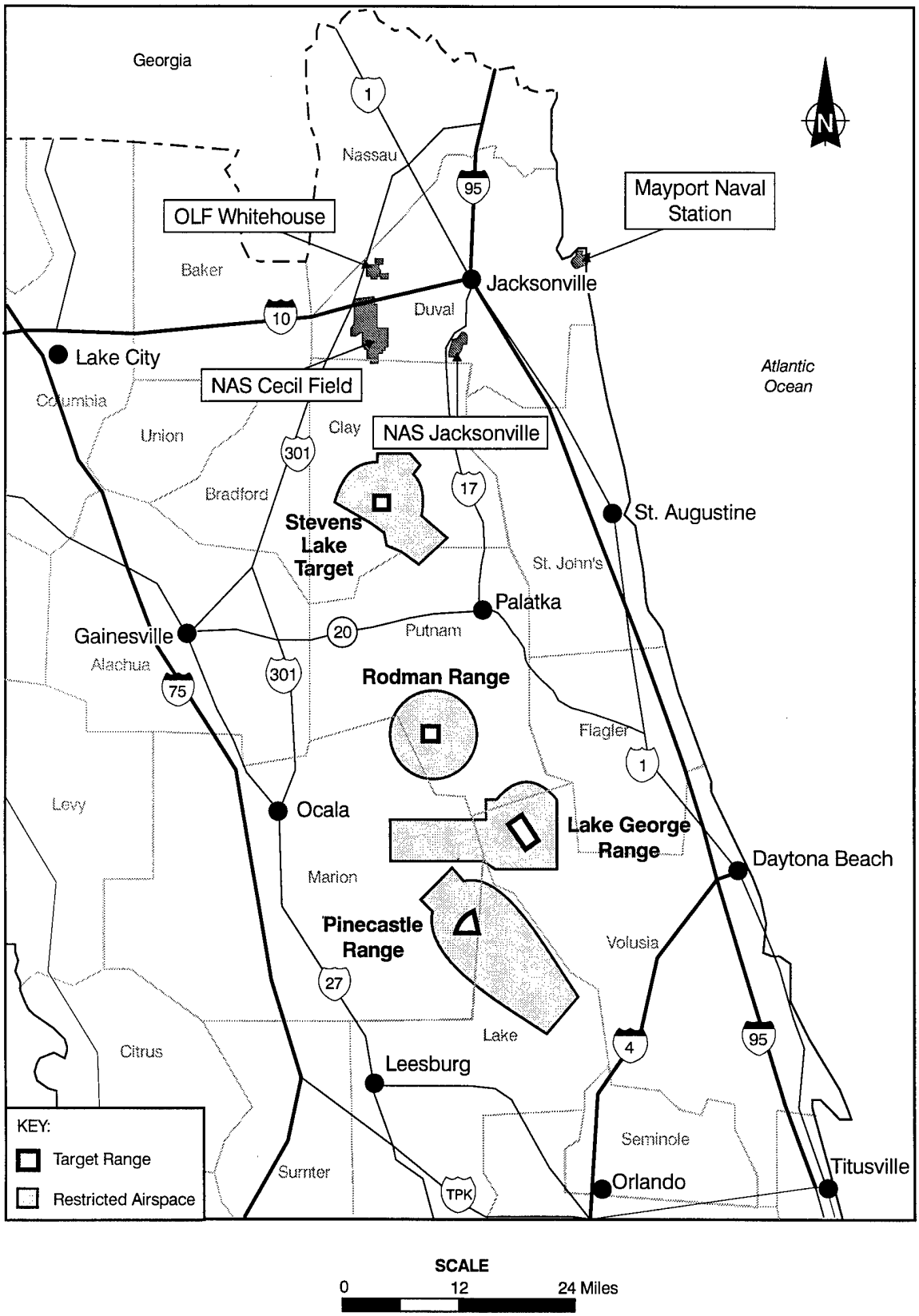


Figure 1-3 PINECASTLE TARGET COMPLEX NAS CECIL FIELD

will retain include: OLF Whitehouse; the Yellow Water Family Housing Area (200 units located on 252 acres in the southwestern portion of the Yellow Water area); the Pinecastle Target Complex; and the TACTS area.

1.5 Public Involvement

A notice of intent (NOI) to prepare a DEIS was published in the *Federal Register* on January 25, 1995 (see Appendix A). In addition, a scoping notification letter and fact sheet were distributed to federal, state, and local elected officials, agency representatives; and other interested parties. Notices of the Navy's intent to prepare a DEIS and an invitation to public scoping meetings were published in the *Florida Times-Union* on February 4, 1995, and February 5, 1995 (see Appendix A).

A public scoping meeting was held on February 9, 1995, at the Post of Snyder, Army National Guard Center, located on Normandy Boulevard near the station. This meeting provided the public with an opportunity to comment on the scope of the DEIS. Thirty-eight people attended the scoping meeting. Eight written responses were received prior to the end of the comment period on March 11, 1995.

In addition, as part of the Florida state review process for the approval of military base reuse plans, the CFDC conducted a two-day preapplication conference at NAS Cecil Field in July 1995. Various Florida regulatory agencies attended the conference to discuss issues of concern related to the reuse of the station. As part of this conference, the Navy discussed the anticipated scope of the DEIS and planned approaches to assessing impacts to various environmental resources and invited the agencies to submit written comments.

Issues and concerns derived from comments received during the scoping period, the CFDC's preapplication conference, and conversations with representatives of government agencies and agency correspondence in connection with the data collection efforts for the DEIS are presented in Table 1-2. In addition, this table notes the section of the DEIS in which each issue is addressed.

The Navy will distribute the DEIS to all interested persons for review and comment. Comments on this DEIS will be received during a public hearing to be held during this review period. All comments at this hearing and forwarded in writing will be considered in the Final EIS (FEIS), which will be prepared after the 45-day public review period.

Table 1-2

ISSUES IDENTIFIED AT THE SCOPING MEETING AND IN WRITTEN COMMENTS NAS CECIL FIELD

Issue	DEIS Section
Agency Coordination (EPA)	1.5
Evaluation of Alternatives (EPA)	2
Mitigation Measures (EPA)	4
Noise and Lighting Impacts (EPA)	4.6
Air and Ground Traffic Impacts (EPA)	4.8
Air Quality Impacts (EPA)	4.5
Air Quality Mitigation Measures (EPA)	4.5
Environmental Justice Considerations (EPA)	4.12
Pollution Prevention Programs (EPA)	4.11
Historic and Cultural Resources (NTHP)	4.10
Parks and Recreational Areas (DOI)	3.7 and 4.7
Fish and Wildlife Management (DOI)	3.3 and 4.3
Floodplain Impacts (FGFWFC)	4.4
Endangered Species (FGFWFC)	3.3 and 4.3
Water Management (FDEP)	3.4 and 4.4
Wildlife and Forest Management (FDEP)	3.3 and 4.3
Surrounding Land Use (FDEP)	3.1 and 4.1
Regional Mitigation Efforts (FDEP)	4
Ecosystem Management (FDEP)	3.3 and 4.3
Alternative Analysis (FDEP)	2
Consistency with Coastal Zone Management Act (FDEP)	3.1, 4.1, 4.12
Greenways/Conservation Areas (FDEP)	3.1 and 4.1
Conservation Issues (SJRWMD)	3.1 and 4.1
Wetlands (Florida Department of Corrections)	3.3.1
Endangered Species (Florida Department of Corrections)	3.3.2
Water and Wastewater Infrastructure (Florida Department of Corrections)	3.9 and 4.9
Road Improvements (Florida Department of Corrections)	3.8 and 4.8
Employment Impacts	4.7

Key at end of table.

Table 1-2 (Cont.)

Key:

DEIS = Draft Environmental Impact Statement.
FDEP = Florida Department of Environmental Protection.
DOI = United States Department of the Interior.
EPA = United States Environmental Protection Agency.
FGFWFC = Florida Game and Fresh Water Fish Commission.
NTHP = National Trust for Historic Properties.
SJRWMD = St. Johns River Water Management District.

Source: Ecology and Environment, Inc., 1996.

1.6 Future Actions

Several issues pertaining to the implementation of the CFDC's Base Reuse Plan have not been resolved. Many of these issues cannot be fully addressed at this time because necessary studies and investigations are ongoing, or the CFDC has not taken formal action, or detailed engineering and design studies have not been prepared by responsible site redevelopers. These issues are identified in order to provide decision makers with an understanding of the key factors in reuse planning that cannot be fully evaluated at this time. These issues will continue to be addressed during the transfer of property and subsequent redevelopment.

1.6.1 Permits and Approvals

Once detailed engineering, planning, and design studies are prepared, the responsible developer of specific projects would apply for appropriate permits. A list of the major federal, state, and local permits and approvals that may be required prior to implementing site-specific redevelopment projects is presented in Table 1-3. Oversight of redevelopment will be the responsibility of the CFDC and, potentially, other entities which are charged by the authority to develop specific components of the reuse plan.

1.6.2 Status and Extent of Environmental Cleanup

The Navy, with the approval of the United States Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP), is undertaking a comprehensive evaluation and investigation of site contamination at NAS Cecil Field. Although final conclusions are not available, the status and current findings of these studies are summarized in Sections 3.11 and 4.11 of this DEIS. The future use of portions of the station may be affected and may result in restrictions on the use of areas dependent upon the existence and extent/type of contamination, method of remediation (i.e., removal, capping, pump and treat, etc.), the nature of the specific reuse proposal, the potential for human exposure to contamination, and the impacts of reuse on long-term monitoring of contaminated areas.

Table 1-3

MAJOR PERMITS AND APPROVALS THAT MAY BE REQUIRED FOR REDEVELOPMENT[a] NAS CECIL FIELD

Permits and Approvals Required	Actions Requiring Permits or Approvals	Agencies Involved
Federal		
Clean Water Act, Section 404 (33 CFR 323) (permit)	Loss of wetlands	USACE
Clean Air Act (amended 1990) Title 5, air operating permit and air construction (40 CFR Part 60) (permit)	Construction and/or operation of air emissions source	FDEP
Endangered Species Act, Section 7 (50 CFR 17 et seq.) (approval)	Disturbance of threatened or endangered species by federal actions (e.g., projects requiring a federal permit)	USFWS
State		
Florida Standards for Storm Water Management and Sediment Reduction Program (permit)	Land-disturbing activities	FDEP
Florida Coastal Zone Management Program (approval)	Alteration of critical areas of the coastal zone	FDEP
Storm Water Rule (Chapter 17-25, Florida Administrative Code) (permit)	Storm water runoff/management	FDEP
Florida State Comprehensive Plan and Regional Policy Plan (approval)	Consistency of reuse plan with state comprehensive plan	City of Jacksonville and Clay County
Local		
Zoning review and site plan approval via local land development regulations (approval)	Development within the affected municipality	City of Jacksonville
Storm water discharge (permit)	Storm water discharges	SJRWMD

[a] Other permits and approvals may be necessary depending on specific components of the reuse plan that are not currently known. It is also possible that subsequent National Environmental Policy Act (NEPA) documentation may be required if the reuse plan is significantly modified during implementation.

Key:

CFR = Code of Federal Regulations.
EPA = United States Environmental Protection Agency.
FDEP = Florida Department of Environmental Protection.
NPDES = National Pollutant Discharge Elimination System.
SJRWMD = St. John's River Water Management District.
USACE = United States Army Corps of Engineers.
USFWS = United States Fish and Wildlife Service.

Source: Ecology and Environment, Inc., 1996.

2 Alternatives Including the Proposed Action

Section 2 describes the proposed action and reasonable alternatives considered in this DEIS. Other alternatives were identified but eliminated from further consideration because they were determined to be unreasonable; they are also briefly described in this section. The potential environmental impacts of the proposed action and each alternative are summarized for comparative purposes, and the rationale for the selection of the preferred alternative is presented. A full discussion of the environmental impacts of the proposed action and the alternatives is provided in Section 4.

2.1 Background

The disposal of NAS Cecil Field will be conducted in compliance with the Federal Property and Administrative Services Act of 1949 and the Surplus Properties Act of 1944, as modified by BRAC, Title XXIV of the National Defense Authorization Act of 1994, and 32 CFR Parts 90 and 91. These laws and regulations identify the process that must be followed when disposing of federal property, specifically property associated with closing military installations. This process includes the solicitation of requests for transfer of land and facilities for reuse by other entities.

A series of entities, including the Florida Department of Corrections, the Florida Department of Juvenile Justice, the Jacksonville Port Authority (JAXPORT), the FDEP, and the Florida Department of Agriculture and Consumer Services, Division of Forestry, requested conveyances of land and/or facilities at the station. These entities' requests were reviewed in conjunction with the CFDC to determine whether they were compatible with the Final Base Reuse Plan, as provided for under 32 CFR Parts 90 and 91. Each of the land uses associated with these requests are included in the Final Base Reuse Plan and/or each of the alternatives (see Section 2.2).

Possible reuse scenarios for NAS Cecil Field will also be influenced by laws and regulations unique to the State of Florida, which has a stringent regulatory system to oversee land development. Under Chapter 163, Florida Statutes (FS), all of Florida's counties and municipalities must adopt a comprehensive plan that sets forth goals, objectives, and polices to guide land development. These plans must be approved by the Florida Department of Community Affairs (DCA) for consistency with adopted Regional Policy Plans and the Florida State Comprehensive Plan. Each government must then adopt land development regulations to implement the policies contained with the comprehensive plan. There are limits to the number of times a comprehensive plan or land development regulation may be amended by a local community.

Also, developments such as the reuse of NAS Cecil Field would typically require review in accordance with the state's regulations pertaining to developments of regional impact (DRIs) under Chapter 380, FS. These regulations require an extended review and documentation process for large-scale developments.

The state has enacted legislation (Section 288.03, FS) to attempt to streamline these processes in the case of military base reuse plans. This legislation created an optional military base reuse planning process that supersedes Florida's DRI regulations, provided that a community's base reuse plan meets the content requirements of the law and is adopted as an amendment to the comprehensive plan in accordance with the nonprocedural requirements of Chapter 163, FS. The legislation waives the restrictions on the number of comprehensive plan amendments permitted in a specific time period for military base reuse plans. It also encourages the use of federal NEPA documentation for disposal/reuse, in lieu of DRI analyses, to assess the impacts of such plans.

2.2 Reuse Alternatives

2.2.1 Reuse Plan Process

The reuse planning process for NAS Cecil Field was initiated on July 19, 1993, when Ed Austin, who was then the mayor of Jacksonville, created the Mayor's Commission on Base Conversion and Redevelopment by Executive Order No. 93-167. The organization, whose name was later changed to the CFDC, is composed of 35 mayoral appointees from government and business leaders in Jacksonville and the surrounding counties. The primary goal of the CFDC is to develop a consensus within the region and prepare a plan for the reuse of NAS Cecil Field.

The planning process began in July 1993 and consisted of the following phases:

- Development of goals, visions, and objectives;
- Completion of community outreach and public participation;
- Inventory, mapping, and analysis of on-base and off-base conditions;
- Identification of current and long-term local, regional, and national business trends via an economic and market analysis;
- Development of reuse alternatives;
- Completion of a preliminary and Final Base Reuse Plan; and
- Completion of an implementation strategy for the Final Base Reuse Plan.

Throughout the development of the Base Reuse Plan, CFDC sought and obtained input from all affected constituencies. The community outreach program included six public forums, numerous commission meetings, several public presentations, and newsletters. Public opinions and comments were solicited and incorporated throughout the process. In addition to these formal meetings, the *Florida Times-Union*, *Jacksonville Business Journal*, and local television media ran several articles and reports regarding the reuse plan and the results of the public meetings.

Community participation ensured a responsive planning effort and helped set priorities for reuse. The goals identified by the CFDC for the Base Reuse Plan included diversifying the economy through focused redevelopment of NAS Cecil Field and replacing jobs lost by the station's closure (CFDC 1996).

The CFDC formally adopted the Final Base Reuse Plan for NAS Cecil Field in March 1996 (CFDC 1996). In accordance with federal regulations, this plan is considered the proposed action (i.e., Preferred Reuse Plan) for this DEIS (see Section 2.2.3).

Because redevelopment of the NAS Cecil Field property will occur over an extended period, the Final Base Reuse Plan recommends the establishment of a new public authority or the use of an existing authority to receive the property and oversee redevelopment (CFDC 1996). This authority would be empowered to act as a master developer for the property, responsible for infrastructure improvements, financing, sales, leasing, and disposition of station properties for an extended period of time. Although the decision on whether to use an existing authority or establish a new authority has not been finalized, the overall approach would be to use an entity that is specifically tasked with encouraging and facilitating sound redevelopment of the property (CFDC 1996). Because these decisions have not been

finalized, this DEIS references such an entity as the "ultimate receiving entity" of the station property.

2.2.2 Modification of CFDC's Alternative Reuse Scenarios

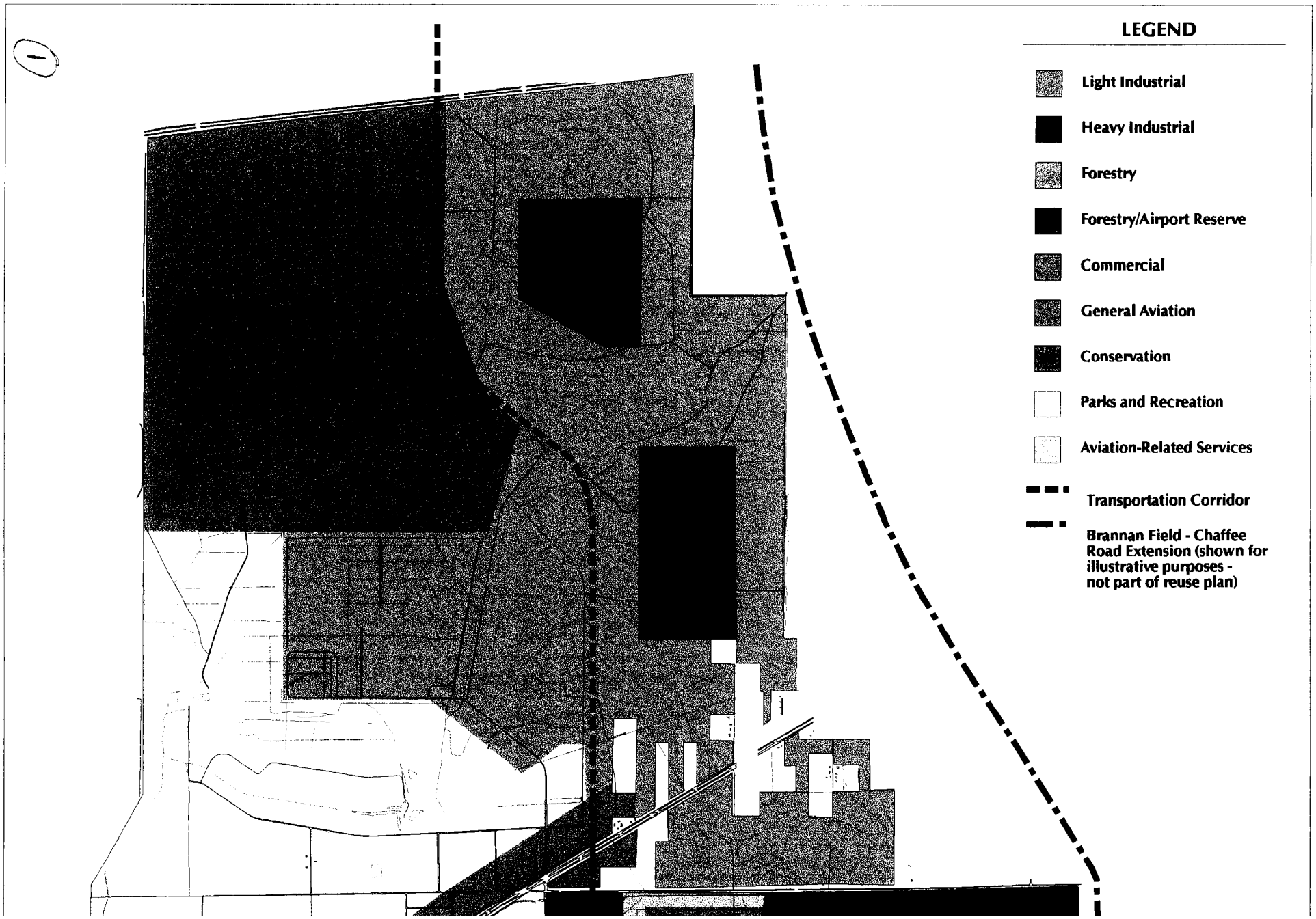
A major element of the Base Reuse Plan process was the development of a series of alternative reuse scenarios (ARSs) for the station. Following an analysis of the market potential for redevelopment of the station property, requests for land/facilities from various entities, and an assessment of existing development opportunities and physical development constraints (e.g., wetlands, significant habitat, contaminated sites, etc.), the CFDC generated the Preferred Reuse Plan and a series of four ARSs that tested broad concepts for redevelopment.

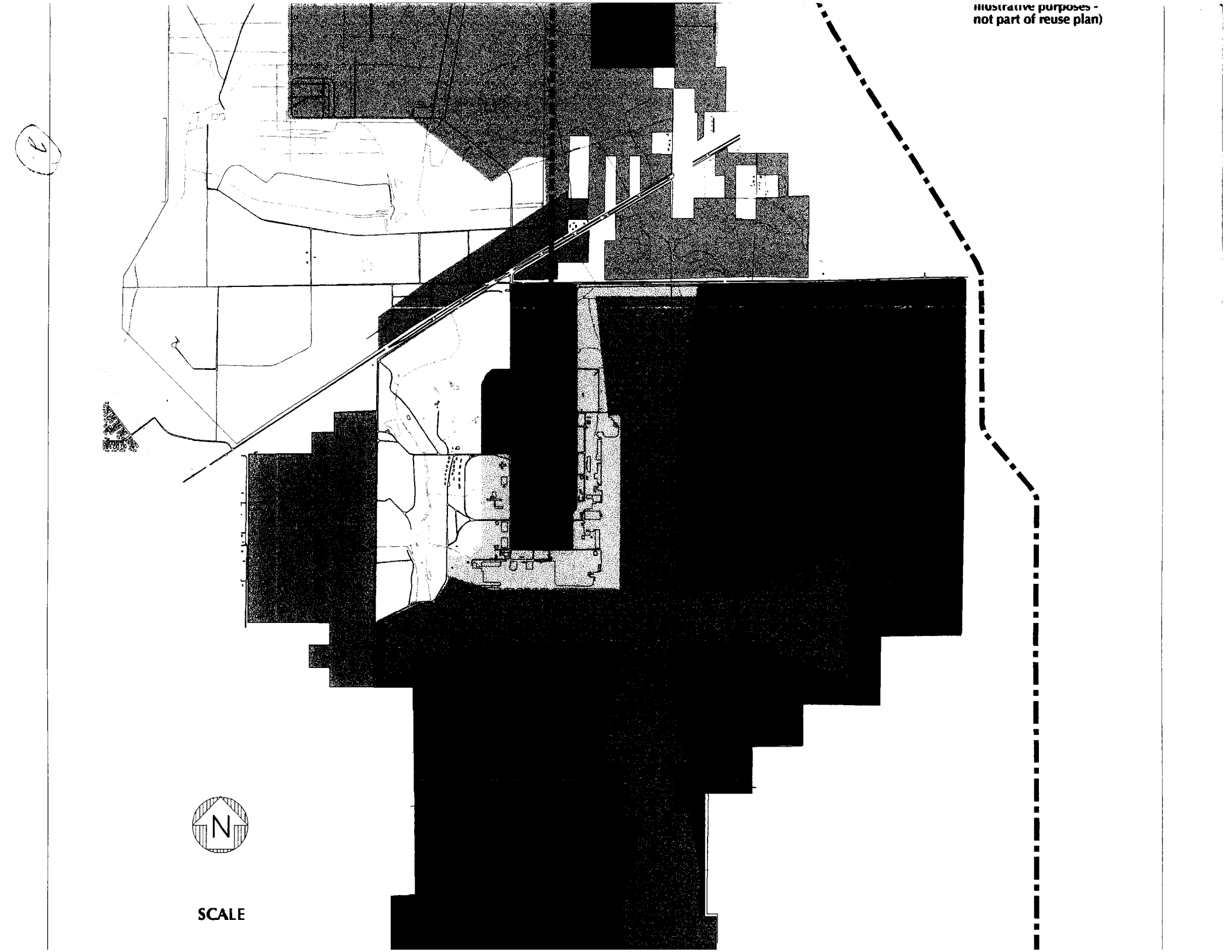
For purposes of this DEIS, the Navy has modified each ARS developed by the CFDC to respond to changes in circumstances that occurred since the time the alternatives were first developed. These included identification of future uses for specific parcels in the developed area of the Main Station that were not targeted for any future use. In such cases, it is assumed that these lands would be used for market-driven reuse/development by private interests.

The discussions of the proposed action and each ARS include a general description of the land use plan; a breakdown of assumed land use acreages and maximum floor area ratios (FARs) in each land use category and estimates of development that could possibly be realized over two phases of redevelopment (1998 to 2004 and 2005 to 2010) according to CFDC's market analyses. It should be noted that the assumed land use acreages and projected development are broad estimates only. They are presented to establish a reasonable basis for determining potential impacts that may result from reuse of the station property after disposal by the Navy.

2.2.3 Proposed Action (Preferred Reuse Plan)

The Preferred Reuse Plan corresponds to the "Aviation Mixed Use" concept discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, NAS Cecil Field lands would be aggressively marketed for redevelopment for aviation and other industrial and commercial uses. Job creation would be the primary goal, and significant infrastructure and road improvements would be implemented to foster development. The Preferred Reuse Plan is illustrated in Figure 2-1. The acreages and assumed maximum FARs that would be used to determine the extent of future development in each land use category (i.e.,


LEGEND
Light Industrial
Heavy Industrial
Forestry
Forestry/Airport Reserve
Commercial
General Aviation
Conservation
Parks and Recreation
Aviation-Related Services
Transportation Corridor
Brannan Field - Chaffee Road Extension (shown for illustrative purposes - not part of reuse plan)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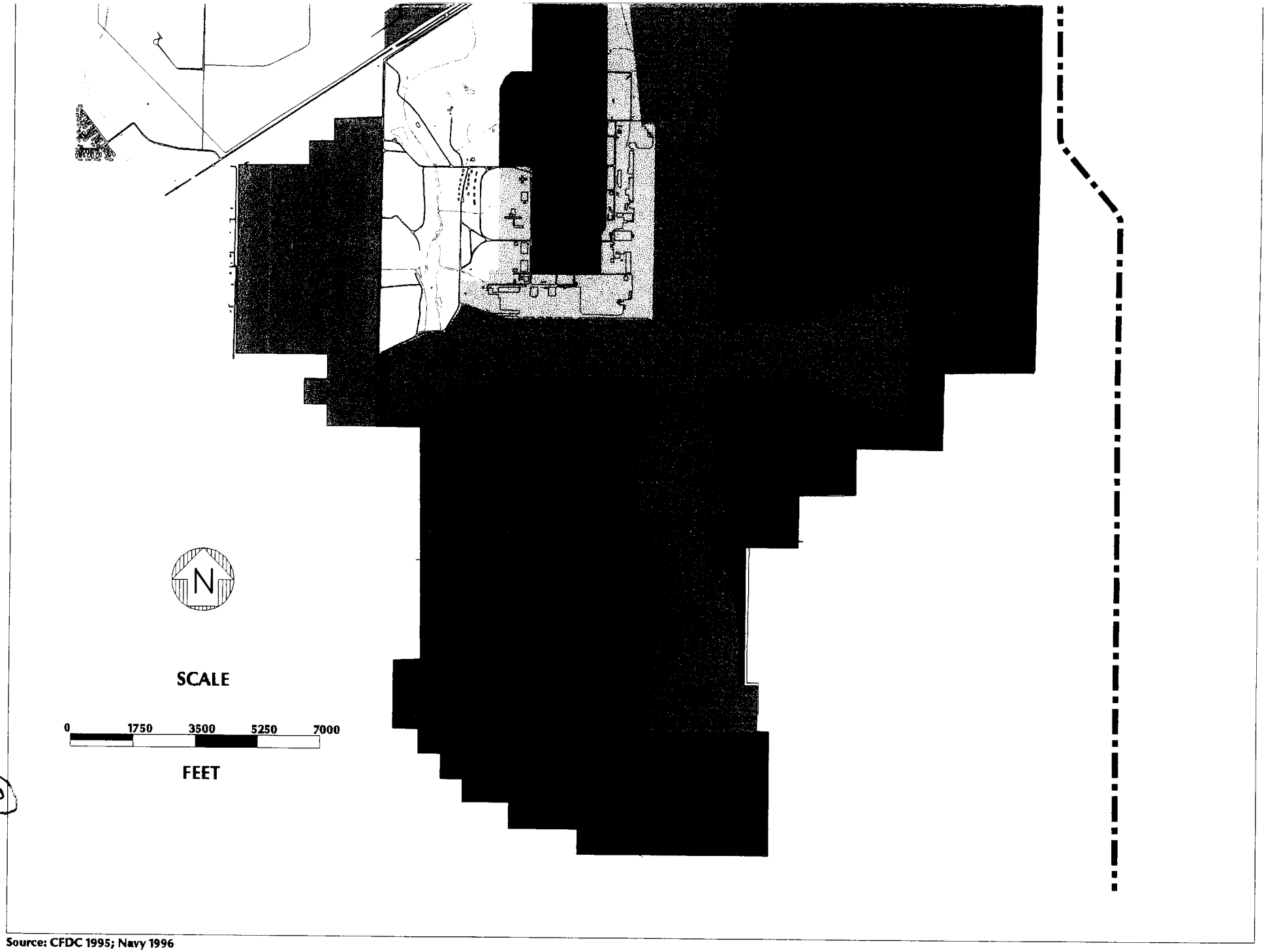


Source: CFDC 1995; Navy 1996

Figure 2-1 LAND USE PLAN - PREFERRED REUSE PLAN

aviation, industrial, commercial, etc.) under the plan are presented in Table 2-1. The projected amount of reused facilities/new construction over two phases of redevelopment, based upon CFDC's market analyses, is presented in Table 2-2. It is estimated that approximately 1.2 million square feet of existing facilities would be reused and 3.9 million square feet of new facilities would be developed by 2010 (CFDC 1996).

The future land use plan under the Preferred Reuse Plan would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian and military use. It is anticipated that some facilities would be used to accommodate helicopter units. Additional land at the Main Station would also be retained for future airport expansion and managed as forestry resources in the interim.

Estimated aircraft operations by aircraft type associated with the Preferred Reuse Plan are presented in Table 2-3. These estimates are based upon interviews conducted by the CFDC with potential future users of the airfield. These could potentially include operations by helicopters and various types of fixed-wing aircraft, totaling 96,050 landing and takeoff (LTO) cycles and 9,250 touch-and-go operations by 2010. Actual operations may vary based upon an airport master plan that would be developed in conjunction with the Federal Aviation Administration (FAA), prior to use of the airfield after its disposal by the Navy. This plan is in the early stages of development and would be subject to separate NEPA documentation (Simpson 1996).

The NAS Cecil Field golf course and other recreational lands on the Main Station (e.g. Lake Fretwell) and portions of the Yellow Water Area would be reused for passive and active parks and recreational facilities as well as equestrian uses.

The balance of the property would be developed for a variety of industrial and commercial uses. Areas in the eastern and central portions of the Yellow Water Area and areas in the northern portion of the Main Station would be developed for light and heavy industrial use. Commercial development would be focused on the northern and southern frontages of Normandy Boulevard. The northwestern portions of the Yellow Water Area and the Main Station would be used for forestry management.

Within the developed area of the Main Station, a significant amount of demolition would potentially occur to clear large areas for redevelopment of heavy industrial uses such as assembly shops for automotive and aviation parts. A series of existing barracks and classroom/office facilities would be retained for use as a conference/training center for companies that locate on the property (CFDC 1996).

The Preferred Reuse Plan also supports the preservation of a natural corridor throughout the station on the lands that are not best suited for new development, including

Table 2-1

PREFERRED REUSE PLAN - ASSUMED LAND USE ACREAGES

Land Use	Acreage	Assumed Maximum Permitted Floor Area Ratio (FAR)[a]
Conservation	641	NA
Forestry	2,835	NA
Forestry/Airport Reserve	4,081	NA
Parks and Recreation	2,943	NA
General Aviation	1,566	NA
Aviation-Related Services	445	0.50
Commercial	207	0.30
Light Industrial	3,455	0.15
Heavy Industrial	1,029	0.15
TOTAL[b]	17,202	NA

[a] Floor area ratio (FAR) is a formula which determines the maximum allowable non-residential building area. The FAR is multiplied by the land area to determine the maximum building area. For example, a 100,000 square-foot parcel with an FAR of 0.10 would permit the construction of a 10,000 square-foot building.

[b] Does not include 179 acres of Navy easements on adjacent property or existing Yellow Water military housing.

Key:

NA = Not applicable; no major development would occur in these areas.

Source: CFDC 1996.

Table 2-2

PREFERRED REUSE PLAN - ASSUMED PHASES OF DEVELOPMENT

Land Use	Phase 1 (1998 - 2004)		Phase 2 (2005 - 2010)		Total - Phases 1 and 2 (1998 - 2010)	
	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)
Aviation	300,000	0	300,000	0	600,000	0
Aviation (Air Cargo)	40,000	0	250,000	0	290,000	0
Aviation (Aircraft Manufacturing and Repair)	100,000	0	200,000	0	300,000	0
Light/Heavy Industrial (Business Park Users)	0	250,000	0	250,000	0	500,000
Commercial	0	0	0	100,000	0	100,000
Heavy Industrial (Manufacturing)	0	250,000	0	500,000	0	750,000
Light Industrial (Warehouse and Distribution)	0	1,000,000	0	1,500,000	0	2,500,000
TOTAL	440,000	1,500,000	750,000	2,350,000	1,190,000	3,850,000

Source: CFDC 1996.

Table 2-3

PREFERRED REUSE PLAN - ESTIMATED AIRCRAFT OPERATIONS[a]

Aircraft Type	Phase 1 Annual Operations (1998-2004)		Phase 2 Annual Operations (2005-2010)	
	Full LTOs	Touch-and-Go Operations	Full LTOs	Touch-and-Go Operations
AH-64	1,450	475	3,300	1,200
UH-60	425	175	875	300
OH-58	1,325	325	875	250
Single Engine Piston	10,000	2,000	15,000	2,500
Twin Engine Piston	10,000	2,000	20,000	2,500
Turbo Prop	15,000	2,000	25,000	2,500
Corporate Jet	15,000	0	20,000	0
Large Jet	5,000	0	10,000	0
TOTAL	58,200	6,975	95,050	9,250

[a] Estimated aircraft operations based upon interviews with potential users of airfield after disposal. Updated estimates of projected operations would be conducted as part of the Airport Master Plan being prepared for the airfield in conjunction with the FAA.

Key:

LTOs = Landing and takeoff cycles.

Source: CFDC 1996.

stream corridors, wetlands, and floodplain areas. The ultimate receiving entity would enter into a memorandum of agreement for use of these areas with FDEP and/or the Florida Department of Agriculture and Consumer Services, Division of Forestry, or develop an overall management plan that would allow public access rights for hiking, camping, and other passive and active recreational activities. This concept would support the creation of a 20-mile long corridor between the Cary State Forest and the Jennings State Forest.

Finally, the land use plan depicts a proposed extension of Brannan Field-Chaffee Road, designed to facilitate traffic flow in the area. This project is not part of the Preferred Reuse Plan, but is shown for illustrative purposes. This project is currently included in the Jacksonville Transportation Improvement Plan (TIP) (see Section 3.8.1).

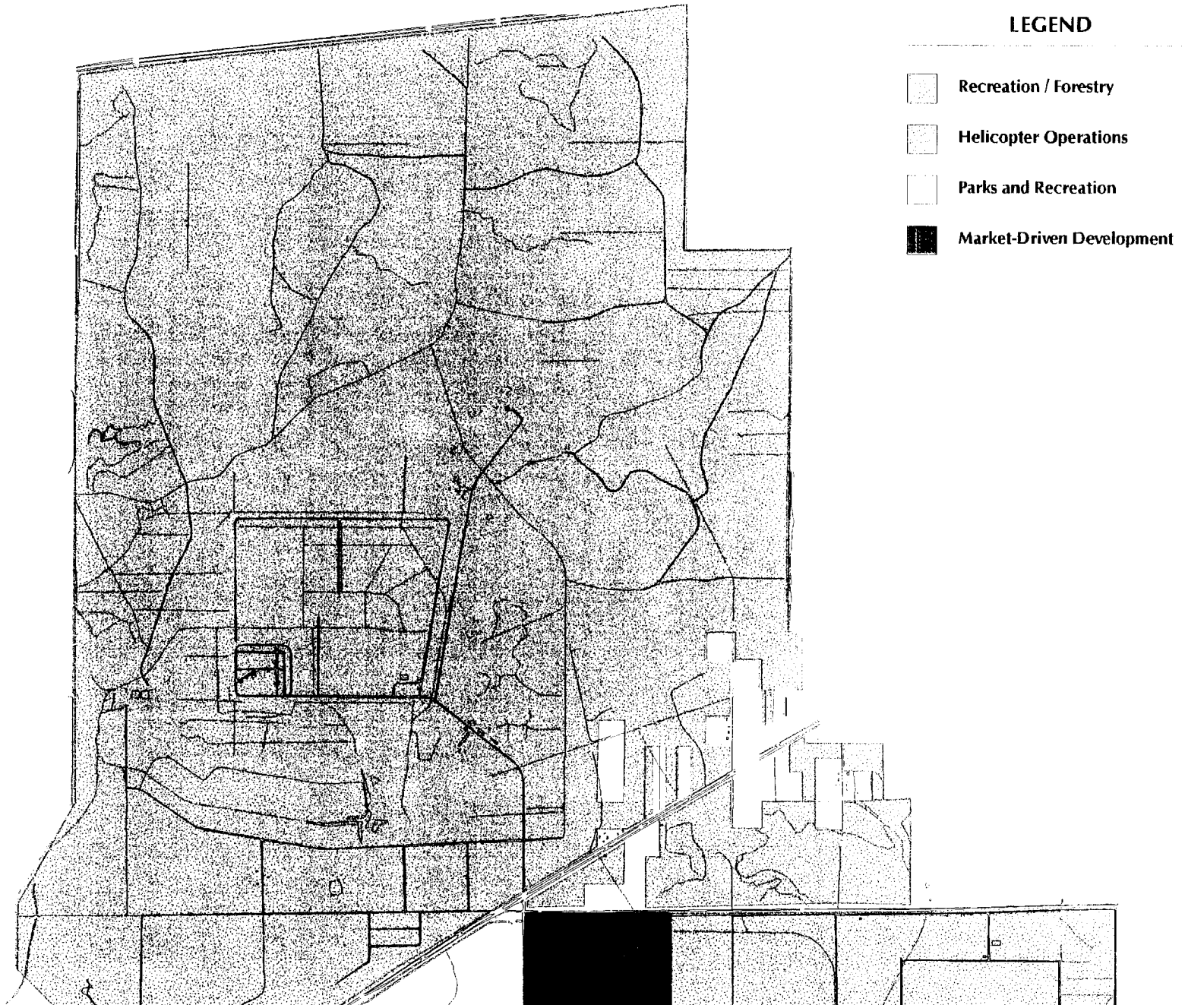
The ultimate receiving entity for the station property would be required to execute a series of future measures in order to implement the Preferred Reuse Plan (CFDC 1996). These measures would include:

- Amendment of the Jacksonville and Clay County comprehensive plans and approval by DCA in accordance with Section 288.03, FS;
- Adoption of land development regulations, landscape standards, and urban design guidelines for the station property; and
- Preparation of detailed plans for resource management and site improvements such as a forestry management plan (derived from existing Navy management practices), a master street plan, a master potable water supply system plan, a master sanitary sewer plan, and a master site drainage plan.

2.2.4 Alternative Reuse Scenario 1

ARS 1 corresponds to the "Continued Public Ownership" concept discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under ARS 1, the local community would have land use and regulatory control over the site but would not be directly involved with the redevelopment of the NAS Cecil Field property. Reuse of the majority of the property would involve various uses such as recreation/forestry, helicopter operations, and parks and recreation. The small balance of the property would be used by private interests for market-driven development.

ARS 1 is illustrated in Figure 2-2. The acreages and assumed FARs controlling future development in each land use category under the plan are presented in Table 2-4. The anticipated amount of reused facilities/new construction over two phases of redevelopment, based upon the CFDC's market analyses, is presented in Table 2-5. It is estimated that reuse of existing facilities and development of new facilities would be limited under ARS 1.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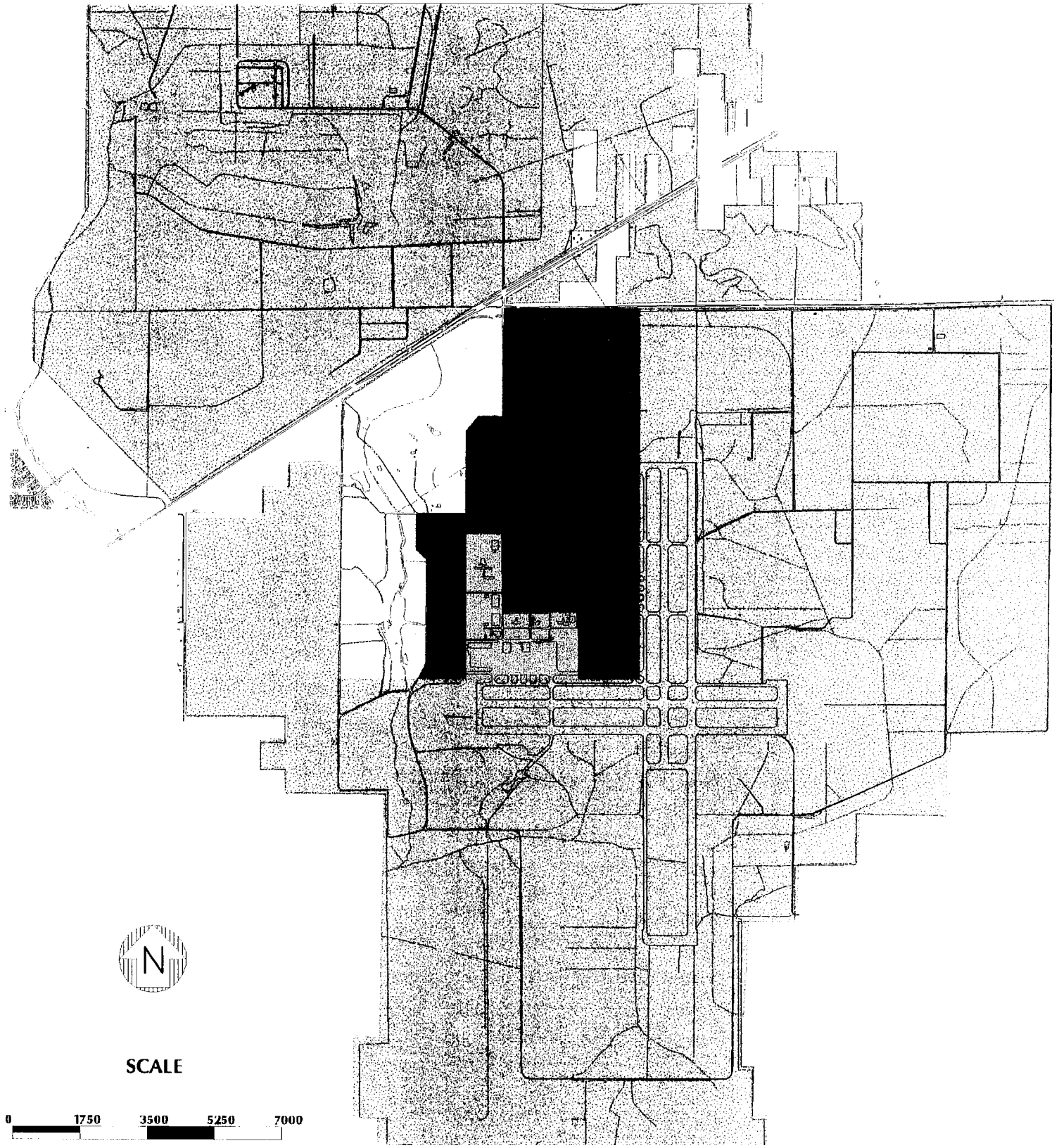
Recreation / Forestry
Helicopter Operations
Parks and Recreation
Market-Driven Development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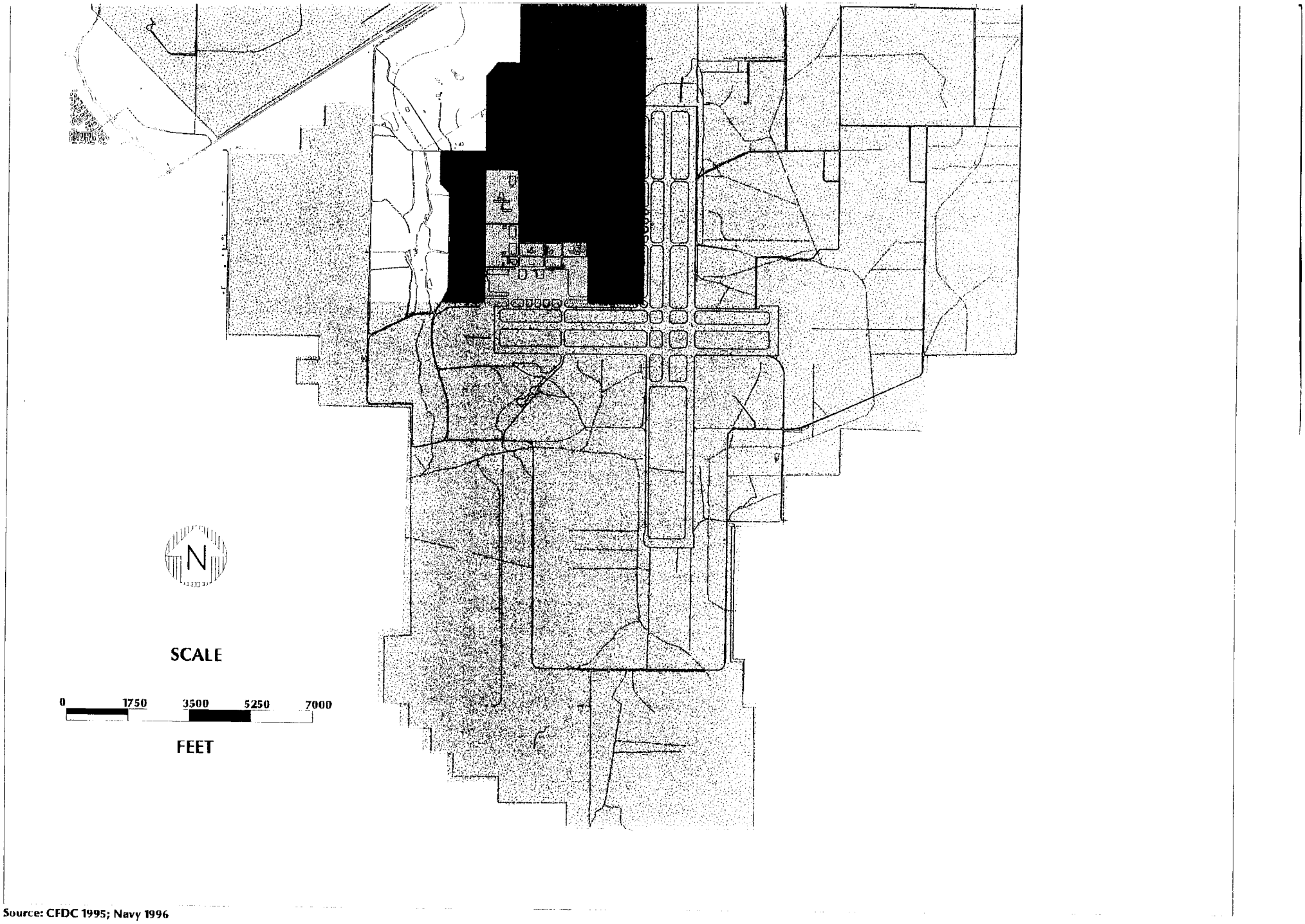


Source: CFDC 1995; Navy 1996

(3)

Figure 2-2 LAND USE PLAN - ARS 1

Table 2-4

ARS 1 - ASSUMED LAND USE ACREAGES

Land Use	Acreage	Assumed Maximum Permitted Floor Area Ratio (FAR)[a]
Recreation/Forestry	15,578	NA
Parks and Recreation	573	NA
Helicopter Operations	158	NA
Market-Driven	893	0.50
TOTAL[b]	17,202	NA

[a] Floor area ratio (FAR) is a formula which determines the maximum allowable building area. The FAR is multiplied by the land area to determine the maximum building area. For example, a 100,000 square-foot parcel with an FAR of 0.10 would permit the construction of a 10,000 square-foot building.

[b] Does not include 179 acres of Navy easements on adjacent property or existing Yellow Water military housing.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no major development would occur in these areas.

Source: Arthur Andersen and Co., *et al.*, n.d.

Table 2-5

ARS 1 - ASSUMED PHASES OF DEVELOPMENT

Land Use	Phase 1 (1998 - 2004)		Phase 2 (2005 - 2010)		Total - Phases 1 and 2 (1998 - 2010)	
	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)
Aviation	300,000	0	0	0	300,000	0
Market-Driven	0	250,000	0	250,000	0	500,000
TOTAL	300,000	250,000	0	250,000	300,000	500,000

Key:

ARS = Alternative Reuse Scenario.

Source: Arthur Andersen and Co., *et al.*, n.d.

Approximately 300,000 square feet of facilities would be reused and 500,000 square feet would be developed by 2010 (CFDC 1996).

The future land use plan under ARS 1 would involve the reuse of existing buildings in the developed area of the Main Station by other entities. Selected aviation facilities and office/personnel space at the Main Station would be used to support helicopter operations.

The NAS Cecil Field golf course and other recreational lands on the Main Station would be reused for parks and recreation areas open to the general public. All other lands and buildings in the developed portion of the Main Station would be used by private interests for market-driven development, which would primarily include office and industrial uses that would be able to capitalize on the reuse of existing facilities.

The balance of the property, consisting of all of the station's several thousand acres of planted pine forest, would be used as a resource-based (i.e., forestry) recreational facility for hiking, camping, and other passive and active recreational facilities. This area would be a portion of a 20-mile long corridor between the Cary State Forest and the Jennings State Forest. Elements of this recreational facility would include a multiple-use trail along the former Yellow Water Area rail right-of-way.

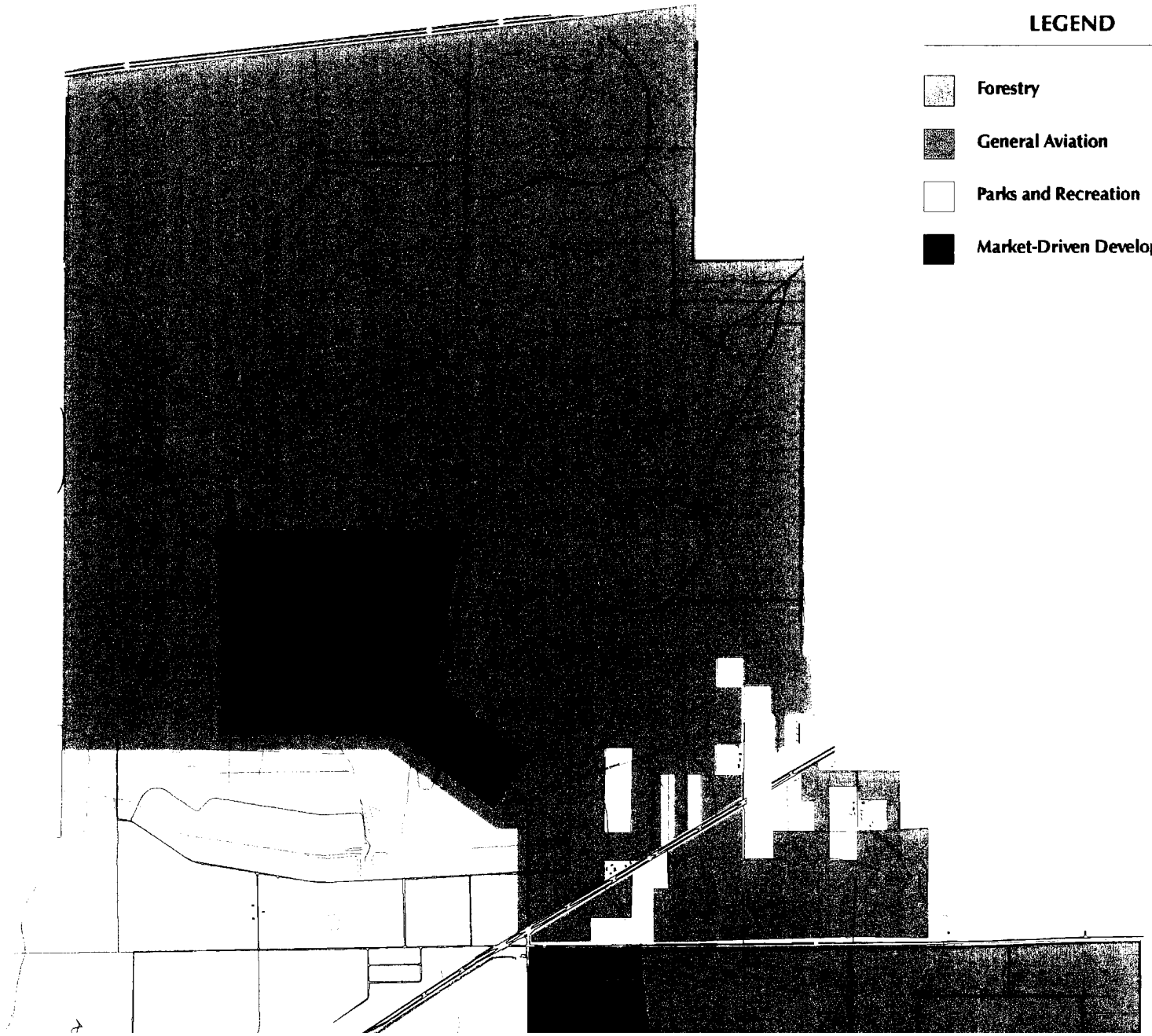
With the exception of facilities associated with potential helicopter operations, no aviation facilities would be utilized (runways, hangars, etc.). These facilities would either be razed or allowed to remain as is, based upon the objectives of the entities that receive them.

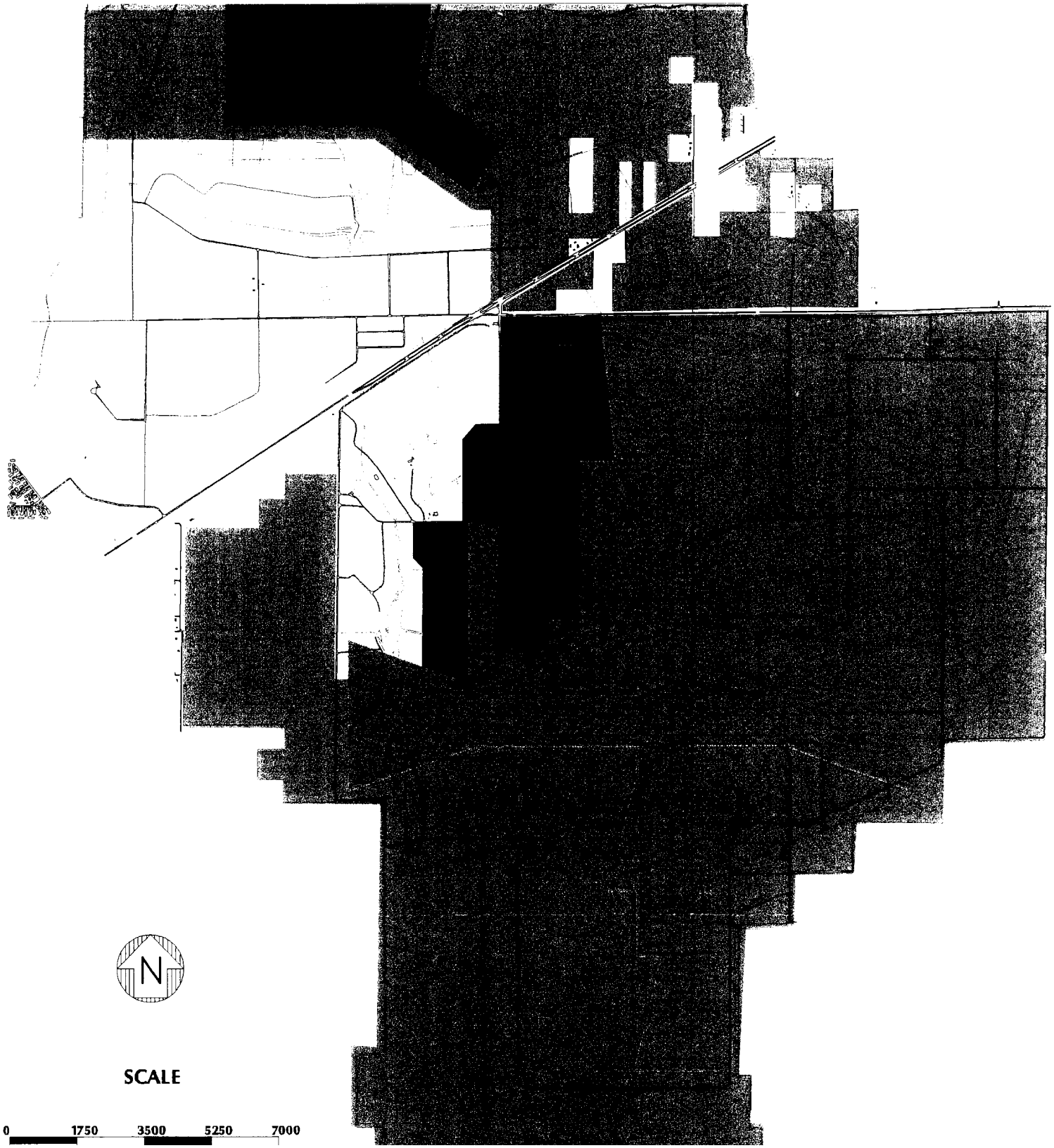
2.2.5 Alternative Reuse Scenario 2

ARS 2 corresponds to the "Local Asset Management" concept discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, only moderate actions would be taken to stimulate reuse of the station. Redevelopment efforts would focus on the developed area of the Main Station to identify new users of existing facilities. The Yellow Water Area would not realize new development other than market-driven development around previously disturbed ordnance storage areas.

ARS 2 is illustrated in Figure 2-3. Acreages and assumed FARs controlling future development in each land use category under the plan are presented in Table 2-6. The anticipated amount of reused facilities/new construction over two phases of redevelopment, based upon the CFDC's market analyses, is presented in Table 2-7. It is estimated that roughly 600,000 square feet of existing facilities would be reused and 500,000 square feet of new facilities would be developed by 2010 (CFDC 1996).

The future land use plan under ARS 2 would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian


LEGEND
Forestry
General Aviation
Parks and Recreation
Market-Driven Development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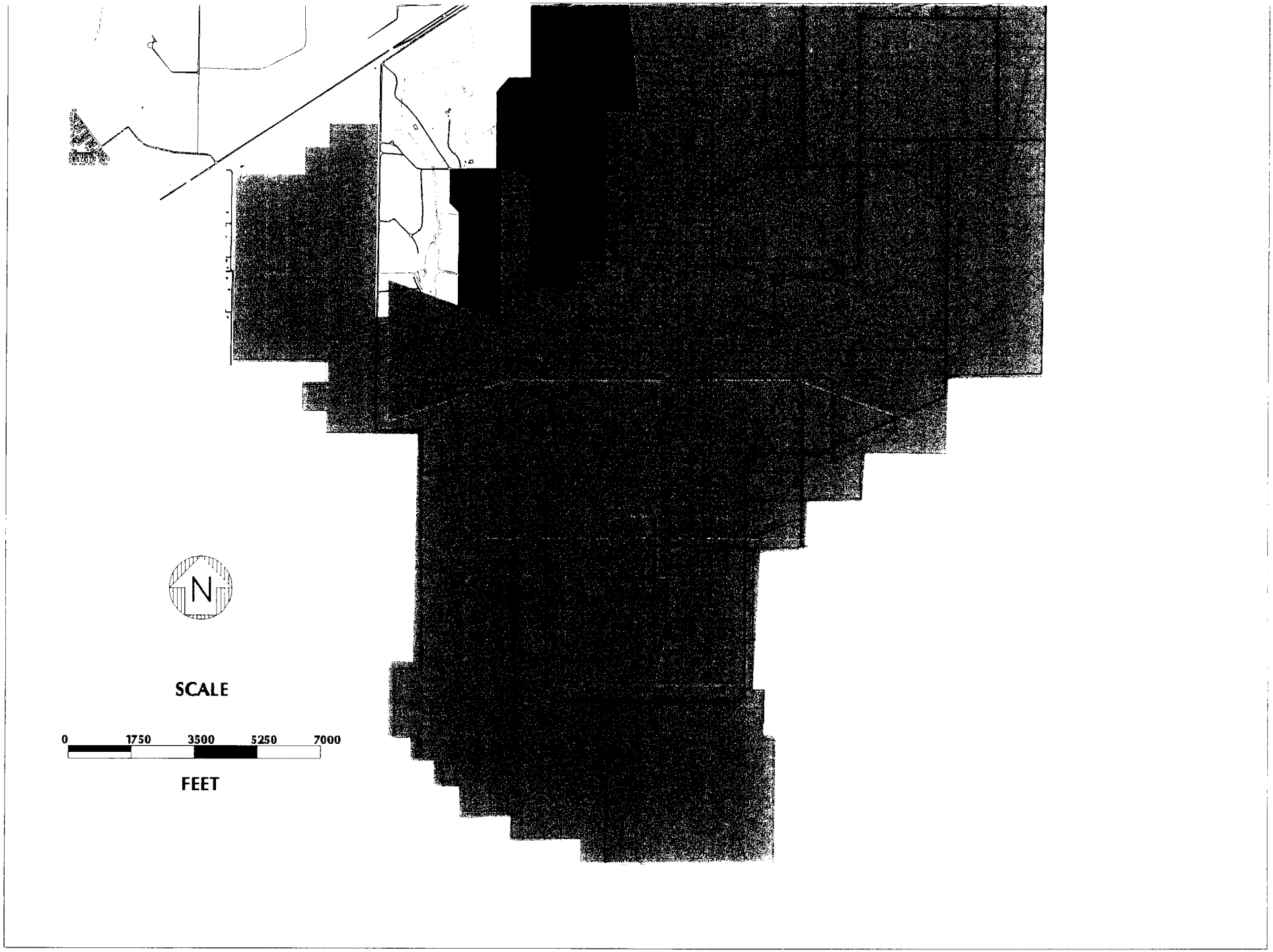


Source: CFDC 1995; Navy 1996

Figure 2-3 LAND USE PLAN - ARS 2

Table 2-6

ARS 2 - ASSUMED LAND USE ACREAGES

Land Use	Acreage	Assumed Maximum Permitted Floor Area Ratio (FAR)[a]
Forestry	11,737	NA
Parks and Recreation	2,332	NA
General Aviation	1,833	0.50
Market-Driven	1,300	0.50
TOTAL[b]	17,202	NA

[a] Floor-area ratio (FAR) is a formula which determines the maximum allowable non-residential building area. The FAR is multiplied by the land area to determine the maximum building area. For example, a 100,000 square-foot parcel with an FAR of 0.10 would permit the construction of a 10,000 square-foot building.

[b] Does not include 179 acres of Navy easements on adjacent property or existing Yellow Water military housing.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no major development would occur in these areas.

Source: Arthur Andersen and Co., *et al.*, n.d.

Table 2-7

ARS 2 - ASSUMED PHASES OF DEVELOPMENT

Land Use	Phase 1 (1998 - 2004)		Phase 2 (2005 - 2010)		Total - Phases 1 and 2 (1998 - 2010)	
	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)
Aviation	300,000	0	0	0	300,000	0
Aviation Manufacturing and Repair	100,000	0	200,000	0	300,000	0
Market-Driven	0	250,000	0	250,000	0	500,000
TOTAL	400,000	250,000	200,000	250,000	600,000	500,000

Key:

ARS = Alternative Reuse Scenario.

Source: Arthur Andersen and Co., *et al.*, n.d.

and military use. Estimated aircraft operations would be similar to those under the Preferred Reuse Plan. ARS 2 includes the reuse of recreational facilities by the general public.

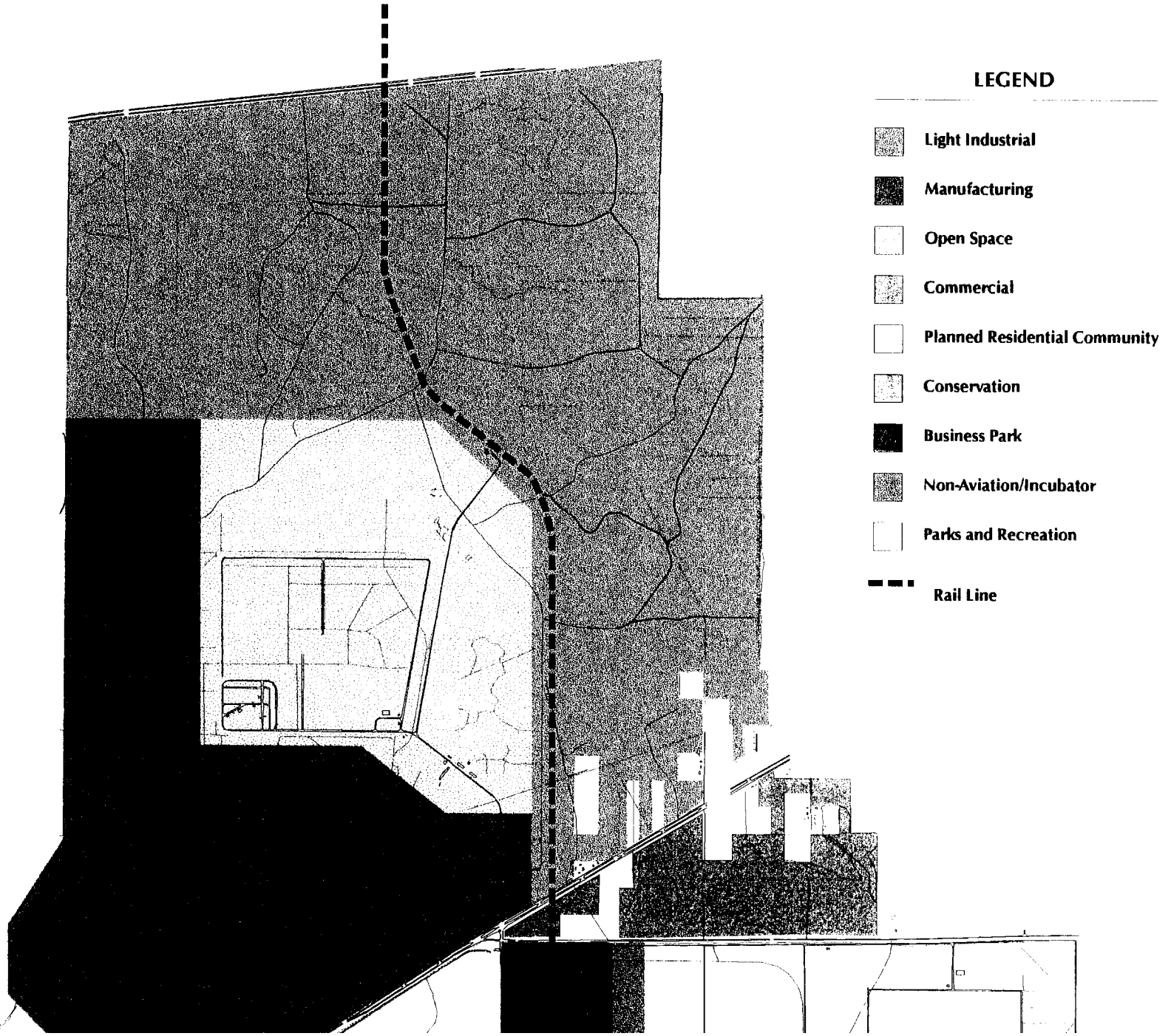
The balance of the property would be used by private land interests for market-driven development. This property would be controlled by local zoning. New development would only be focused on lands south of 103rd Street on the Main Station and former ordnance storage areas in the Yellow Water Area to take advantage of existing infrastructure facilities (i.e., roads, sewer, electric, etc.). Other lands on the Main Station and Yellow Water Area would be used for forestry, consistent with lands west of the site.

2.2.6 Alternative Reuse Scenario 3

ARS 3 corresponds to the "Non-Aviation Mixed Use" concept discussed in the *NAS Cecil Field Final Base Reuse Plan* (CFDC 1996). Under this plan, the ultimate receiving entity would aggressively market and guide redevelopment of the station property for non-aviation use. All aviation facilities would be either renovated for non-aviation use or razed. Job creation would be the primary goal, and significant infrastructure and road improvements would be implemented to foster aggressive development.

ARS 3 is illustrated in Figure 2-4. Acreages and assumed FARs controlling future development in each land use category under the plan are presented in Table 2-8. Anticipated phases of development under the plan, based upon the CFDC's market analyses, are presented in Table 2-9. This ARS is estimated to result in the greatest amount of development, including 3.5 million square feet of new facilities and 3,250 new housing units by 2010 (CFDC 1996).

The future land use plan for ARS 3 would include the development of a variety of residential, commercial, and industrial uses. Land in the eastern portion of the Main Station would be utilized for a new planned residential community. Land south of Normandy Boulevard and north of 103rd Street would be developed for commercial uses to support this residential community. Land in the eastern and northern portions of the Yellow Water Area would be developed for light industrial facilities such as "big box" distributors (e.g., Home Depot, Office Max, etc.), and complemented by the reactivation of the existing railroad line. Land in the western portion of both the Main Station and Yellow Water Area would be developed for manufacturing uses. Finally, the southern portion of the Main Station would be reserved for conservation and mitigation areas to compensate for proposed development in other areas of the station.


LEGEND
Light Industrial
Manufacturing
Open Space
Commercial
Planned Residential Community
Conservation
Business Park
Non-Aviation/Incubator
Parks and Recreation
Rail Line

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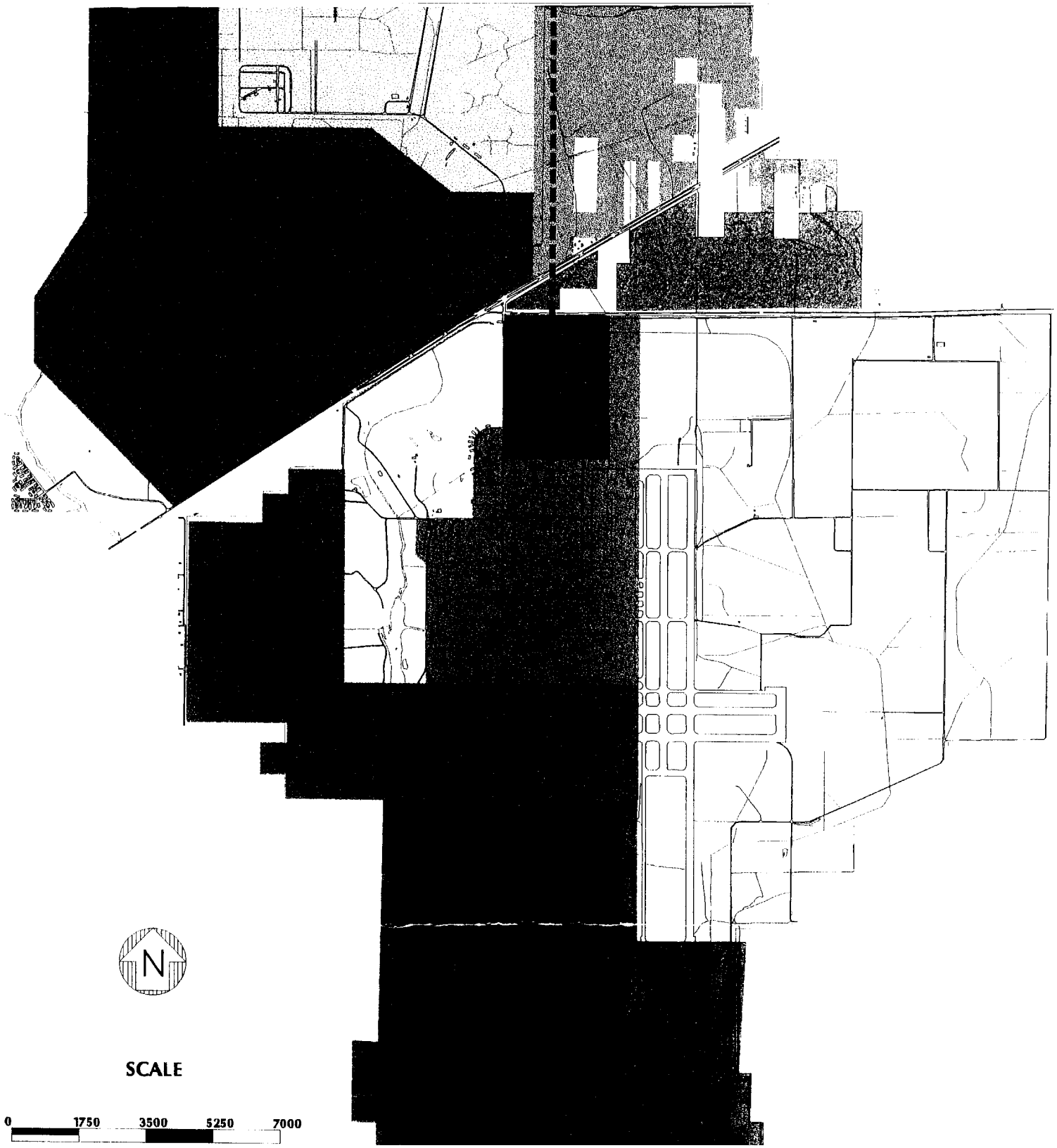
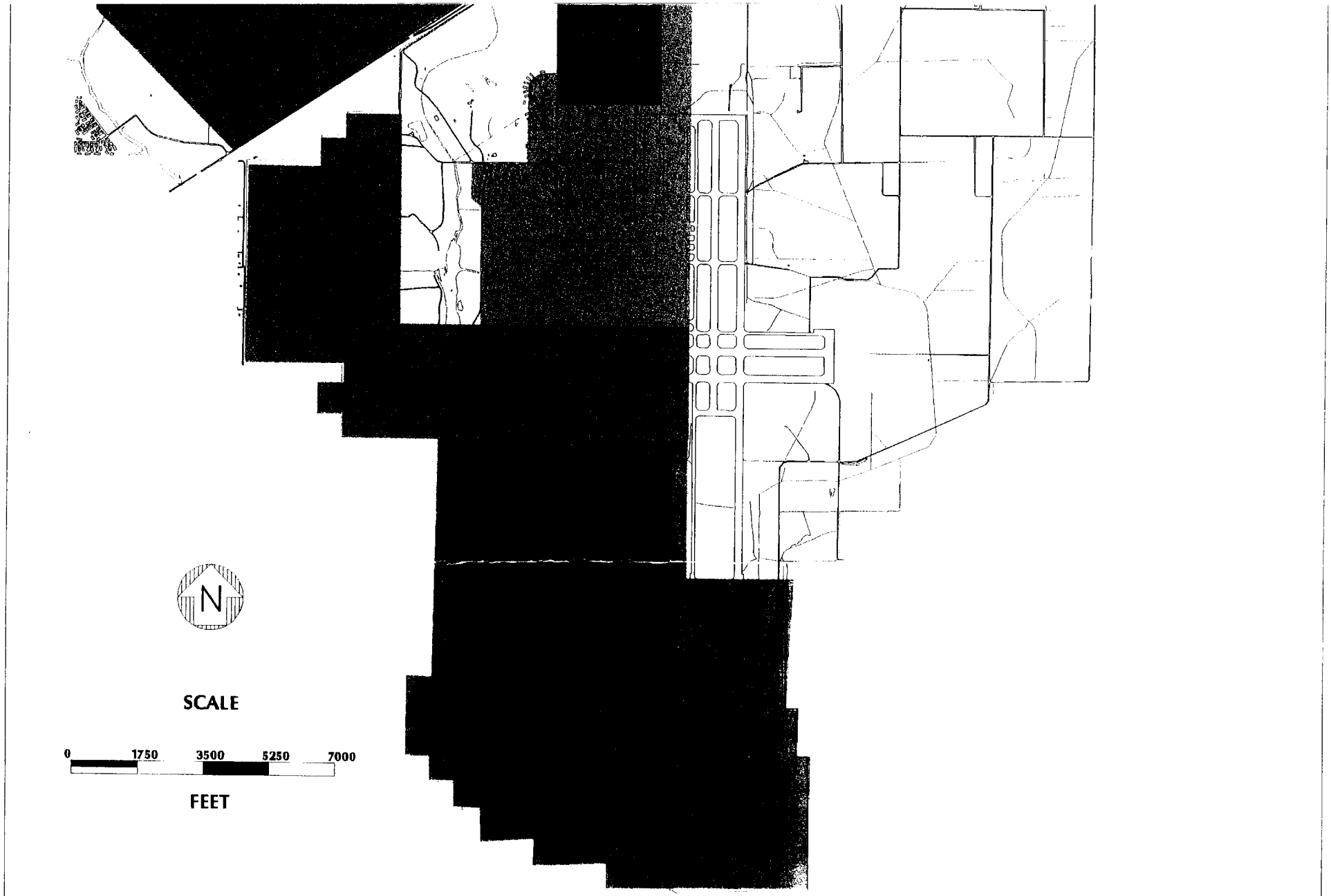




Source: CFDC 1995; Navy 1996

(3)

Figure 2-4 LAND USE PLAN - ARS 3

Table 2-8

ARS 3 - ASSUMED LAND USE ACREAGES

Land Use	Acreage	Assumed Maximum Permitted Floor Area Ratio (FAR)[a]
Conservation	2,291	NA
Open Space	1,574	NA
Parks and Recreation	570	NA
Planned Residential	3,437	NA[b]
Commercial	410	0.30
Business Park	241	0.50
Non-Aviation/Incubator	786	0.50
Light Industrial	4,184	0.15
Manufacturing	3,709	0.15
TOTAL[c]	17,202	NA

[a] Floor area ratio (FAR) is a formula which determines maximum allowable nonresidential building area. The FAR is multiplied by the land area to determine the maximum building area. For example, a 100,000 square-foot parcel with an FAR of .10 would permit a 10,000 square-foot building to be constructed.

[b] No FAR listed because only residential development would occur in this area. Residential density would be approximately 1 unit/5 acres.

[c] Does not include 179 acres of Navy easements on adjacent property or existing Yellow Water military housing.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no major development would occur in these areas.

Source: Arthur Andersen and co., *et al.*, n.d.

Table 2-9

ARS 3 - ASSUMED PHASES OF DEVELOPMENT

Land Use	Phase 1 (1998 - 2004)		Phase 2 (2005 - 2010)		Total - Phases 1 and 2 (1998 - 2010)	
	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)
Business Park Uses	0	250,000	0	300,000	0	550,000
Commercial	0	0	0	200,000	0	200,000
Manufacturing	0	250,000	0	500,000	0	750,000
Light Industrial	0	1,000,000	0	1,000,000	0	2,000,000
Planned Residential	0	NA (750 units)	0	NA (2,500 units)	0	NA (3,250 units)
TOTAL	0	1,500,000	0	2,000,000	0	3,500,000

Key:

ARS = Alternative Reuse Scenario.

Source: Arthur Andersen and Co., *et al.*, n.d.

The developed area of Main Station would be developed into a large-scale business park or business incubator development, and existing buildings and roads would be reused to the greatest extent practicable.

2.2.7 Alternative Reuse Scenario 4

ARS 4 corresponds to an earlier version of the CFDC's Final Reuse Plan for the station that was subsequently amended by the commission in March of 1996 (CFDC 1996). Although no longer the community's preferred reuse plan, it represents a reasonable ARS that was considered by the community. Similar to the Preferred Reuse Plan, ARS 4 would involve aggressively marketing redevelopment of the station property for aviation and other industrial uses. The major difference between ARS 4 and the Preferred Reuse Plan would be the inclusion of two major new institutional facilities under ARS 4.

ARS 4 is illustrated in Figure 2-5. The acreages and assumed FARs controlling future development in each land use category under the plan are presented in Table 2-10. The estimated amount of reused facilities/new construction over two phases of redevelopment, based upon the CFDC's market analyses, are presented in Table 2-11. It is estimated that 1.2 million square feet of existing facilities would be reused and almost 4.6 million square feet of new facilities would be developed under this ARS.

The future land use plan under ARS 4 would include reuse of all aviation facilities (hangars, runways, maintenance buildings, etc.) as a general aviation facility for joint civilian and military use. Anticipated aircraft operations would be similar to those under the Preferred Reuse Plan.

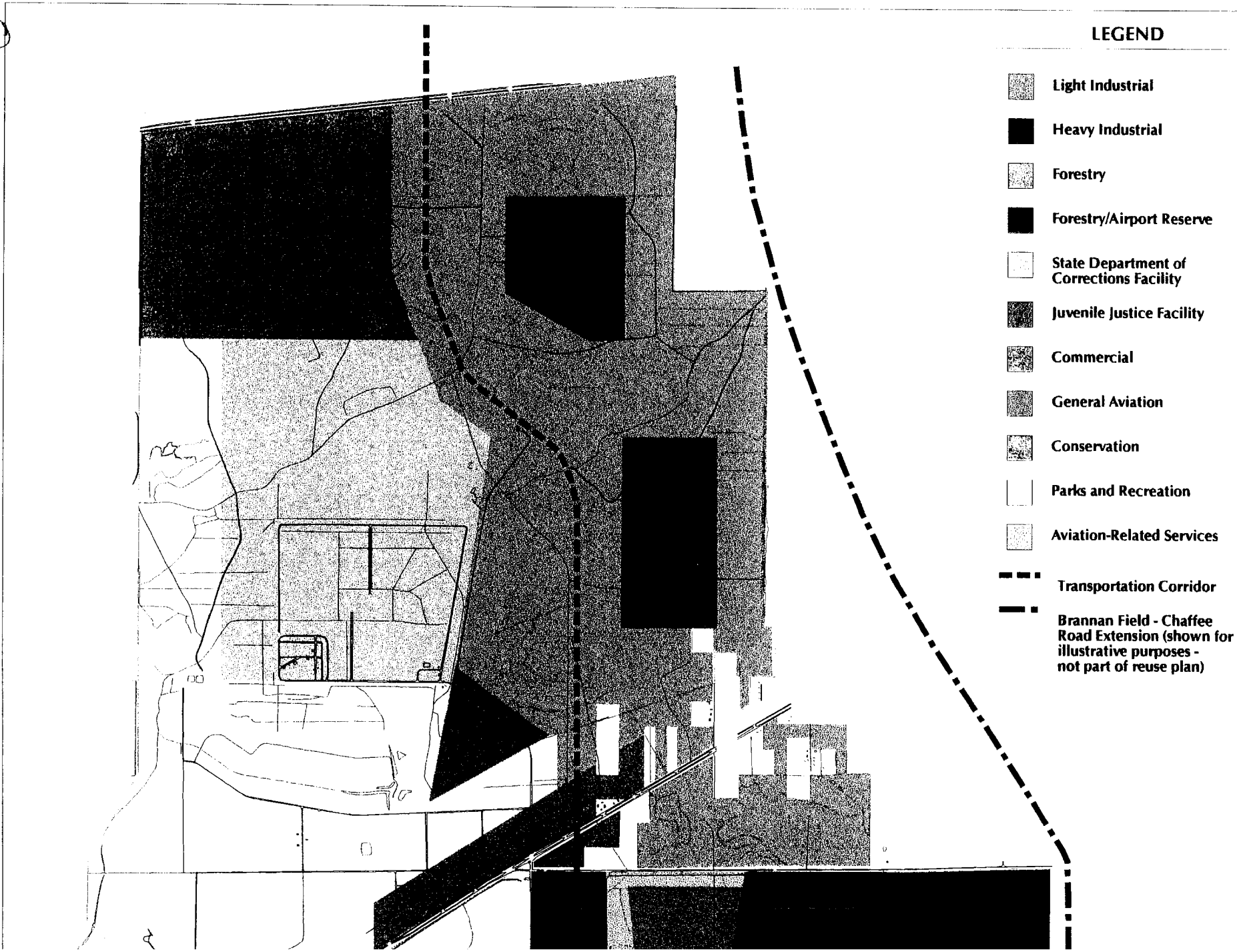
As under the other scenarios, the NAS Cecil Field golf course and other recreational lands on the Main Station and Yellow Water Area would be opened for public use.

The two major institution uses would include:

- Land in the existing ordnance storage areas of the Yellow Water Area, as well as a buffer area surrounding this compound that would be used for the development of a new 5,000-bed state corrections facility; and

- Land and buildings in the southern portion of the Yellow Water Area that would be used for the development of a juvenile justice facility.

The balance of the property would be developed for a variety of industrial and commercial uses. Areas in the eastern portion of the Yellow Water Area and portions of the northwestern and northeastern sides of the Main Station would be developed for light- and


LEGEND
Light Industrial
Heavy Industrial
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Forestry/Airport Reserve
State Department of Corrections Facility
Juvenile Justice Facility
Commercial
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Conservation
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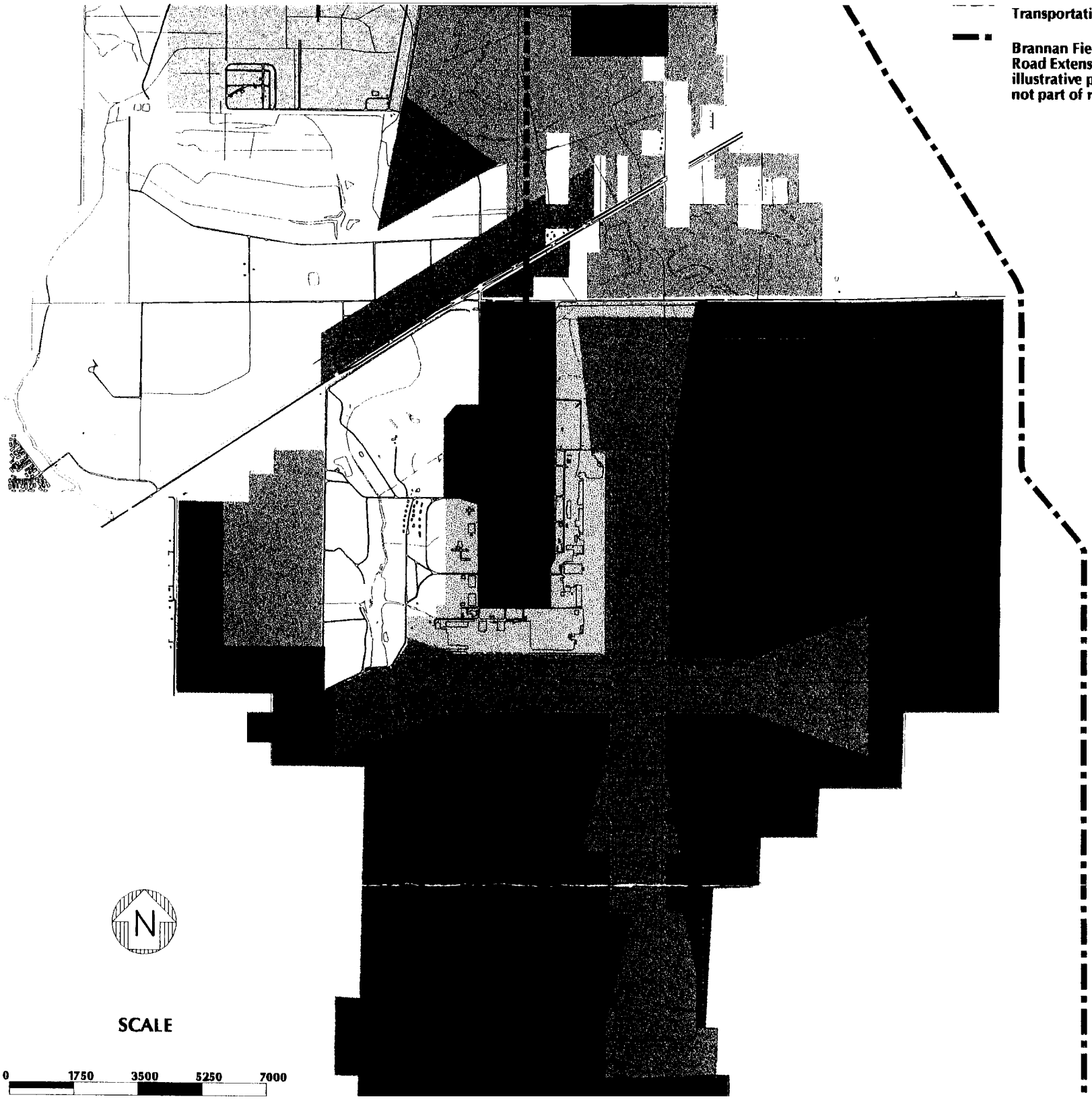
Aviation-Related Services
Transportation Corridor
Brannan Field - Chaffee Road Extension (shown for illustrative purposes - not part of reuse plan)


Transportation Corridor
Brannan Field - Chaffee Road Extension (shown for illustrative purposes - not part of reuse plan)
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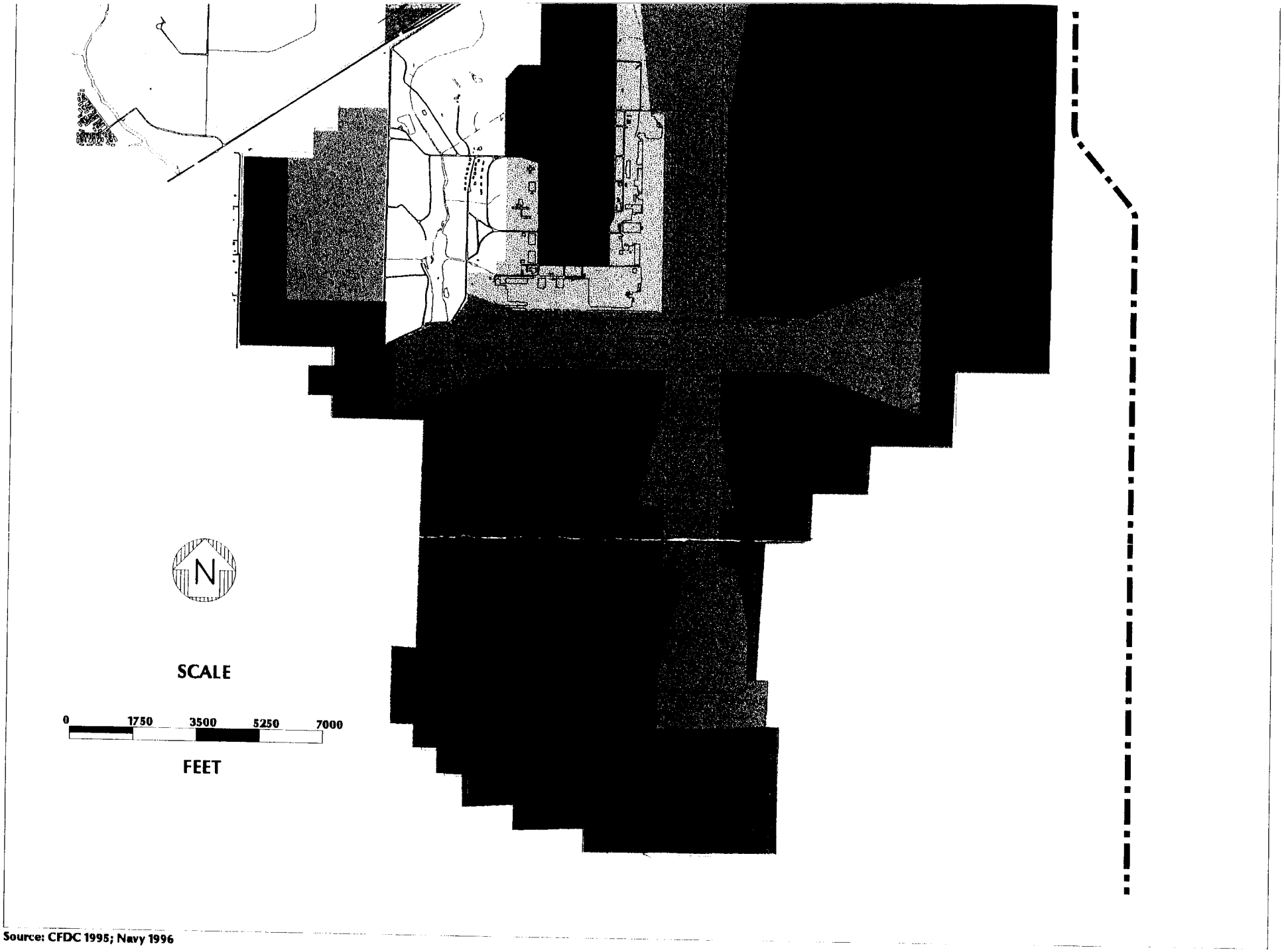


Source: CFDC 1995; Navy 1996

3

Figure 2-5 LAND USE PLAN - ARS 4

Table 2-10

ARS 4 - LAND USE ACREAGE

Land Use	Acreage	Assumed Maximum Permitted Floor Area Ratio (FAR)[a]
Conservation	641	NA
Forestry	980	NA
Forestry/Airport Reserve	4,452	NA
Parks and Recreation	2,955	NA
State Corrections Facility	1,439	0.10
State Juvenile Justice Facility	126	0.15
General Aviation	1,566	NA
Aviation-Related Services	445	0.50
Commercial	207	0.30
Light Industrial	3,362	0.15
Heavy Industrial	1,029	0.15
TOTAL[b]	17,202	NA

[a] Floor-area ratio (FAR) is a formula which determines the maximum allowable nonresidential building area. The FAR is multiplied by the land area to determine the maximum building area. For example, a 100,000 square-foot parcel with an FAR of 0.10 would permit the construction of a 10,000 square-foot building.

[b] Does not include 179 acres of Navy easements on adjacent property or existing Yellow Water military housing.

Key:

NA = Not applicable; no major development would occur in these areas.

Source: Arthur Andersen and Co., *et al.*, n.d.

Table 2-11

ARS 4 - ASSUMED PHASES OF DEVELOPMENT

Land Use	Phase 1 (1998 - 2004)		Phase 2 (2005 - 2010)		Total - Phases 1 and 2 (1998 - 2010)	
	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)	Reused Facilities (Square Feet)	New Facilities (Square Feet)
State Department of Corrections Facility	0	1,000,000	0	0	0	1,000,000
Juvenile Justice Facility	50,000	0	0	0	50,000	0
Aviation	300,000	0	300,000	0	600,000	0
Aviation (Air Cargo)	40,000	0	250,000	0	290,000	0
Aviation (Aircraft Manufacturing and Repair)	100,000	0	200,000	0	300,000	0
Light/Heavy Industrial (Business Park Uses)	0	250,000	0	250,000	0	500,000
Commercial	0	0	0	100,000	0	100,000
Heavy Industrial (Manufacturing)	0	250,000	0	500,000	0	750,000
Light Industrial (Warehouse and Distribution)	0	1,000,000	0	1,500,000	0	2,500,000
TOTAL	490,000	2,500,000	750,000	2,350,000	1,240,000	4,850,000

Key:

ARS = Alterntive Reuse Scenario.

Source: Arthur Andersen, Co., *et al.* n.d.

heavy-industrial uses. Commercial development would be focused on the northern and southern frontages of Normandy Boulevard. Finally, the northwestern portion of the Yellow Water Area would be used for forestry management.

Within the developed area of the Main Station, a significant amount of demolition would occur to clear large areas for the development of heavy industrial uses such as assembly shops for automotive and aviation parts. A series of existing barracks and classroom/office facilities would be retained for use as a conference/training center for companies that locate on the property.

2.3 Other Alternatives Considered But Not Included

2.3.1 No-Action Alternative

The no-action alternative would include the closure of NAS Cecil Field, with the Navy maintaining the facility in caretaker status in perpetuity. No transfers of land to other entities would occur.

This alternative would be contrary to the intent of the President's five-part-plan to revitalize base closure communities, which encourage economic redevelopment of former military bases to offset the effects to host communities. Holding NAS Cecil Field in caretaker status would not benefit the community; therefore, this alternative was dismissed from further consideration.

2.3.2 The Global Airport

Under this alternative, the Main Station and the Yellow Water Area would be ultimately developed into a global airport or world port, designed to accommodate future hypersonic aircraft for transoceanic travel (Arthur Andersen and Co. n.d.). This would require land-banking the majority of the station with limited interim uses until development of the airport facilities is feasible (i.e., 15 to 20 years after closure of Cecil Field, or approximately 2018). Phasing of this alternative would be largely dependent on the development of new hypersonic aircraft technology and the suitability of Cecil Field as a site to handle such aircraft.

The plan would involve future use of the entire Main Station and the Yellow Water Area for the global airport. Significant improvements would include: a high-speed rail connection between Jacksonville International Airport and Cecil Field; new cargo and passenger terminals; reuse or construction of new facilities for maintenance and support; and extension

of one runway and construction of three new runways (requiring acquisition of lands adjoining Cecil Field to accommodate longer runway lengths for hypersonic aircraft).

Among many other regulatory issues, it should be noted that implementation of such a project would require approval/permitting from the FAA. Such approvals would be a major federal action requiring subsequent NEPA documentation. Such efforts and the delayed implementation render this alternative unfeasible and eliminate it from further consideration in this DEIS.

From an environmental impact perspective, prior to the development of the global airport, uses under this alternative would be similar to uses specified under ARS 1 (e.g., forestry and recreational uses). The only difference would be the ultimate relinquishment of such uses in the long term to allow for the global airport development. Therefore, the effects of such a scenario would be covered sufficiently in this DEIS.

2.4 Comparison of Alternatives and Selection of Preferred Alternative

Table 2-12 summarizes the environmental effects of the proposed action and each ARS. These effects are discussed in greater detail in Section 4. Of the alternatives considered, ARS 1 would have the fewest impacts on the environment based on the limited amount of development and predominant designation for passive recreational use and forestry. Consequently, ARS 1 would result in the least amount of beneficial socioeconomic impact in terms of new jobs and revenues to offset the effects associated with closure of the station. ARS 3 would result in the greatest potential environmental impacts, most of which would be associated with greater traffic effects resulting from the relatively aggressive approach to development.

The Preferred Reuse Plan would result in minor to moderate environmental impacts while resulting in reasonable job retention/creation and revenue generation. Therefore, the CFDC selected the aviation mixed-use concept as the Final Base Reuse Plan to guide redevelopment of the station. In turn, the Navy has identified this as the Preferred Reuse Plan for the purposes of this DEIS.

Table 2-12

COMPARISON OF ENVIRONMENTAL IMPACTS
NAS CECIL FIELD

Resource	Preferred Reuse Plan	Alternative Reuse Scenario 1	Alternative Reuse Scenario 2	Alternative Reuse Scenario 3	Alternative Reuse Scenario 4
Land Use and Aesthetics	Minimal adverse impacts. Land uses generally consistent and compatible. Specific impacts would be mitigated through local development review process.	Minimal adverse impacts. Little new development would occur. Specific impacts would be mitigated through local development review process.	Minimal adverse impacts. Land uses generally consistent and compatible. Specific impacts would be mitigated through local development review process.	Moderate adverse impacts. Greatest level of planned development among alternatives. Potential for minor internal land use conflicts between residential and industrial uses. Specific impacts would be mitigated through local development review process.	Minimal adverse impacts. Land uses generally consistent and compatible. Potential for minor land use conflicts between corrections facilities and industrial uses. Specific impacts would be mitigated through local development review process.
Geology, Topography, and Soils	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
Terrestrial Resources	Minor impacts in the short term and potentially significant impacts in the long term, depending on location and layout of specific development proposals. Sensitive areas can be avoided and impacts mitigated.	No significant impacts.	No significant impacts.	Minor impacts in the short term and potentially significant impacts in the long term, depending on location and layout of specific development proposals. Sensitive areas can be avoided and impacts mitigated.	Minor impacts in the short term and potentially moderate impacts in the long term, depending on location and layout of specific development proposals. Sensitive areas can be avoided and impacts mitigated.
Water Quality	No significant adverse impacts. Potential for beneficial impacts to surface water and groundwater quality.	No significant adverse impacts. Potential for beneficial impacts to surface water and groundwater quality.	No significant adverse impacts. Potential for beneficial impacts to surface water and groundwater quality.	No significant adverse impacts. Potential for beneficial impacts to surface water and groundwater quality.	No significant adverse impacts. Potential for beneficial impacts to surface water and groundwater quality.

Table 2-12

COMPARISON OF ENVIRONMENTAL IMPACTS
NAS CECIL FIELD

Resource	Preferred Reuse Plan	Alternative Reuse Scenario 1	Alternative Reuse Scenario 2	Alternative Reuse Scenario 3	Alternative Reuse Scenario 4
Air Quality	Short-term dust emissions during construction. Moderate long-term increase in CO emission resulting from traffic.	No significant impacts.	No significant impacts.	Significant long-term CO emission increase resulting from new traffic generation. Short-term increases in fugitive dust emissions during construction.	Moderate long-term increases in CO emissions resulting from traffic generated. Short-term increases in fugitive dust emissions during construction.
Noise	Continued effects of airport related noise but lower than pre-closure levels.	Minor noise impacts associated with helicopter operations only; however, lower than pre-closure levels and other alternatives.	Continued effects of airport-related noise, but much lower than current levels.	No significant impacts. No airport-related noise would occur, because all airport facilities would be dismantled.	Continued effects of airport-related noise, but much lower than pre-closure levels.
Socioeconomics/Community Services	Moderate beneficial impacts. Approximately 6,700 jobs created, $145 million in direct/indirect income generated, and $2,164,758 in tax revenue generated. No significant impacts on housing market, schools, or emergency/medical services. Significant beneficial impacts on public recreational services.	Minimal beneficial impacts. Approximately 1,300 jobs created, $33 million in direct/indirect income generated, and $520,292 in tax revenue generated. No significant impacts on local housing market, schools, or emergency/medical services. Significant beneficial impacts on publicly available recreational activities	Minor beneficial impacts. Approximately 2,800 jobs created, $72 million in direct/indirect income generated, and $639,958 in tax revenue generated. No significant impacts on local housing market, schools, or emergency/medical services. Significant beneficial impacts on publicly available recreation activities.	Moderate beneficial impacts. Approximately 4,746 jobs created, $94 million in direct/indirect income generated, and $7,520,376 in tax revenue generated. Moderate impact on local housing market as a result of the development of 3,250 residential units. Minor impacts on schools and emergency/medical services. Significant beneficial impacts on publicly available recreational activities.	Significant beneficial impacts. Approximately 10,000 jobs created, $210 million in direct/indirect income generated, and $2,164,758 in tax revenue generated. Minor impact on local housing market, schools, and emergency/medical services. Significant beneficial impacts on publicly available recreational activities.

Table 2-12

COMPARISON OF ENVIRONMENTAL IMPACTS
NAS CECIL FIELD

Resource	Preferred Reuse Plan	Alternative Reuse Scenario 1	Alternative Reuse Scenario 2	Alternative Reuse Scenario 3	Alternative Reuse Scenario 4
Transportation	Moderate adverse impacts would result from traffic volumes (14,239 at full buildout), potential loss of mass transit service during initial phases of redevelopment, moderate long-term deterioration of LOS, or potential need for improved on- and off-station roadways. Air traffic significantly reduced from pre-closure levels.	Minor adverse impact would result from traffic volumes (11,226 at full build out) or potential loss of mass transit service. No significant impact on LOS on- or off-station. Air traffic significantly reduced from pre-closure levels; limited only to helicopter operations.	Minor adverse impact would result from traffic volumes (9,263 at full build out) or potential loss of mass transit service. Minor deterioration of LOS on certain off-station roads. Air traffic significantly reduced from pre-closure levels.	Significant adverse impacts would result from traffic volumes (48,398 at full build out), potential loss of mass transit service during initial phases of redevelopment or deterioration of on- and off-station LOS. No impacts on air traffic; all air facilities would be dismantled.	Moderate adverse impacts would result from traffic volumes (27,268 at full build out), potential loss of mass transit service during initial phases of redevelopment, moderate long-term deterioration of LOS, or potential need for improved on- and off-station roadways. Air traffic significantly reduced from pre-closure levels.
Infrastructure and Utilities	No significant impacts to utility infrastructure and capacity in short term. Long-term redevelopment may require significant improvements in water and sewer infrastructure and storm water management systems. Usage lower than pre-closure levels.	No significant impacts.	No significant impacts to utility infrastructure and capacity in short term. Long-term redevelopment may require significant improvements in water and sewer infrastructure and storm water management systems. Usage lower than pre-closure levels.	No significant impacts to utility infrastructure and capacity in short term. Long-term redevelopment may require significant improvements in water and sewer infrastructure, and storm water management systems. Usage lower than pre-closure levels.	No significant impacts to utility infrastructure and capacity in short term. Long-term redevelopment may require significant improvements in water and sewer infrastructure and storm water management, systems. Usage lower than pre-closure levels.
Environmental Contamination	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.

Table 2-12

COMPARISON OF ENVIRONMENTAL IMPACTS
NAS CECIL FIELD

Resource	Preferred Reuse Plan	Alternative Reuse Scenario 1	Alternative Reuse Scenario 2	Alternative Reuse Scenario 3	Alternative Reuse Scenario 4
Cultural Resources	Minor potential for affecting sensitive archaeological areas. Most sensitive areas are designated for no future development.	No significant impacts.	No significant impacts.	Greatest potential for affecting sensitive archaeological areas through significant new construction.	Minor potential for affecting sensitive archaeological areas. Most sensitive areas are designated for no future development.
Environmental Justice	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.

Key:

LOS = Level of service.
NO_x = Oxides of nitrogen.

3 Description of Affected Environment

This section describes the existing environmental resources at NAS Cecil Field that may influence or be affected by the Navy's disposal of the station and its subsequent reuse. This information was compiled through:

- A review of existing documentation for the station such as the station master plan, integrated natural resource inventory, and wetlands inventory;
- Site reconnaissance visits;
- A review of local, regional, state, and federal inventories, plans, policies, and regulations influencing development at the station; and
- Discussions with local, regional, state, and federal governmental personnel and private entities having jurisdiction over or responsible for environmental, planning, and infrastructure regulation or services in the vicinity of the station.

Where appropriate, individual discussions are provided for the Main Station and the Yellow Water Area. No discussion is provided for OLF Whitehouse or the Pinecastle Target Complex (i.e., Pinecastle Range, Rodman Range, and Lake George Range) because they are not slated for disposal by the Navy. Because of its proximity to lands to be disposed, a cursory review of resources in the Yellow Water Family Housing Area is provided under discussions of the Yellow Water Area.

3.1 Land Use and Aesthetics

3.1.1 Existing Land Use

NAS Cecil Field contains approximately 487 buildings and structures, which total approximately 3,330,000 square feet of space and accommodate a wide variety of military aviation and support uses. In addition, a large portion of the station is devoted to agricultural

uses, specifically forestry and grazing activities. Land use characteristics for each of these areas is described in the following sections.

3.1.1.1 Main Station

Existing land use patterns on the Main Station primarily result from the location and orientation of the station's two sets of bisecting, parallel runways (see Figure 3-1). The location of the runways requires that certain areas of the Main Station be used for air operations activities such as air support, aircraft-noise impact zones, and air safety zones (Navy 1988). Other land use factors that have influenced the development patterns on the Main Station include environmental constraints, capital investment and infrastructure constraints, and explosive safety quantity distance (ESQD) arcs, which are designated safety areas around magazine and ordnance-handling facilities.

The majority of the Main Station is undeveloped and primarily used to support air-safety approach zones, ESQD arcs, and forestry activities (i.e., pine plantations) (Navy 1988). Developed areas of the Main Station are concentrated in its northwest section and comprise approximately 1,000 acres. Land use in this area can be generally categorized as support facilities and official military mission facilities (see Figure 3-2).

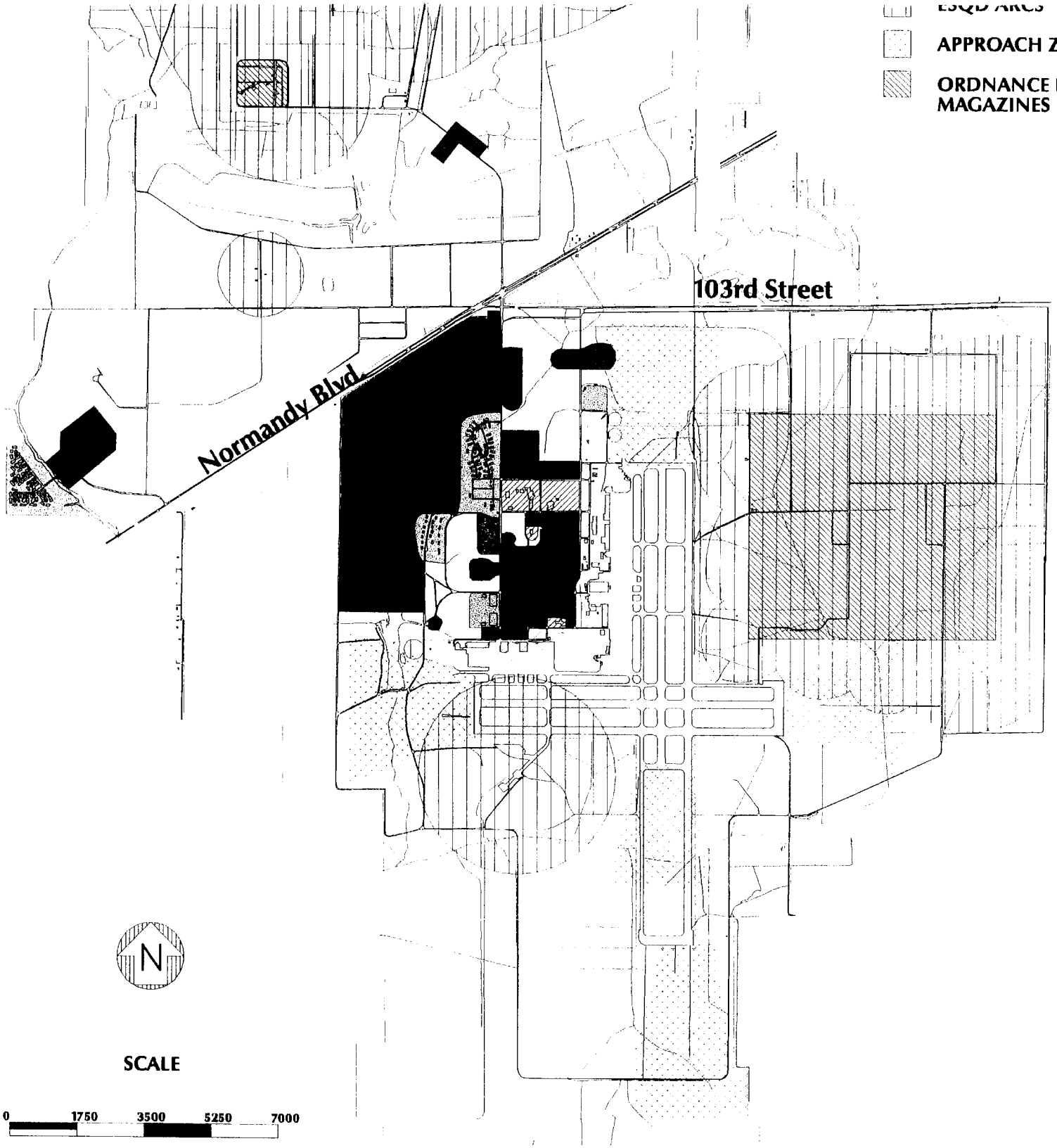
Support Facilities

In general, support facilities such as family housing, medical, religious, recreation, and commercial/retail uses are located west of "A" Avenue and north of 4th Street. The area just south of 9th Street near the family enlisted housing is the core of personnel support and includes commercial uses such as the credit union, library, bowling alley, package store, and the exchange. Medical/dental and religious facilities are situated south of 6th Street along "D" Avenue.

Residential uses in the developed area of the Main Station consist of family housing areas, Bachelor Officers Quarters (BOQ) and Bachelor Enlisted Quarters (BEQ). These facilities include:

- A 97-unit family housing area in the western portion of the developed area of the Main Station, consisting of 38 duplexes and 21 single-family units;
- A trailer area along "D" Avenue containing 48 trailer pads;
- A BOQ located along "D" Avenue containing 131 units; and


LEGEND
BEQ/BOQ
FAMILY HOUSING
SUPPLY
ADMINISTRATION
OPEN SPACE /FORESTRY
MEDICAL/RELIGIOUS
TRAINING
PUBLIC WORKS/UTILITIES
RECREATION
AIR OPERATIONS
PERSONNEL SUPPORT
ESQD ARCS
APPROACH ZONES
ORDNANCE HANDLING/ MAGAZINES
103rd Street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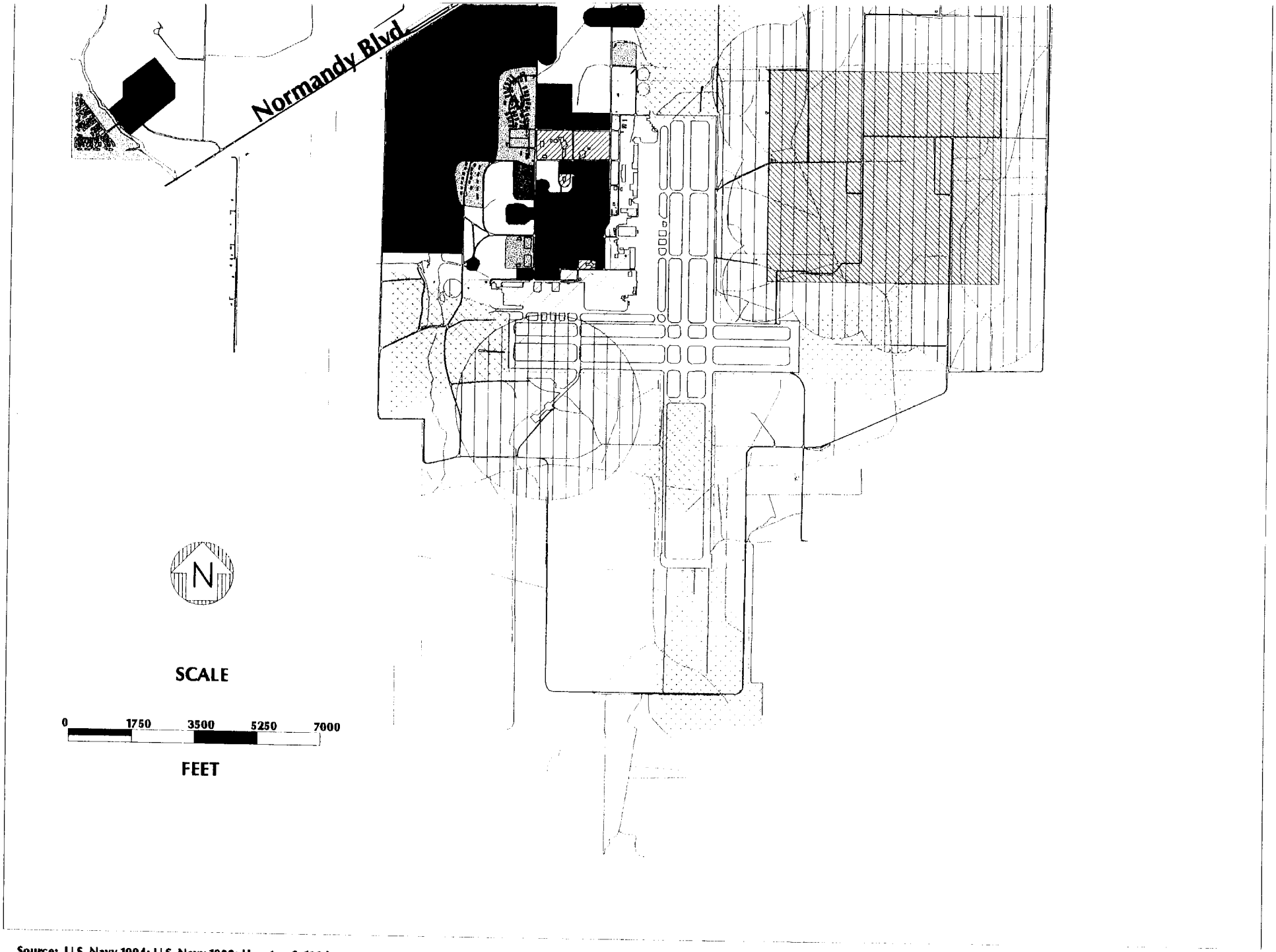
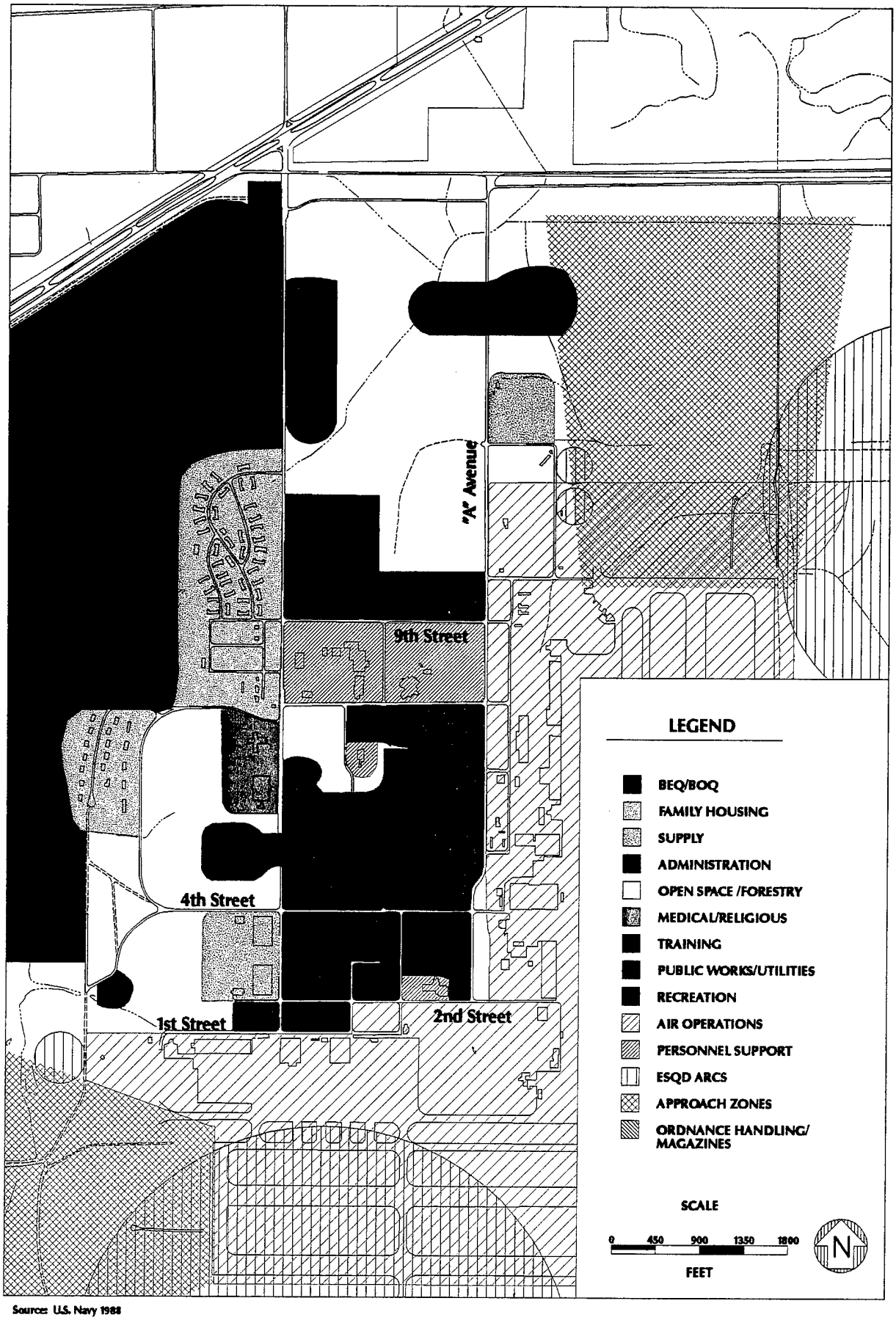


Source: U.S. Navy 1994; U.S. Navy 1988; Houston,S.,1994

(3)

FIGURE 3-1 EXISTING LAND USE MAIN STATION/YELLOW WATER



Source: U.S. Navy 1988

FIGURE 3-2 EXISTING LAND USE - DEVELOPED AREA OF MAIN STATION

- Twenty-one BEQ barracks located in three areas, along "D" Avenue, north of 9th Street, and between "B" Circle and "A" Avenue.

Recreational land uses are situated at various locations of the Main Station and consist of both active and passive facilities. These facilities include:

- Lake Newman, located west of the developed area of the Main Station, which supports activities such as recreational fishing, and has associated facilities such as a clubhouse, four camp sites with electricity and water facilities, a 25-meter swimming pool (Building 342), and a skeet range;

- Lake Fretwell, located at the western end of 4th Street, which supports boating and has associated facilities such as a recreation area, boat rental facility, softball fields, picnic areas, and three pavilions;

- An 18-hole golf course near Lake Newman with clubhouse and snack bar facilities;

- Indoor facilities, such as a 25-meter swimming pool (Building No. 281), a gymnasium with a weight room (Building No. 498), racquetball and basketball courts, and a 16-lane bowling alley; and

- Picnic areas and active recreational facilities such as baseball diamonds, basketball courts, tennis courts, and volleyball courts located in various areas in the developed portion of the Main Station.

Official Military Mission Facilities

Facilities associated with the official military mission (such as air operations, training, supply and administration) are located east of "A" Avenue and south of 4th Street (Navy 1988). These uses are primarily associated with air operations and are concentrated east of "A" Avenue and south of 1st Street. Facilities in this area include two sets of parallel aircraft runways, eight hangars, the Air Traffic Controller/Disaster Preparedness Center, fuel areas, vehicle parking areas, aircraft parking aprons, and the Aviation Intermediate Maintenance Detachment Facility (Building Nos. 824 and 313). Additional facilities in support of the official military mission are located between 1st and 4th streets and include training, supply, administration, and utilities.

3.1.1.2 Yellow Water Area

The majority of land at the Yellow Water Area is categorized as open space and ordnance storage with associated ESQD arcs (see Figure 3-1). There are two magazine storage locations consisting of 21 magazines and 40 magazines. An approximately 12-acre

paved area separates the magazine storage sites. A small support area is located along the main road leading to the ordnance storage area. The support area includes an unoccupied BEQ with a mess hall and clubhouse, maintenance and operation facilities, and personnel support and recreation facilities. The occupied, 200-unit Yellow Water Family Housing Area and an adjacent recreational area are located in the southwest portion of the Yellow Water Area (Navy 1988).

3.1.2 Surrounding Land Use

Existing land use in the vicinity of NAS Cecil Field is depicted on Figure 3-3. In general, areas surrounding the station are sparsely developed and characterized predominantly by agricultural uses consisting of forestry activities, grazing lands, cropland, and open land.

Residential uses consist of scattered, low-density, single-family development along Halsema Road, Normandy Boulevard, and east of the Main Station and Yellow Water Area along 103rd Street, Old Middleburg Road, and Crystal Springs Road (Jacksonville Planning and Development Department 1990).

Recreational uses in the area include: Pope Duval Park, located directly north of the Yellow Water Area, Brannan Field Mitigation Park, located southeast of the Main Station, and the Jenning Forest Wildlife Management Area, located southwest of the Main Station.

In compliance with the Conservation/Coastal Management Element of the 2010 Comprehensive Plan, the City of Jacksonville has proposed to create a special management area (Northeast Florida Regional Mitigation Park) to protect a tract of significant natural habitat before it is developed by private interests. Located to the southeast of NAS Cecil Field, developers would be able to purchase mitigation credits from this mitigation bank to compensate for impacts caused by other development projects (Jacksonville Planning and Development Department 1990).

Commercial uses in the area are scattered along Normandy Boulevard and 103rd Street near the station. These uses consist mainly of general commercial development in close proximity to the station, such as automobile salvage yards, general retail, and heavy commercial uses such as a concrete products company. More consumer-oriented commercial uses exist along Normandy Boulevard and 103rd Street near their intersections with I-295.

Other major land uses in the vicinity of the station include:

- Herlong Airport, a general aviation facility located 4.5 miles northeast of the Main Station along Normandy Boulevard;

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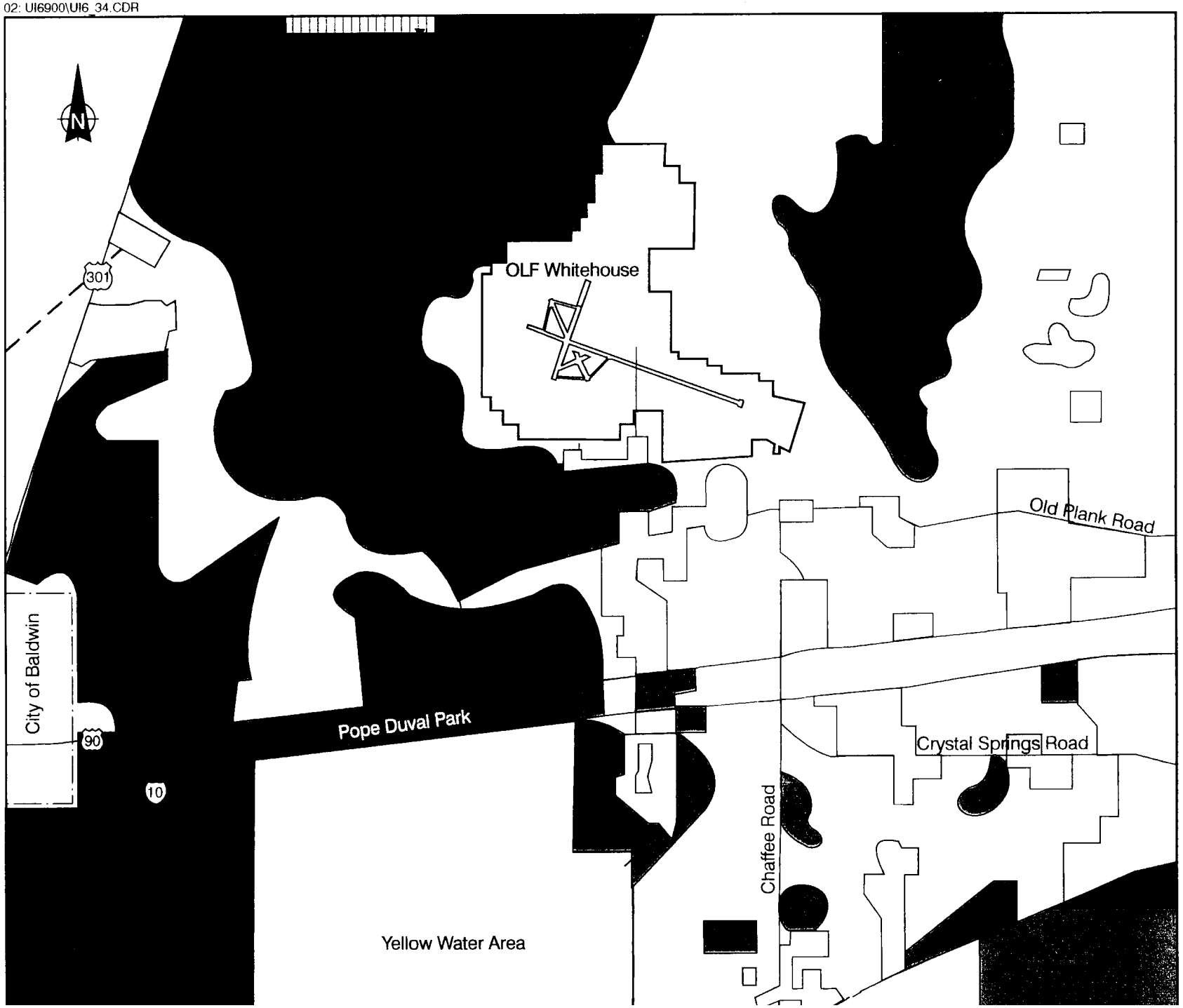
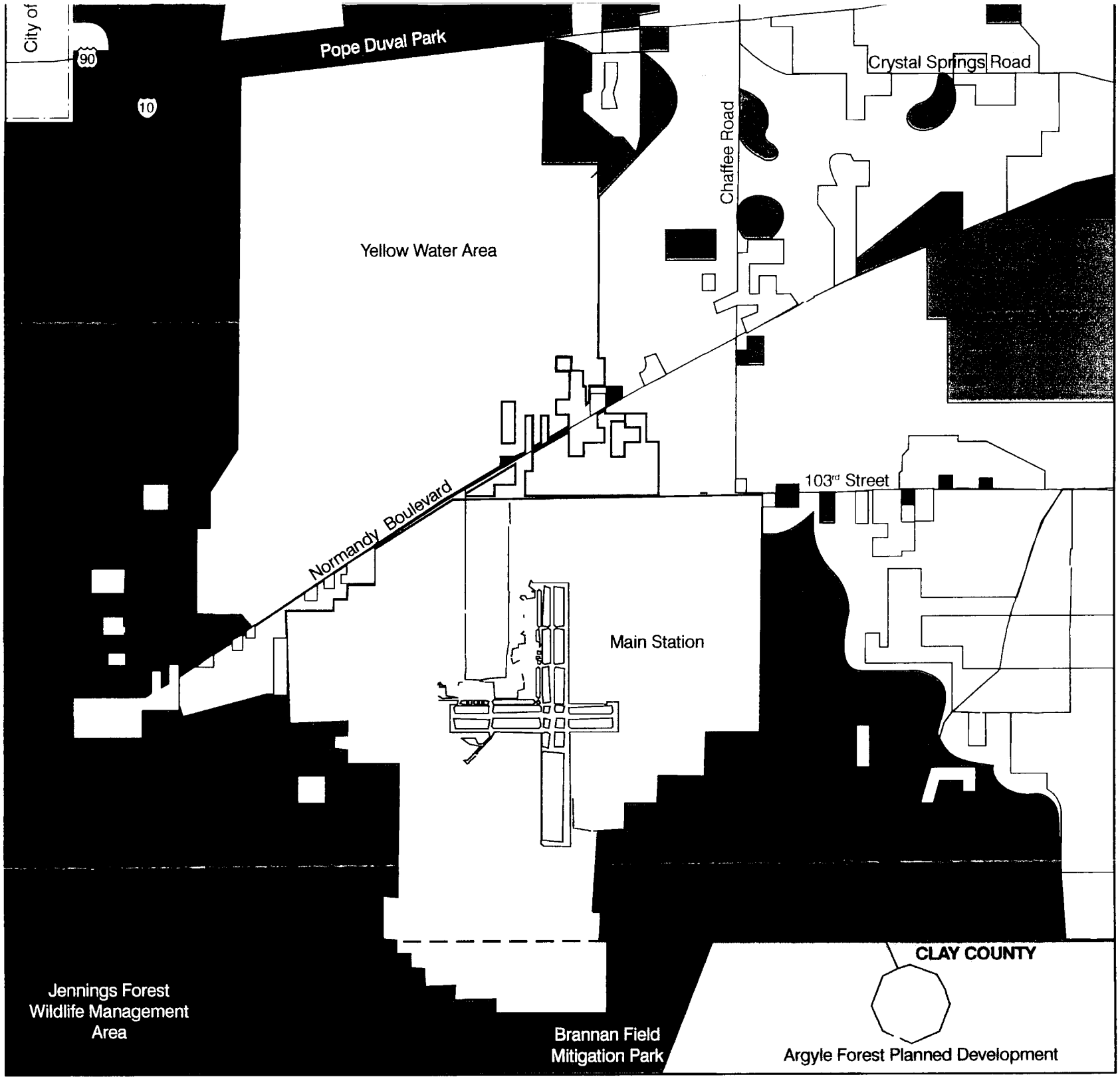
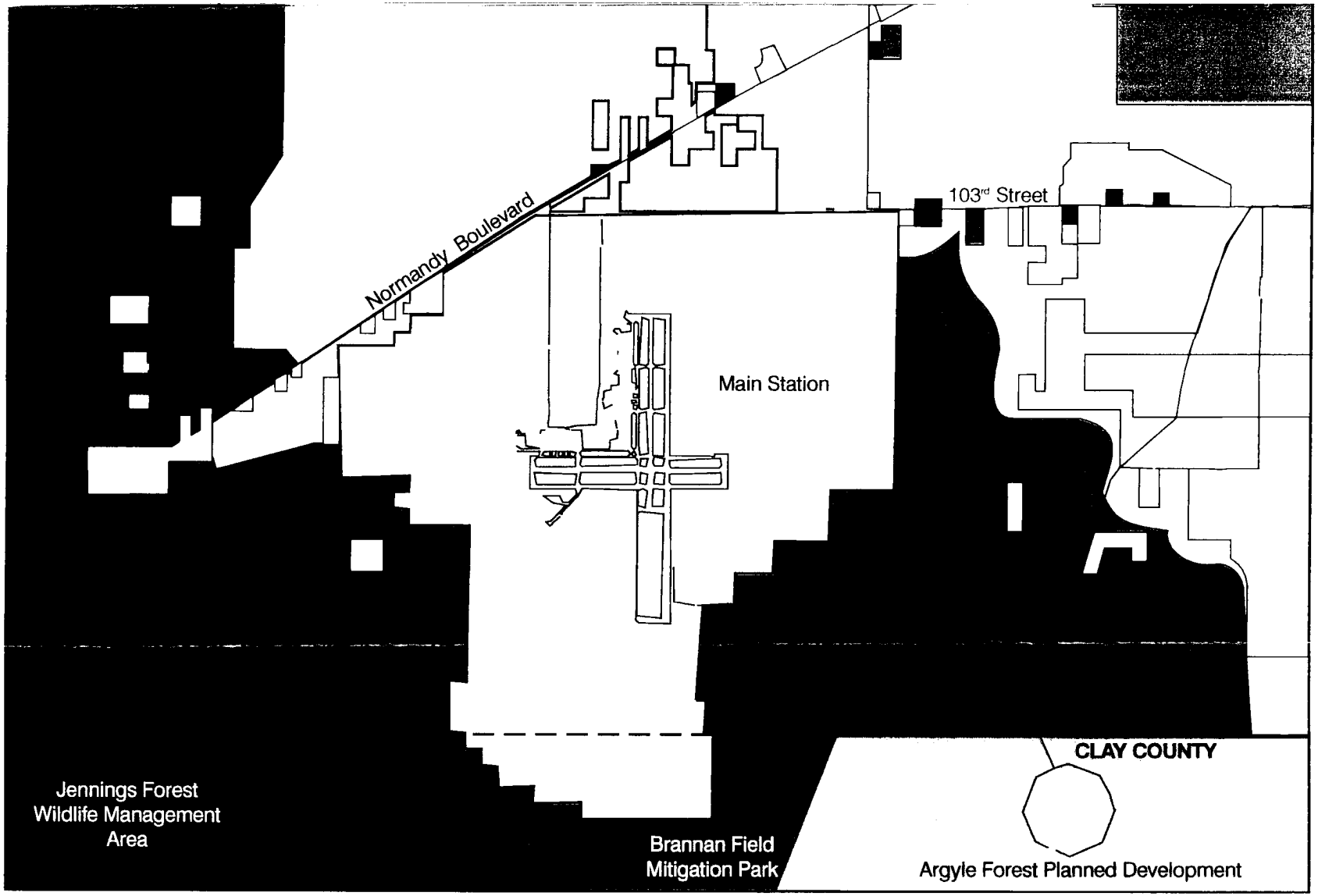



City of
90
10
Pope Duval Park
Crystal Springs Road
Chaffee Road
Yellow Water Area
103rd Street
Normandy Boulevard
Main Station
CLAY COUNTY
Jennings Forest
Wildlife Management
Area
Brannan Field
Mitigation Park
Argyle Forest Planned Development



SOURCE: Jacksonville Planning and Development Department 1990

KEY:

- Agriculture
- Low-Density Residential
- Navy Property
- Recreation
- Commercial
- Airport
- Planned Community (Not yet constructed)
- State Forest
- Open Space/Vacant
- Proposed Northeast Florida Regional Wildlife Mitigation Park

SCALE

0 3,500 7,000 14,000 Feet

Figure 3-3 SURROUNDING LAND USES

- The City of Baldwin, located 4 miles west of the Yellow Water Area along U.S. 90; and

- An undeveloped portion of Argyle Forest, a planned community being developed in Duval and Clay counties, located southeast of the Main Station (Ford 1994).

3.1.3 Land Use Plans and Land Development Regulations

Land use and development in the State of Florida is regulated by county and local municipalities. However, as a federal facility, NAS Cecil Field is not subject to the purview of local government regulations. Upon closure and disposal of the property by the Navy to another entity, future development on the station property will by guided and regulated by the City of Jacksonville/Duval County and Clay County pursuant to the requirements set forth by the following Florida State statues:

- Chapter 186, State and Regional Planning Act; and

- Chapter 163, the Local Government Comprehensive Planning and Land Development Regulation Act.

The State and Regional Planning Act, enacted in 1984 by the Florida Legislature, mandates the development of a State Comprehensive Plan to provide long-range guidance for orderly social, economic, and physical growth in the state. The act also mandated the development of 11 Comprehensive Regional Policy Plans (CRPPs) designed to further the goals and policies of the State Comprehensive Plan. For Duval and Clay counties, the Northeast Florida Comprehensive Regional Policy Plan is the CRPP. The CRPP links the State Comprehensive Plan and the local comprehensive plan (Northeast Florida Comprehensive Regional Planning Policy 1987).

The Local Government Comprehensive Planning and Land Development Regulation Act, passed by the Legislature in 1985, mandates the preparation of local comprehensive plans. The act requires that the local plan be developed to guide and control future development, and be consistent with both the State Comprehensive Plan and the CRPP.

Under the Chapter 163 statute, Jacksonville/Duval County and Clay County are required to adopt and implement three requirements that will influence future development at NAS Cecil Field. These are:

- Local Comprehensive Plans for Jacksonville/Duval County and Clay County;

- Land Development Regulations for Jacksonville/Duval County and Clay County; and

- Concurrency Management Systems.

3.1.3.1 Local Comprehensive Plans

The Jacksonville/Duval County 2010 Comprehensive Plan and the Clay County 2001 Comprehensive Plan are required under the Florida statutes to have, at a minimum, seven elements and a capital improvements plan. These elements are: future land use; traffic circulation; general infrastructure which includes sanitary sewer, solid waste, drainage, potable water, and natural groundwater aquifer recharge; conservation; housing; intergovernmental coordination; and recreation and open space (Jacksonville Planning and Development Department 1990; Clay County 1992). Each element of the plan has its own goals, objectives, and policies; all proposed development and redevelopment must be consistent with the policies of each applicable element. Comprehensive plans are required to be approved by the Florida Department of Community Affairs (DCA), and may be amended twice a year. The comprehensive plan is a policy document that is implemented by the local government's land development regulations.

The following summary identifies the intent of each of the 12 elements within the Jacksonville/Duval County and Clay County Comprehensive Plans. Although the comprehensive plans are organized in slightly different ways, each comprehensive plan addresses the following elements (Clay County 1992; Jacksonville Planning and Development Department 1990):

- **Future Land Use:** Designed to achieve an integrated, functional network of urban, suburban, and rural working environments by providing a framework to guide land development and redevelopment decisions throughout the planning period.

- **Intergovernmental Coordination**: To focus on the consolidated government's working relationships with other governmental entities. The purpose is to identify relationships that exist between local, regional, state, and federal agencies, and improve coordination to minimize duplicate and incompatible actions.

- **Recreation and Open Space Policies:** To call for growth of open space and recreation acreage; identify current deficiencies; and project future needs.

- **Traffic Circulation and Mass Transit:** To provide the framework for the safe and efficient movement of goods and persons (see Section 3.8).

- **Potable Water:** Designed to ensure protection of potable water resources through responsible growth and development (see Section 3.9.1).

- **Sanitary Sewer:** To ensure adequate provision of wastewater treatment and disposal and to systematically expand these services to avoid urban sprawl (see Section 3.9.2).

- **Housing:** To meet future housing needs, stabilize and improve existing neighborhoods, identify the social issues affecting housing, and identify those with special housing needs.

- **Drainage:** To provide the framework for managing stormwater systems by addressing water quantity and quality issues (see Sections 3.4 and 3.9.3).

- **Natural Groundwater Recharge:** To ensure adequate recharge of aquifer systems by identifying and protecting water basins (see Section 3.4.1).

- **Conservation and Coastal Management:** To identify specific goals in coastal areas for such issues as air quality, water quality, fisheries, wetlands, special management areas, and beach management.

- **Ports, Aviation, and Related Facilities:** To provide a framework for efficient and safe air, rail, and water transportation (see Section 3.8).

- **Capital Improvements:** To assess and demonstrate the financial feasibility of capital improvements required to implement various goals of the comprehensive plan (see Section 3.9.9).

The future land use (FLU) element is of primary concern in the development of future land use regulations. The FLU element indicates the desired patterns, densities, and intensities of development for the local community. Within Jacksonville, the station lies within the Southwest Comprehensive Planning District. On the Jacksonville/Duval County FLU map (see Figure 3-4), the station is designated as Public Facilities (Jacksonville Planning and Development Department 1990). The Clay County FLU map identifies the southern part of the Main Station as a military reservation (Clay County 1992).

Certain types and densities of land uses are recommended within each FLU category. The following is a general description of the land uses permitted within the FLU categories in Jacksonville and Clay County surrounding NAS Cecil Field:

- **Community/General Commercial Use:** Areas to the east of the station along Normandy Boulevard and 103rd Street are designated for community/general commercial uses. A wide range of retail

sales and services are permitted in this category, including general merchandise and food-related items. Uses should abut a roadway classified as an arterial or higher.

- **Low-Density Residential Use:** Areas to the east of the Main Station and Yellow Water are designated for low-density residential uses. A density of seven dwelling units per acre is permitted in this category if urban services are available; otherwise, a density of two dwelling units per acre is permitted when municipal water and sewer service are not available.

- **Rural Residential Use:** An area to the east of the Main Station is designated for rural residential uses. A density of one unit per acre is permitted in this area.

- **Business Park Use:** A small area to the east of the station along Normandy Boulevard is designated for business park use. Light assembly and manufacturing, processing, and research/development activities are permitted in this land use category.

- **Agriculture:** Agriculture and related uses include uses that do not attract spin-off urban development or activities that are not desirable in an urban area because of external impacts. The intensity and density of permitted development is minimal.

- **Recreational and Open Space Uses:** Areas directly north of the Yellow Water Area are designated for recreation and open space uses. These areas comprise Pope Duval Park. No new private development would be permitted in these areas.

- **Conservation (designated as Recreation/Preservation in Clay County FLU):** Areas to the southeast of the Main Station in Jacksonville and Clay County are designated for conservation. These areas represent publicly-owned land and land slated for public acquisition, containing valuable natural resources such as sensitive vegetation, high-value habitats,and wetlands.

3.1.3.2 Land Development Regulations

Local governments are required to adopt land development regulations (LDRs) within one year of the submission of their local comprehensive plan. LDRs are the implementation tools for the local comprehensive plan and must be consistent with the provisions of the comprehensive plan. LDRs consist of various types of regulations including zoning codes and subdivision regulations.

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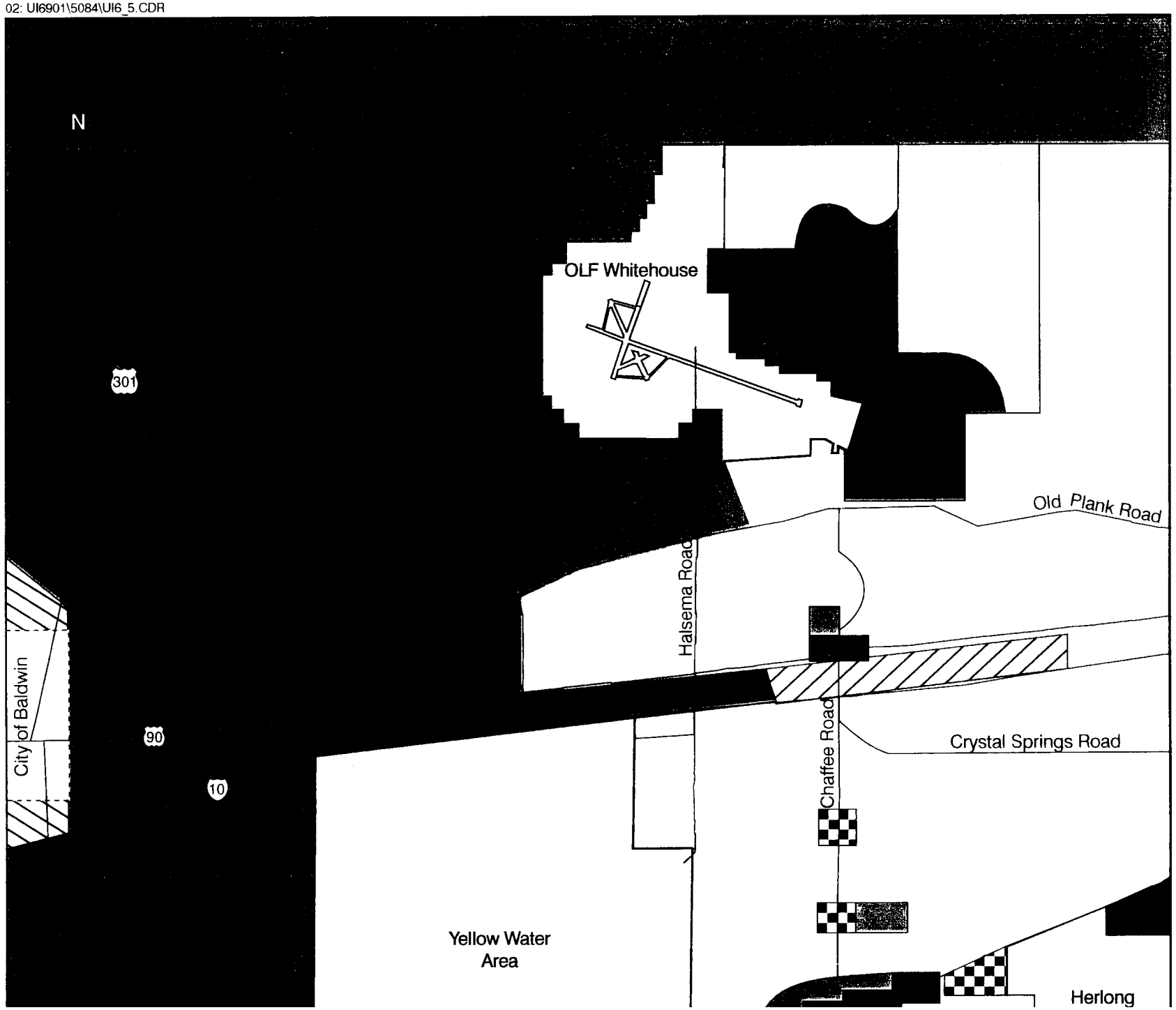
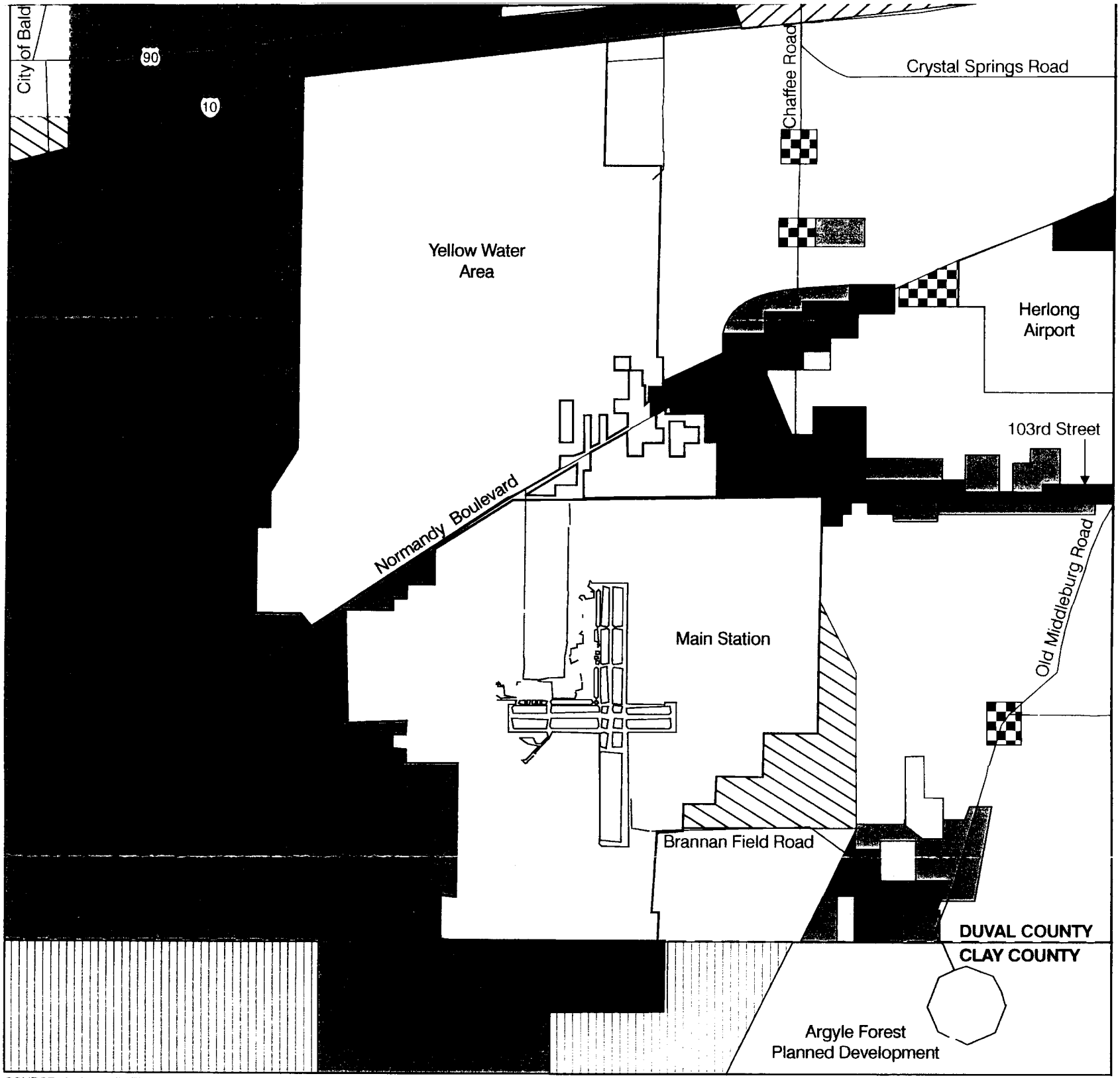
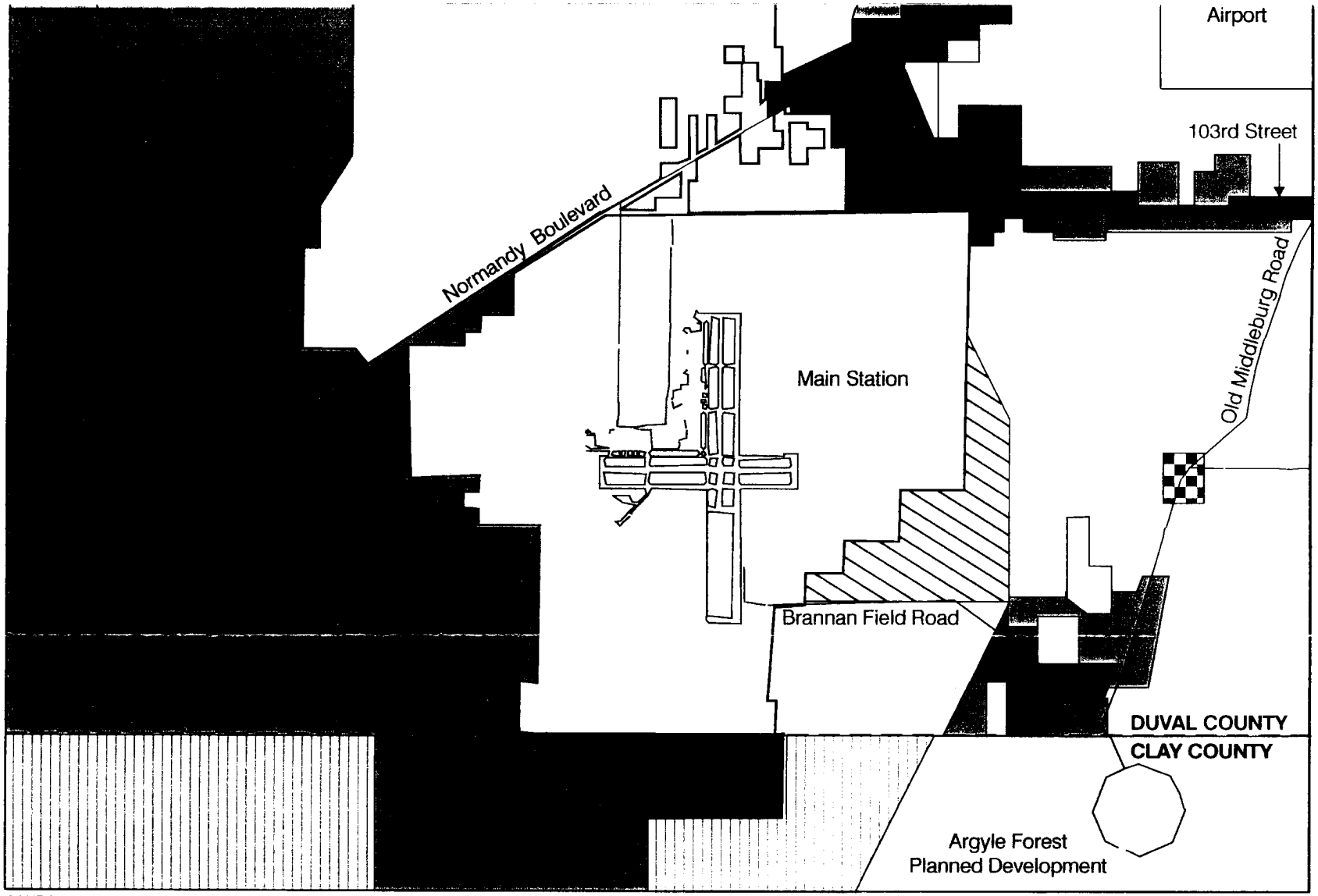



City of Bald
90
10
Chaffee Road
Crystal Springs Road
Yellow Water
Area
Herlong
Airport
103rd Street
Normandy Boulevard
Old Middleburg Road
Main Station
Brannan Field Road
DUVAL COUNTY
CLAY COUNTY
Argyle Forest
Planned Development



SOURCE: Jacksonville Planning and Development Department 1990

SCALE

0 3,500 7,000 14,000 Feet

KEY:

- Rural Residential
- Low-Density Residential
- Medium Density Residential
- Residential, Professional and Institutional
- Neighborhood Commercial
- Community/General Commercial
- Business Park
- Light Industrial
- Agriculture
- Conservation
- Recreation and Open Space
- Recreation/Preservation
- Planned Community
- Military Reservation
- Public Facilities

Figure 3-4 COMPREHENSIVE PLAN FUTURE LAND USE DESIGNATIONS

Zoning Code

The primary purposes of the zoning code are to promote the health, safety, and welfare of the general public; to regulate the use of land and buildings; and to implement the local comprehensive plan. Both the City of Jacksonville/Duval County and Clay County have a zoning map which outlines zoning districts in each jurisdiction. Duval County contains 36 separate zoning districts; Clay County contains 38 separate zoning districts. Each code describes the uses and densities permitted within each zoning district. Although federal facilities are typically exempt from local zoning, the portion of NAS Cecil Field within Jacksonville/Duval County is zoned PB-1, or Public Building Facilities, which permits major public uses or community service activities such as institutional, communication and utilities, and transportation services. The portion of NAS Cecil Field situated in Clay County is not zoned (Ford 1994). Each FLU category is implemented through a series of individual zoning districts responding to the specific land use characteristics in the immediate area of the zoning district. Each zoning district within a specific FLU category (e.g., rural residential) is required to be consistent with the purpose and intent of that category.

Both Jacksonville/Duval County (Part 10, Chapter 656) and Clay County (Ordinance 85-87) have an Air Installation Compatible Use Zone (AICUZ) ordinance. The purpose of the AICUZ ordinance is to provide a guide to compatible land development on- and off-station in order to minimize public exposure to aircraft noise and accidents, and at the same time protect the operational capability of the station. The AICUZ program defines multiple noise and accident-compatible use zones, and the range of acceptable land uses within the zones. The goal of the AICUZ program is to achieve compatible land use in the air installation environs (NAS Cecil Field n.d.). A discussion of the noise levels associated with the station's AICUZ is provided in Section 3.6 of this DEIS.

Subdivision Regulations

The primary purpose of subdivision regulations is to regulate the subdivision of land and provide for adequate provision of light, air, recreation, transportation, potable water, flood prevention, drainage, sewers, other sanitary facilities, environmental protection, and government services for each new parcel. Land subdivision is the first step in the development of a community, and in nearly all cases, subdivision approval by the local government is required for the legal transfer of a newly subdivided parcel. The subdivision regulations are intended to be consistent with the applicable goals, objectives, and policies set forth in the local comprehensive plan.

3.1.3.3 Concurrency Management System

The Concurrency Management System (CMS) in Jacksonville/Duval County and Clay County was developed pursuant to the concurrency requirements set forth in FS Chapter 163 (Part II), Section 163.3177(10)(h), which require that public facilities and services needed to support development be available concurrent with the impacts of such development. The purpose of the CMS is to measure the potential impact of a proposed development on the adopted levels of service established in the comprehensive plan. The CMS ensures that the adopted levels of service will not be degraded by the issuance of a final development order. The components of the CMS in Jacksonville/Duval County are addressed under Chapter 655, Municipal Code, which requires concurrency for roadway and mass transit, drainage, water and sewer, recreation, and solid waste facilities. Clay County addressees the concurrency management requirement under Ordinance 92-19, as amended, and requires concurrency for traffic, sanitary sewer, potable water, and stormwater management.

3.1.4 Aesthetic Resources

The aesthetic environment at NAS Cecil Field varies significantly between undeveloped areas, personnel support areas, and military operations areas. The overall aesthetic image of NAS Cecil Field is positive, although some elements exist to detract from this positive image.

The dominance of tall pine trees in the undeveloped areas and scattered in the developed areas provides a unifying feature throughout the station. Tall pine trees dominate the undeveloped portions of "A" Avenue and "D" Avenue leading away from the main entrances. A pedestrian walkway is located along "D" Avenue and is adequately separated from the road. Traffic circulation is positive due to the gridiron network of roadways, and access to most of the developed areas of the station is relatively easy. The design of existing parking areas, however, tends to detract from a positive aesthetic experience as a result of poor entrance visibility, insufficient buffering to the roadways, and encroachments onto the streets (Navy 1988).

Vistas are limited throughout the station due to low-density, tall pines, and flat topography. Views primarily occur along major roads and in the air operations area.

Existing utility facilities tend to affect the view of aesthetic resources on the station. Aboveground utility lines and steam lines combined with utility boxes, heating and air conditioning units, and garbage dumpsters are evident in the developed areas of the station. Many of these items are surrounded with chain-link fences which provide no visual buffer.

The aesthetic environment of the family housing areas varies between officer and enlisted areas. Senior officer housing consists of large-lot, single-family, detached, wooden houses among the tall pine trees along "G" Avenue and "H" Avenue. Enlisted family housing along "D" Avenue is characterized by one-story, concrete-block, attached dwellings situated both perpendicular and horizontal to the street. The sidewalks in the enlisted housing area are small and appear to also function as drainage pathways. Additional family housing in the form of a mobile home park is located south of the family housing area. The family housing areas are buffered from "D" Avenue by tall pine trees.

The architectural design of structures at NAS Cecil Field is basically utilitarian. Buildings range from those constructed during World War II to modern three-story buildings. Most buildings on the Main Station were built during the 1950s and many have flat roofs (Navy 1988).

The air operations area is an open area characterized by aircraft hangars, operations buildings, parking areas, and miscellaneous industrial, warehouse and training buildings. Aircraft are visible along the runway apron. The edge of the air operations area along "A" Avenue is characterized by steam lines and a collection of structures of different types and sizes.

Recreational areas such as Lake Fretwell, Lake Newman, and the golf course are generally well-designed, surrounded by tall pines, and provide a feeling of remoteness. Because these areas are removed from the developed part of the Main Station, the facilities are not visible from the built-up area.

The aesthetic resources of the Yellow Water Area are characterized as low-lying, flat, natural environments dominated by large expanses of tall pines with small pockets of minor development.

3.2 Topography, Geology, and Soils

NAS Cecil Field lies within a physiographic feature called the Duval uplands, which is an irregular flat plain composed mostly of the Wicomico marine terrace (Scott *et al.* 1988). The Wicomico marine terrace ranges in elevation from 70 to 100 feet above mean sea level (MSL). The southern portion of the facility is located on remnants of the Penholoway marine terrace (42 to 70 feet above MSL) (Scott 1988). Land surfaces at NAS Cecil Field are nearly level, with very slight slopes leading to creeks and wetland areas.

Soils in Duval and Clay counties have been divided into four groups: soil of the sand ridges, soil of the flatwoods, soil of the hardwood and cypress swamps, and soil of the tidal

marsh. Soil types at NAS Cecil Field generally consist of soil of the flatwoods (USDA 1978; 1989).

Flatwoods soil is comprised of the Leon-Oretga, Leon-Ridgeland-Wesconnett, and Pelham-Mascotte-Sapelo map units. Only the Leon-Ridgeland-Wesconnett series and the Pelham-Mascotte-Sapelo series are present at NAS Cecil Field.

Leon-Ridgeland-Wesconnett soils are nearly level and poorly-to-very-poorly drained fine sands and are well suited for use as pine woodland/silvicultural activity, but are moderately to poorly suited for community development because of wetness. Pelham-Mascotte-Sapelo soils are also nearly level fine sands with drainage characteristics similar to the Leon-Ridgeland-Wesconnett soils. Pelham-Mascotte-Sapelo soils contain fine sandy loams and sandy clay loams at depths of 15 inches below ground surface (BGS) and more.

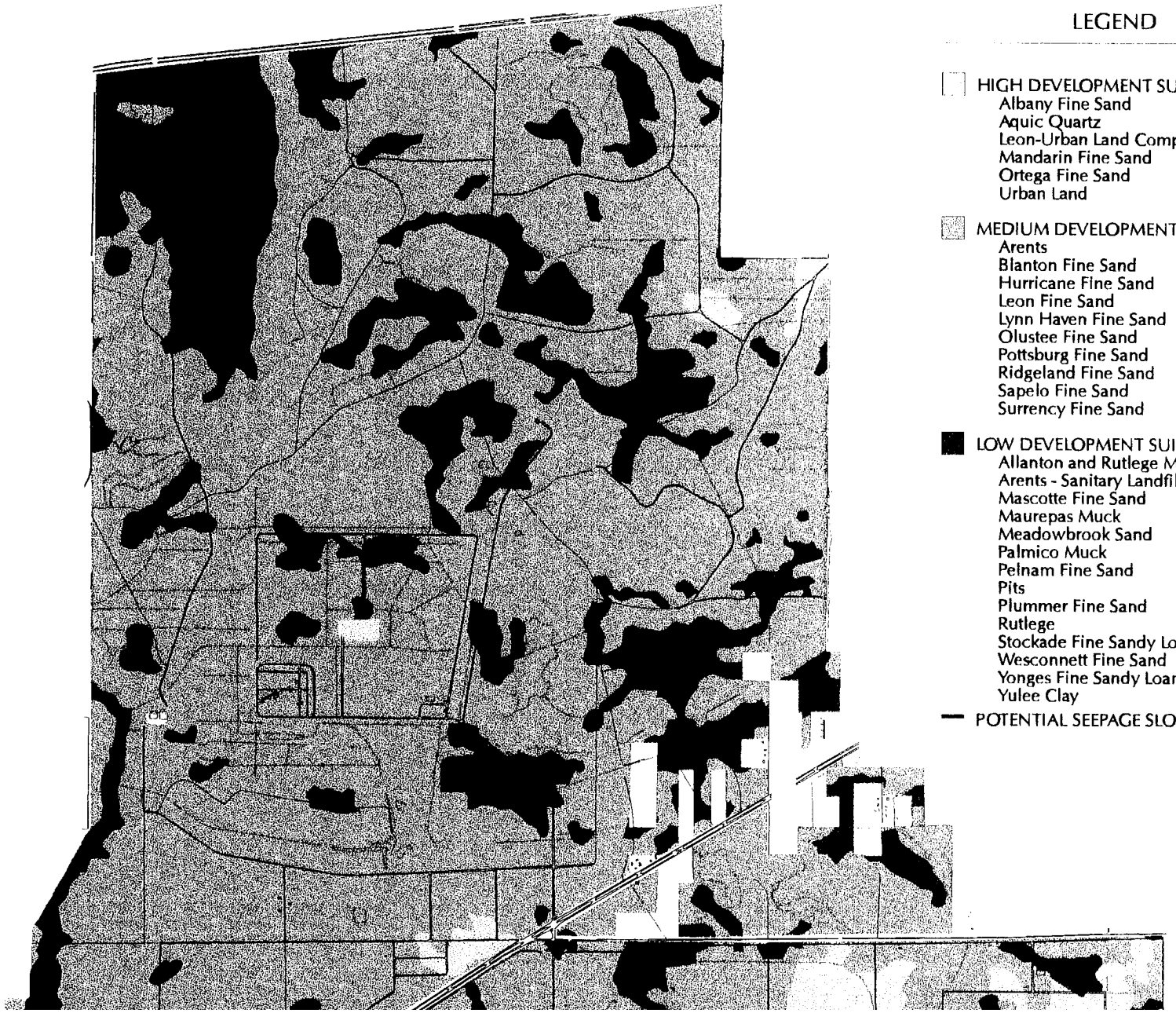
In addition, portions of the station along the Sal Taylor Creek, the Caldwell Branch, and Yellow Water Creek have been designated as potential seepage slopes by the City of Jacksonville (Moore 1996).

Thirty individual soil units are present at NAS Cecil Field (USDA 1978; 1989). Figure 3-5 depicts these various units, grouped by their development suitability. Soils classified as having high development suitability are sandy moderately well-drained soils with little organic matter that are not subject to flooding. Soils classified as having medium development suitability are somewhat poorly to moderately drained soils that, with proper stormwater management, could be relatively easy to develop. Soils with low development suitability are those which are poorly drained, contain high amounts of organic matter, and are subject to long periods of flooding. These soils are often located in drainageways and are indicative of wetlands, floodplains, and seepage slopes (USDA 1978; 1989).

3.3 Terrestrial Resources

3.3.1 Vegetation

Vegetation in the Main Station and the Yellow Water Area is managed under the Navy's Long Range Forest Resource Management Plan, which was implemented in 1963. Forest cover types are divided into stands (i.e., contiguous groups of trees of similar age). Stands are managed using an even-aged management system whereby the dominant trees originate at about the same time, and therefore, are typically harvested at the same time by clear cutting. An initial thinning is conducted approximately 18 to 20 years after clear cutting, followed by additional thinning every seven to 10 years until final harvest. The final



LEGEND

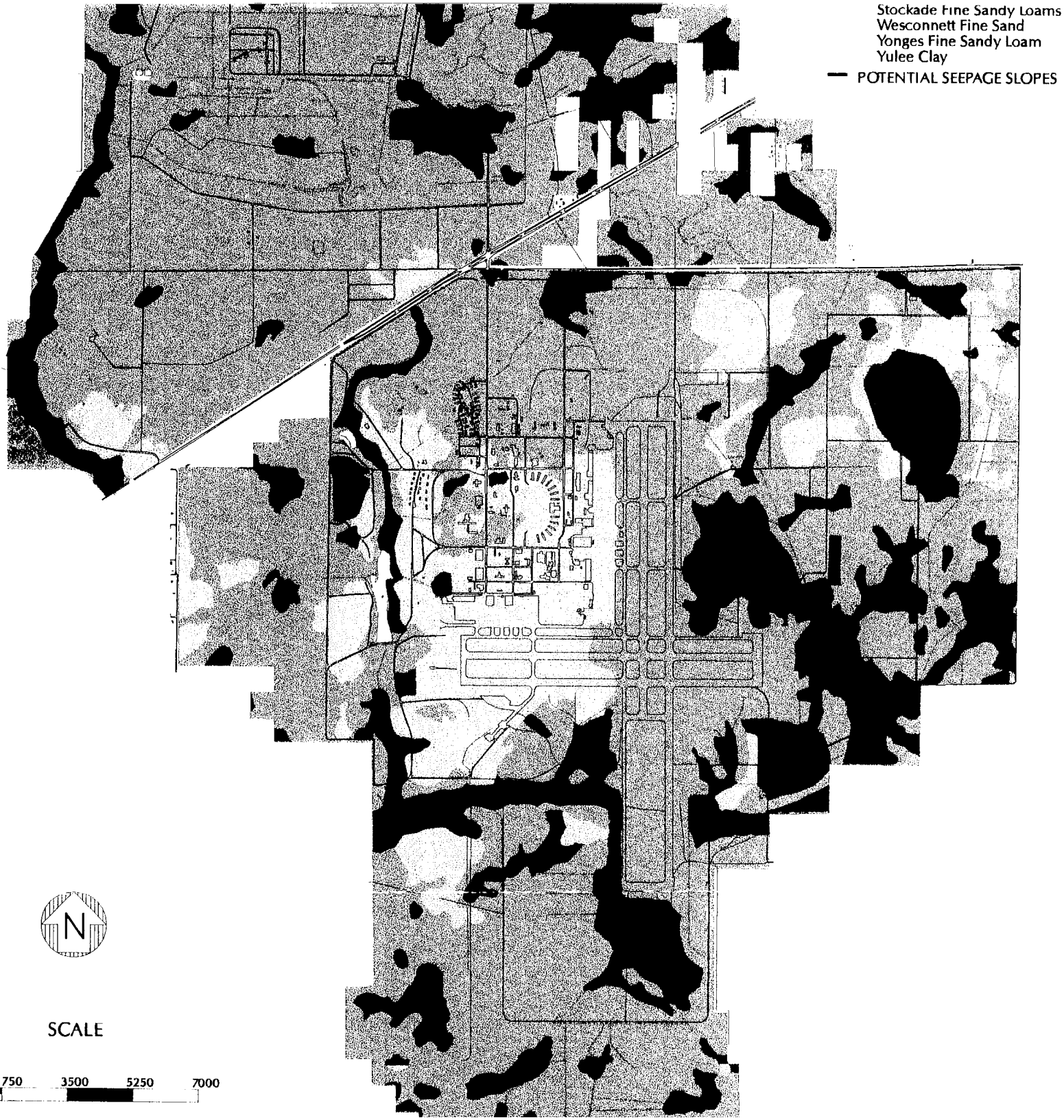
HIGH DEVELOPMENT SUITABILITY
- Albany Fine Sand
- Aquic Quartz
- Leon-Urban Land Complex
- Mandarin Fine Sand
- Ortega Fine Sand
- Urban Land

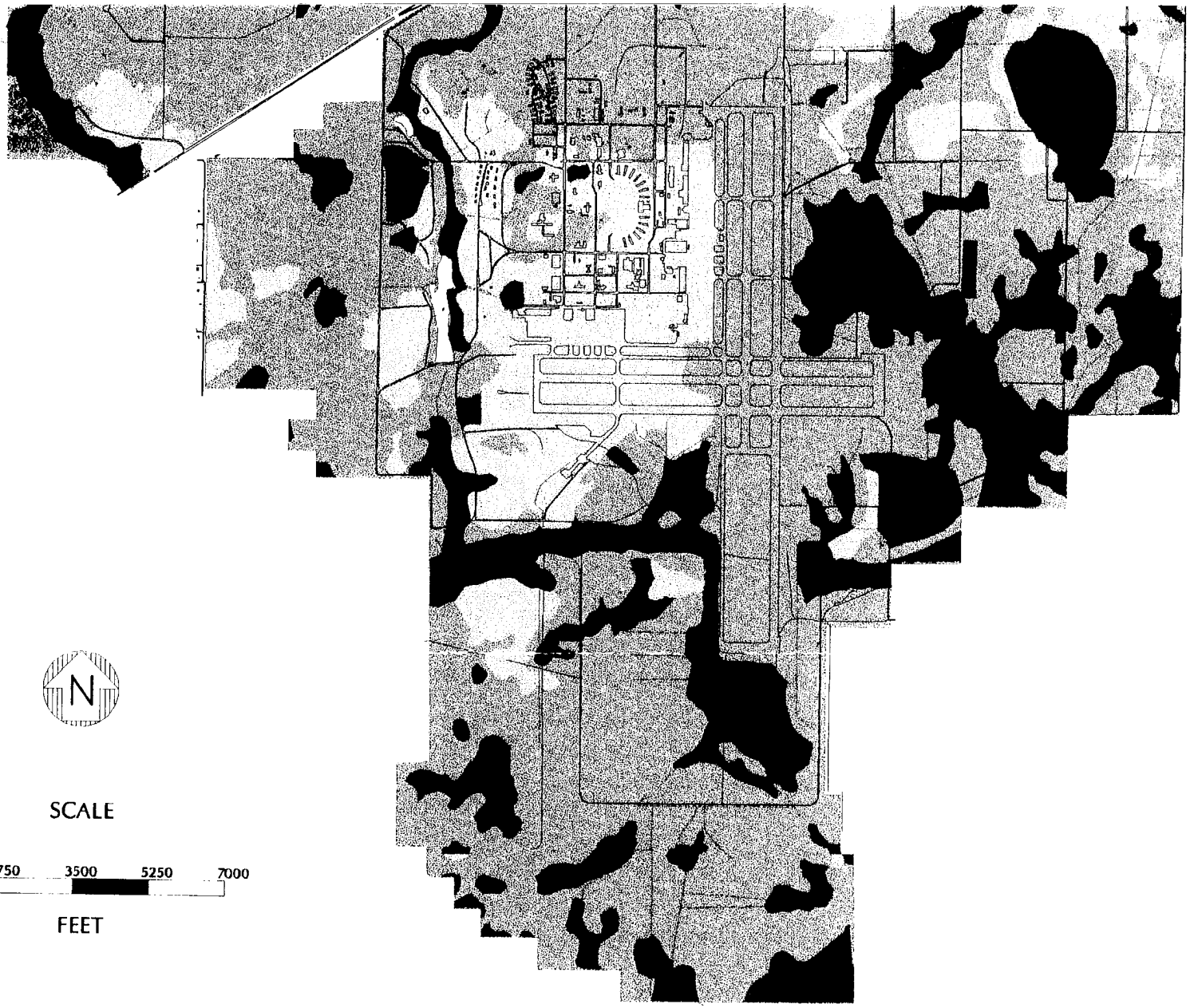
MEDIUM DEVELOPMENT SUITABILITY
- Arents
- Blanton Fine Sand
- Hurricane Fine Sand
- Leon Fine Sand
- Lynn Haven Fine Sand
- Olustee Fine Sand
- Pottsburg Fine Sand
- Ridgeland Fine Sand
- Sapelo Fine Sand
- Surrency Fine Sand

LOW DEVELOPMENT SUITABILITY
- Allanton and Rutlege Mucky
- Arents - Sanitary Landfill
- Mascotte Fine Sand
- Maurepas Muck
- Meadowbrook Sand
- Palmico Muck
- Pelnam Fine Sand
- Pits
- Plummer Fine Sand
- Rutlege
- Stockade Fine Sandy Loams
- Wesconnett Fine Sand
- Yonges Fine Sandy Loam
- Yulee Clay

POTENTIAL SEEPAGE SLOPES

(e)


Stockade Fine Sandy Loams
Wesconnett Fine Sand
Yonges Fine Sandy Loam
Yulee Clay
POTENTIAL SEEPAGE SLOPES
N
SCALE
0
1750
3500
5250
7000



Source: USDA 1978 ; 1989

Figure 3-5 SOILS MAP - MAIN STATION / YELLOW WATER AREA

harvest usually occurs after 55 to 65 years for pine-dominated stands, and after 75 to 85 years for hardwood-dominated stands. Over 99% of the forested acreage at the facility was harvested less than 60 years ago, and approximately 92% was harvested less than 50 years ago (Navy 1992). Approximate acreages and descriptions of upland and wetland cover types are based on the Forestry Management Section of the Natural Resources Management Plan for Cecil Field, the Cecil Field Gopher Tortoise Survey and Management Plan (CZR, Inc. 1994), and National Wetland Inventory maps (Navy 1994c).

3.3.1.1 Upland Vegetation

The upland vegetation of NAS Cecil Field can be categorized into six cover types: pine and mixed hardwood forest, pine flatwoods, longleaf pine-turkey oak, shrub and brushland, transitional hardwoods, and disturbed/developed areas. The dominant cover type is pine and mixed hardwood, which accounts for approximately 33% of the station property. The other five upland cover types comprise a total of 42% of the station property, and the remainder of the area is wetland. Distribution of the upland cover types is presented in Figure 3-6.

Pine and Mixed Hardwood Forest

Upland forests dominated by slash pine (*Pinus elliottii*), loblolly pine (*P. taeda*), longleaf pine (*P. palustris*), and pond pines (*P. serotina*) occupy approximately 5,813 acres of the station. Slash pine has been planted in many areas along the coastal plain that formerly were longleaf pine flatwoods. Military activity in the 1940s resulted in the removal of much of the existing vegetation and subsequent replanting with slash pine (Navy 1992).

The pine forests are usually managed intensively through periodic thinning, improvement cutting, salvage cutting, and prescribed periodic burns to diminish the density of the shrub layer, which presumably competes with the more desirable overstory for water and nutrients. Whereas hardwood forests generally are not replanted, pine forests are usually replaced by natural or artificial reseeding or by planting seedlings. Presently, approximately 12% (2,000 acres) of the forested area at NAS Cecil Field is less than 20 years old (Navy 1992).

Although the overstory of pine forest consists principally of the aforementioned pine species, bald cypress (*Taxodium distichum*), and broad-leaved species including sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), red maple (*Acer rubrum*), redbay (*Persea borbonia*), loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), and

occasionally southern red cedar (*Juniperus silicicola*) can constitute significant portions of the overstory and subcanopy. The shrub layer typically consists of wax myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), titi (*Cliftonia monophylla*), staggerbush (*Lyonia* spp.), and saw palmetto (*Seranoa repens*). Ground cover species include St. John's-wort (*Hypericum* spp.), spikerush (*Eleocharis* spp.), yellow-eyed grass (*Xyris* spp.), bog buttons (*Lachnocaulon* spp.), and bracken fern (*Pteridium aquilinum*). Vines including muscadine grape (*Vitis rotundifolia*), Virginia creeper (*Parthenocissus cinquefolia*), and green brier (*Smilax* spp.) are locally abundant.

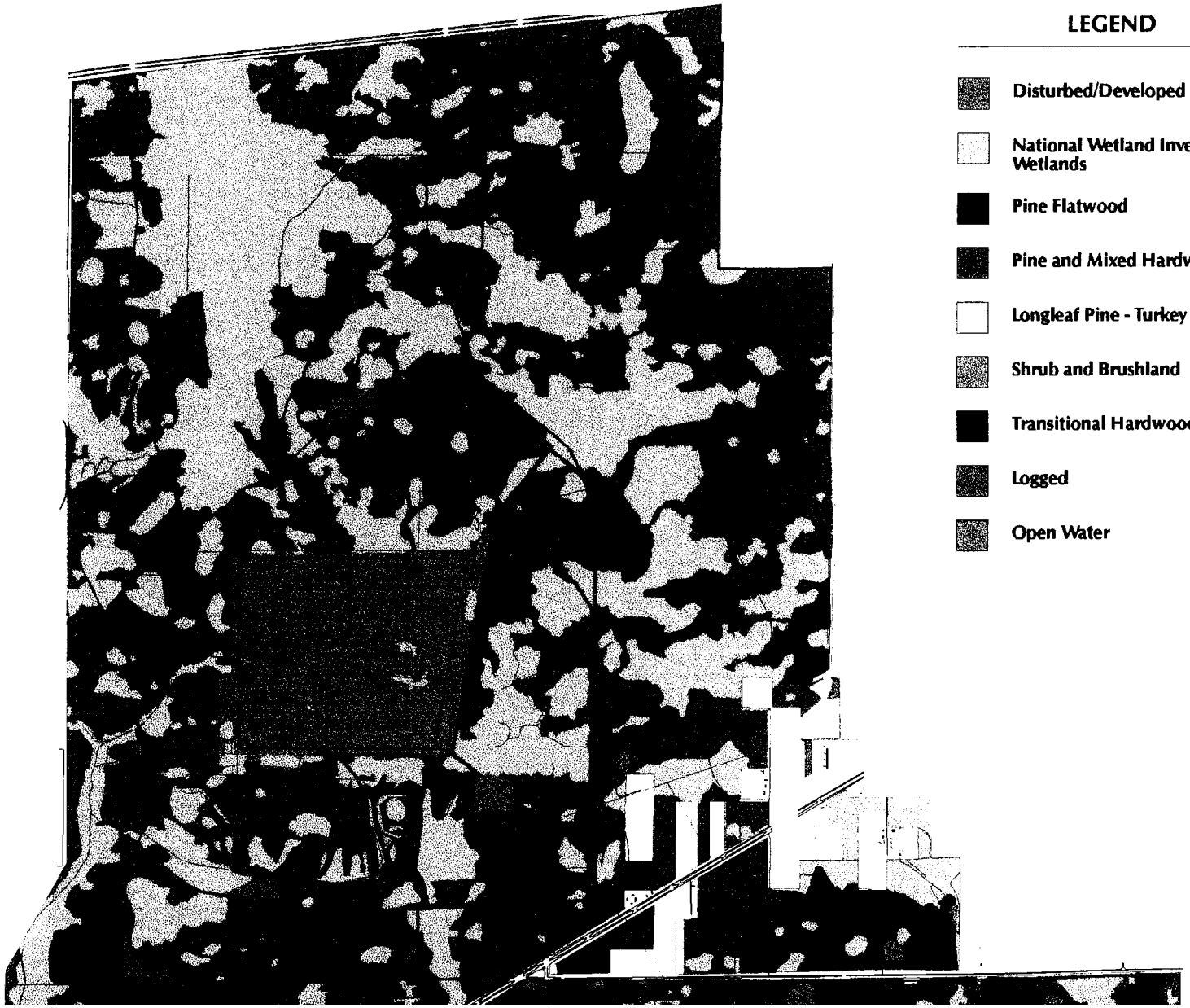
On drier sites, such as those dominated by longleaf pine, typical components of the subcanopy and shrub layers include turkey oak (*Quercus laevis*), blue jack oak (*Quercus incana*), persimmon (*Diospyros virginiana*), and black cherry (*Prunus serotina*). Ground cover consists of gopher apple (*Licania michauxii*), tarflower (*Befaria racemosa*), beargrass (*Yucca filamentosa*), bracken fern, blueberry (*Vaccinium* spp.), broomsedge (*Andropogon* spp.), and wiregrass (*Aristida* spp.).

Pine Flatwoods

The Pine Flatwood community occurs on relatively level terrain and occupies approximately 3,591 acres of the station. Large portions of this community have a water table near the surface for prolonged periods, and the soils are typically acidic and moderately to poorly drained (CZR, Inc. 1994). The majority of this habitat type consists of planted pine. The dominant canopy species is slash pine with canopy coverage ranging from 60 to 80 percent. Saw palmetto dominates the shrub layer in the drier areas of this cover type, while gallberry (*Ilex glabra*) is usually scattered throughout the wetter flatwood areas. The amount of groundcover present is highly variable, often depending on the relative density of the canopy and shrub layer. Frequently occurring groundcover species include wiregrass, low bush blueberry (*Vaccinium myrsinites*), and blackberry (*Rubus* spp.). Other common species in this community include live oak (*Quercus virginiana*), bracken fern, laurel greenbriar (*Smilax laurifolia*), and Carolina jessamine (*Gelsemium sempervirens*) (CZR, Inc. 1994).

Longleaf Pine-Turkey Oak

Longleaf pine-turkey oak plant communities usually occur on relatively infertile, well-drained soils and account for approximately 322 acres of vegetation at the station. Two variations of this community occur, although both are dominated by longleaf pine and turkey oak. The first variation is composed primarily of mature longleaf pine with a scattered



LEGEND

- Disturbed/Developed Areas
- National Wetland Inventory (NWI) Wetlands
- Pine Flatwood
- Pine and Mixed Hardwood Forest
- Longleaf Pine - Turkey Oak
- Shrub and Brushland
- Transitional Hardwoods
- Logged
- Open Water


N
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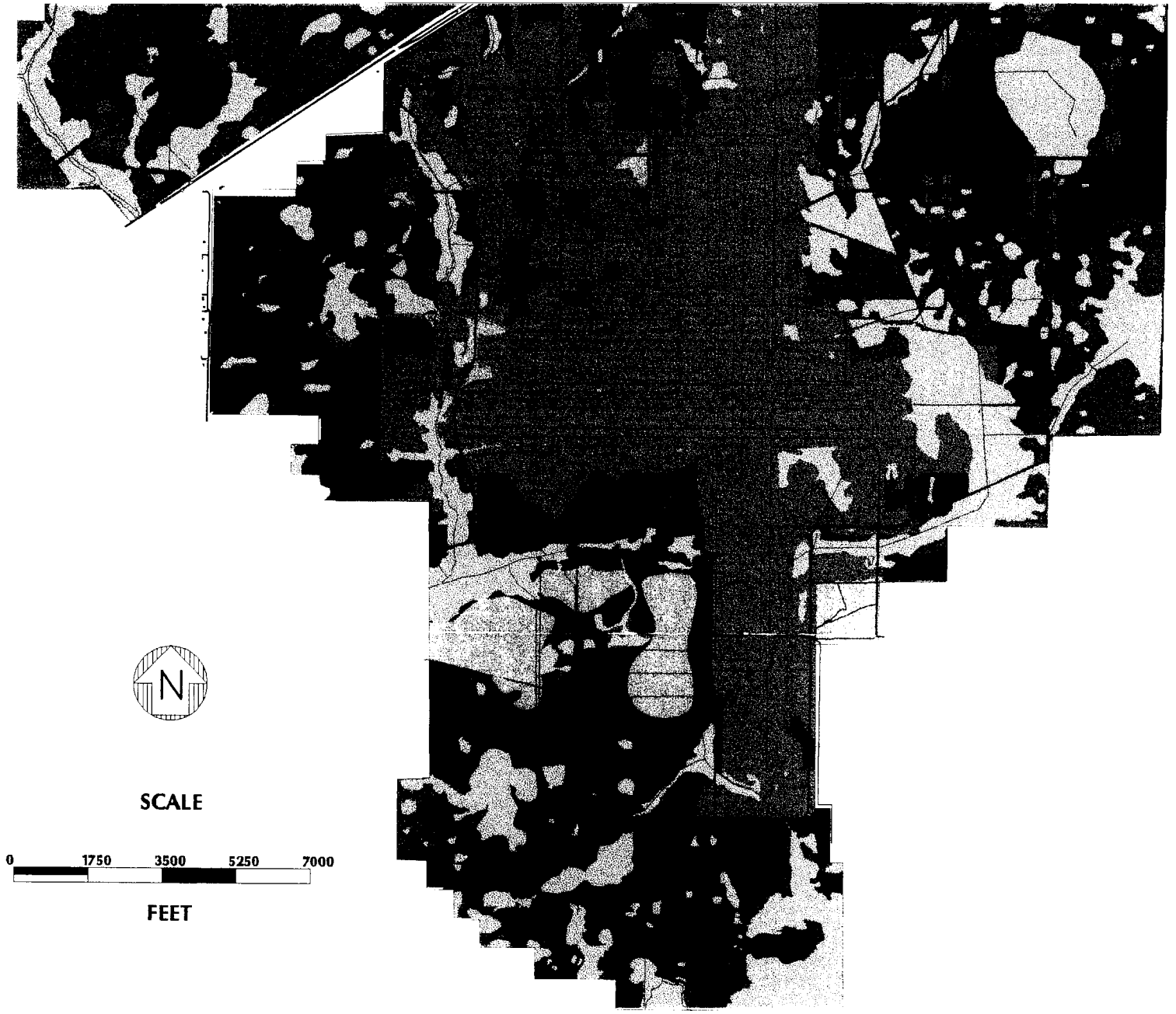


Source: CZR 1994

(3) FIGURE 3-6 VEGETATION - MAIN STATION / YELLOW WATER AREA

subcanopy of turkey oak and runner oak (*Quercus* spp.). The second type includes areas in which the longleaf pine trees have been cleared for timber, and the areas are dominated by turkey oaks. The groundcover in both types is scattered and diverse with numerous areas of exposed soil. Common herbaceous species include wiregrass, milkweed (*Asclepias humistrata*), butterfly pea (*Centrosoma virninianum*), British soldier (*Cladonia* spp.), and low panicum (*Panicum* spp.) (CZR, Inc. 1994).

Shrub and Brushland

Shrub and brushland areas are dominated by several woody shrub species, as well as herbaceous plants and grasses. These areas comprise approximately 382 acres of land throughout the station. The shrub areas of this community typically include slash pine saplings, saw palmetto, wax myrtle, and gallberry. The brushland or herbaceous areas consist of wiregrass, muscadine grape, and rusty lyonia (*Lyonia ferruginea*) (CZR, Inc. 1994).

Transitional Hardwoods

The Transitional Hardwood community includes a small area of approximately 8 acres in the Main Station, and is composed primarily of upland hardwood species with scattered pine species. Commonly occurring species include live oak, loblolly pine, sweetgum, and loblolly bay. Other plant species commonly found in this community type include beautyberry (*Callicarpa americana*), laurel greenbriar, redbay, and water oak (CZR, Inc. 1994).

Disturbed/Developed Areas

Disturbed/developed areas occur on approximately 3,058 acres of the station. These areas include the land immediately surrounding buildings, airstrips, recreational facilities, roads, and any other areas that are regularly managed (mowed) by base personnel. Vegetation within these areas primarily consists of herbaceous plants and/or ornamental trees and shrubs. Dominant herbaceous plants include planted grasses such as Bermuda (*Cynodon dactylon*), and bahia (*Paspalum notatum*), and other herbs such as capeweed (*Lippia nodiflora*), cudweed (*Gnaphalium* spp.), and clovers (*Trifolium* spp.). Commonly planted ornamental trees or shrubs include dwarf holly (*Ilex vomitora*), Chinese holly (*Ilex burfordi*), Harland boxwood (*Buxus harlandi*), Japanese yew (*Podocarpus macrophylla*), crab apple (*Malus hybrida*), and flowering dogwood (*Cornus florida*) (CZR, Inc. 1994).

3.3.1.2 Wetland Vegetation

Wetland areas on NAS Cecil Field were identified using the United States Fish and Wildlife Service's (USFWS) existing National Wetland Inventory (NWI) maps of the area (see Figure 3-7). These wetlands were grouped and characterized according to the Cowardin System of wetland classification (Cowardin *et al.* 1979). Wetlands identified on NWI maps are usually based on aerial photograph interpretation. Therefore, a formal wetland delineation survey may reveal additional wetland areas or varying extents of mapped wetlands.

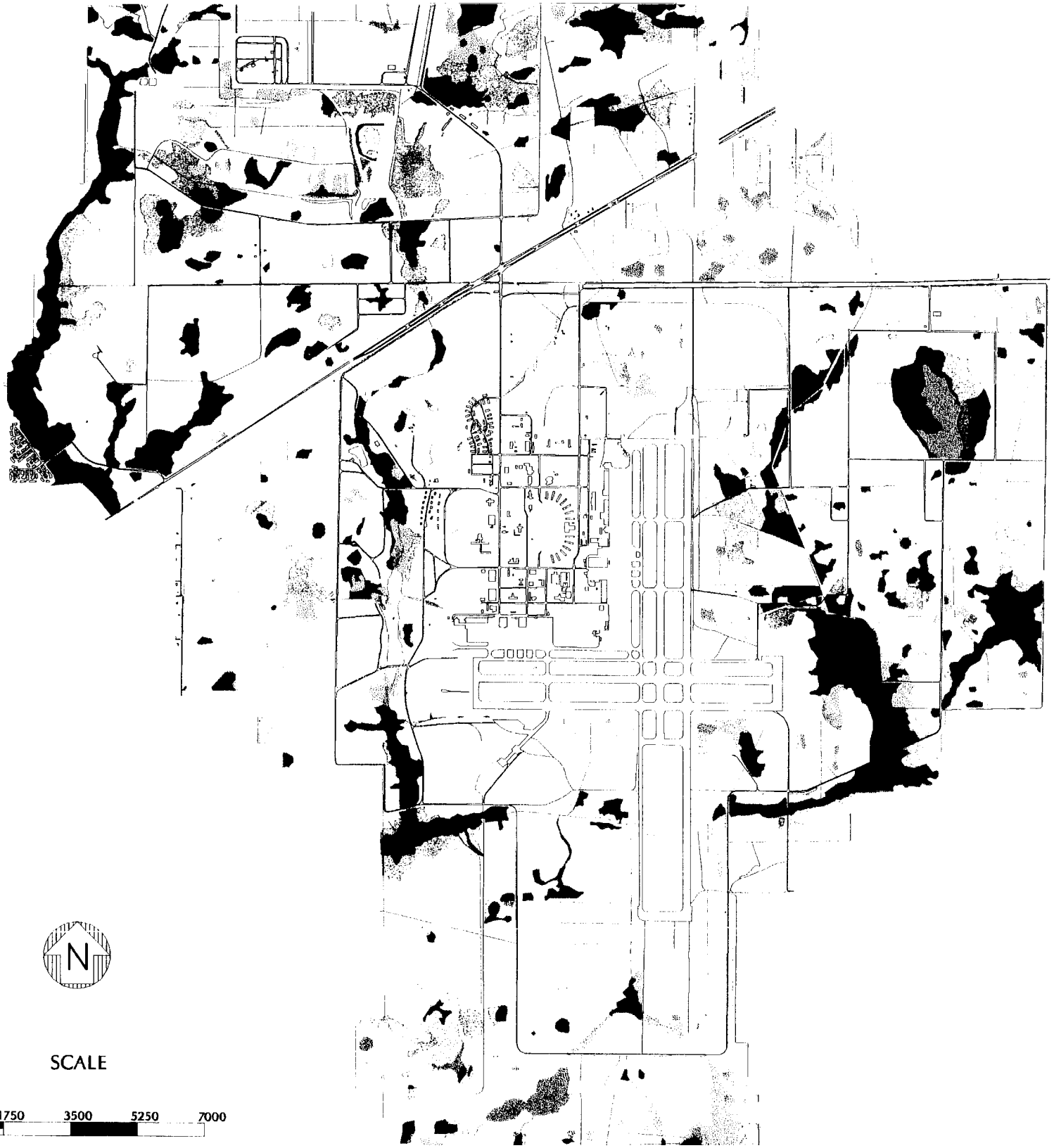
At the Main Station and Yellow Water Area, wetland plant communities account for approximately 25% (4,427 acres) of the total land area. The majority of the wetlands on these facilities have been disturbed by logging practices or the construction of military facilities. Individual wetland types are discussed in the following paragraphs.

Palustrine Forested (PFO)

Approximately 3,696 acres of palustrine forested wetland occur along the streams (Rowell Creek, Sal Taylor Creek, and Yellow Water Creek) located at the station (Navy 1991). Forested wetlands at the station include hardwood wetlands, broad-leaved deciduous (PFO1); cypress swamps, needle-leaved deciduous (PFO2); bay swamps, broad-leaved evergreen (PFO3); and pine wetlands, needle-leaved evergreen (PFO4). Hardwood wetland is the most prevalent wetland type at the facility and occupies 2,438 acres.

Hardwood wetlands (PFO1) are dominated by deciduous hardwoods bordering creeks and areas where the forest floor is saturated or submerged during part of the year, and they are present in low-lying areas where floodwaters collect at the Main Station and Yellow Water Area. The most extensive hardwood wetland is located in the northwest corner of the Yellow Water Area. Most of the hardwood wetland areas are subject to intermittent flooding (floodwaters as high as 4 to 5 feet were observed during a 1994 field survey conducted by ABB Environmental Services, Inc. [ABB-ES 1994]). Rowell Creek, Sal Taylor Creek, Yellow Water Creek, and some of its lesser tributaries to the east are typified by this classification at the Main Station and Yellow Water Area. Red maple (*Acer rubrum*), water oak (*Quercus nigra*), swamp bay (*Persea palustris*), tupelo (*Nyssa sylvatica var. biflora*), and sweet gum (*Liquidambar styraciflua*) are common along these drainage pathways. Many forested areas, such as the area draining to the east into Rowell Creek, contain hardwood forests with a variable understory of herbs and ferns. Occasional bayheads, scattered in the pine flatwoods, harbored many of these same species as well as an occasional bald cypress (Envirodyne Engineers 1985). The soils commonly associated with this community are nearly


LEGEND
Palustrine Forested (PF01)
Palustrine Forested (PF02)
Palustrine Forested (PF03)
Palustrine Forested (PF04)
Palustrine Scrub/Shrub (PSS1)
Palustrine Scrub/Shrub (PSS3)
Palustrine Scrub/Shrub (PSS4)
Palustrine Emergent (PEM1)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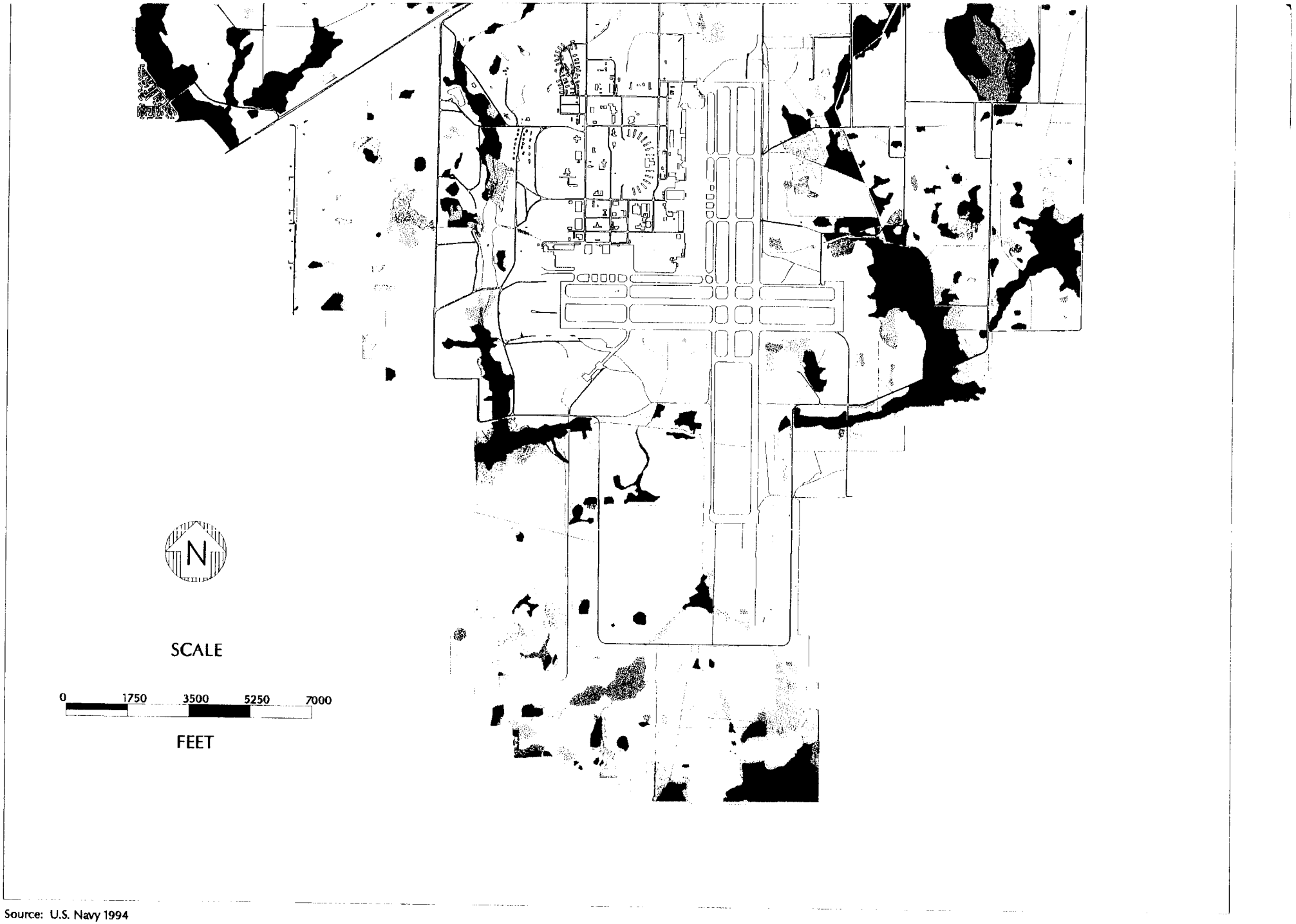


Source: U.S. Navy 1994

(3)

FIGURE 3-7 WETLANDS - MAIN STATION / YELLOW WATER AREA

level, stratified, alluvial sediments derived from erosion of the adjoining uplands drained by these river systems. The soils are rarely inundated but tend to be saturated with a high water table.

Cypress swamps (PF02) occupy a total of 216 acres scattered throughout the station in depressions in pine forests and adjacent to hardwood wetlands. Bald cypress (*Taxodium distichum*) and pond cypress (*T. ascendens*) are dominant species found in this wetland type at the Main Station and Yellow Water Area. The overstory trees on the facility are typically small to medium sized. Groundcover species include cinnamon fern (*Osmunda cinnamomea*), Virginia chain fern (*Woodwardia virginica*), St. John's wort (*Hypericum fasciculatum*), and red root (*Lachnanthes caroliniana*) (Navy 1988). The soils commonly associated with cypress swamps are nearly level, poorly to very poorly drained with coarse to medium textured surfaces.

Bay swamps (PF03) occupy approximately 62 acres of the station and are dominated by broad-leaved evergreen trees that grow in peat-forming depressions, shallow drainageways, and stream bottoms in the vicinity of the Main Station and the Yellow Water Area. Bay swamp areas are typically located at the lower moving headwaters of the various creeks although some bay swamps on the facility are isolated. The typical species in the area include loblolly bay (*Gordonia lasianthus*), sweetbay, swamp bay, and red maple. Other canopy species include sweetgum, Carolina willow (*Salix caroliniana*), Chinese tallow tree (*Sapium sebiferum*), and bald cypress (*Taxodium distichum*). Loblolly bay, sweetbay, swamp bay, red maple, and waxmyrtle (*Myrica cerifera*) dominate the subcanopy. Groundcover species include cinnamon fern, shield fern (*Thelypteris kunthii*), and elderberry (*Sambucus canadensis*) (Navy 1988).

Pine wetlands (PF04) are the second most prevalent wetland type, occupying approximately 980 acres of the station. They are dispersed throughout the Main Station and Yellow Water Area at slightly lower elevations than the surrounding slash forests, and they are typically seasonally flooded (USACE 1988). Slash pine is usually the dominant tree in these low areas, but a mixture of hardwood swamp species may be present (USACE 1988). Typical understory species include slash pine (*Pinus elliottii*), pond pine (*Pinus serotina*), titi (*Cyrilla racemiflora*), waxmyrtle, and gallberry. Standing water, sometimes up to several feet in depth, is common during the rainy season. The soils commonly associated with this community are nearly level, acidic, poorly to very poorly drained, coarse to moderately fine textured, and covered with a thin organic surface layer on low-lying flats.

Palustrine Scrub-Shrub (PSS)

Scrub-shrub wetlands (PSS) are characterized by woody shrubs or low trees (less than 6 meters) where the soil is saturated to the surface or where standing water persists throughout most of the growing season in most years (USACE 1988). At the Main Station and Yellow Water Area, this habitat typically occurs along stream channels on poorly drained substrates and is usually interspersed with other wetland types in low-lying areas. Scrub-shrub wetlands at NAS Cecil Field include broad-leaved deciduous (PSS1); broad-leaved evergreen (PSS3); and needle-leaved evergreen (PSS4).

Approximately 550 acres of scrub-shrub wetland are located on the station. Scrub-shrub wetland is characterized by relatively open canopy with dense understory shrub layers. Typical species include slash pine, red maple, redbay (*Persea borbonia*), sweetbay, swamp bay, sweetgum, waxmyrtle, royal fern (*Osmunda regalis*), gallberry, cinnamon fern, and virginia creeper (*Parthenocissus quinquefolia*).

Palustrine Emergent (PEM)

Approximately 181 acres of palustrine emergent wetlands (PEM) exist at the Main Station and Yellow Water Area. Most occur in the floodplains associated with Sal Taylor Creek, Yellow Water Creek, and Rowell Creek. Emergent wetland areas are also found scattered throughout the station in low-lying pond-like areas with prolonged soil saturation. These areas usually remain saturated or inundated due to the presence of groundwater seeps (ABB-ES 1994). The dominant vegetation in these wetland areas at the Main Station and Yellow Water Area includes arrowheads (*Sagittaria latifolia*), fragrant water lily (*Nymphea odorata*), bog buttons (*Lachnocaulon anceps*), rushes (*Scirpus* spp.), sedges (*Carex* spp.), St. Johns' wort (*Hypericum brachyphyllum*), dotted smartweed (*Polygonum punctatum*), hatpins (*Eriocaulon compressum*), red root, waxmyrtle (*Panicum* spp.), meadowbeauty (*Rhexia virginica*), sundew (*Drosera capillaris*), and pitcher plants (*Sarracenia minor*).

3.3.1.3 Local Wetland Protection Policies

The goals of the Jacksonville Comprehensive Plan are to achieve no further net loss of the natural functions of the city's remaining wetlands; to improve the quality of the city's wetlands resources over the long-term; and to improve the water quality and fish and wildlife values of wetlands (Jacksonville Planning and Development Department 1990). In addition, Clay County's 2001 Comprehensive Plan contains a program to ensure the preservation and protection of wetlands (Clay County 1992). The effectiveness of these wetland resource

protection efforts depends on the programs of other local, regional, state, and federal agencies that have jurisdiction over the natural resources at NAS Cecil Field.

3.3.2 Wildlife

This section describes the wildlife species in northern Florida that are typically associated with the upland and wetland habitats described in Section 3.3.1. This discussion is intended to describe those species most likely to occur within, but not necessarily be limited to, NAS Cecil Field. A list of wildlife species that are known to occur or potentially may occur at the Main Station or Yellow Water Area is presented in Appendix B.

3.3.2.1 Upland Wildlife Habitats

Pine Forest

Pine forest is the most extensive and widely distributed terrestrial habitat in Florida and at NAS Cecil Field (Abrahamson and Hartnett 1990). A broad assemblage of wildlife can be found in pine forests, but very few species are restricted to these habitats. A few of the wildlife species that commonly inhabit pine forests include the pine woods tree frog (*Hyla femoralis*), oak toad (*Bufo quercicus*), Florida box turtle (*Terrapene carolina bauri*), southern black racer (*Coluber constrictor priapus*), eastern diamondback rattlesnake (*Crotalus adamanteus*), brown-headed nuthatch (*Sitta pusilla*), pine warbler (*Dendroica pinus*), great horned owl (*Bubo virginianus*), hispid cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), nine-banded armadillo (*Dasypus novemcinctus*), Virginia opossum (*Didelphis marsupialis*), gray fox (*Urocyon cinereoargenteus*), wild hog (*Sus scofa*), and white-tailed deer (*Odocoileus virginianus*) (Abrahamson and Hartnett 1990; Simmons 1990). Pine forests are often intermixed with cypress swamps and hardwood wetlands. Species that prefer these habitats use pine forests at some time of the year.

Wildlife management of pine forests is often dictated by local forestry practices. Pine forest management designed solely to maximize timber production may conflict with wildlife management principles. For example, intensively managed pine forests usually lack den or cavity trees, dead trees, dead wood on ground, and mast-bearing hardwoods (Jackson *et al.* 1984). As a result, population sizes and bird species richness (abundance and diversity) decrease when natural pine is converted to pine plantation. However, species such as the northern bobwhite (*Colinus virginianus*) are locally common in managed pine forests with an open understory maintained by burning (Abrahamson and Hartnett 1990).

Drier pine forests, such as those dominated by longleaf pine and turkey or bluejack oaks, are fire-maintained habitats that commonly support a large number of wildlife species. Many species have adapted to the dry, sandy, conditions that characterize these areas. Species adapted to xeric habitats tend to be burrow dwellers including the gopher frog (*Rana areolata*), southeastern pocket gopher (*Geomys pinetis*), eastern coachwhip (*Masticophis flagellum*), eastern diamondback rattlesnake, and gray fox.

Dry pine forests need to be burned periodically to maintain their value as wildlife habitats. For example, populations of gopher tortoises (*Gopherus polyphemeus*) thrive on herbaceous vegetation, which is lost in the absence of fire. The practice of fire suppression has resulted in decreased populations of several wildlife species including the red-headed woodpecker (*Melanerpes erythrocephalus*), loggerhead shrike (*Lanius ludorvicianus*), Bachman's sparrow (*Aimophila aestirilis)*, northern bobwhite, and eastern coachwhip.

Hardwood Forest

Hardwood forests, including transitional hardwoods and shrub/brushland areas, generally exhibit a high degree of plant species diversity and provide valuable wildlife habitat. Many of the same wildlife species that inhabit more mesic pine forests also use hardwood habitats. However, on average, hardwood stands produce greater habitat diversity for wildlife than stands of pure pine. For example, dead trees are often more numerous because burning is not routinely conducted in mixed hardwood-pine forests (Jackson *et al.* 1984). Therefore, cavity-dwelling wildlife is often more abundant in these habitats, such as the Carolina chickadee (*Parus carolinensis*), tufted titmouse (*P. bicolor*), Carolina wren (*Thryothorus ludovicianus*), brown-headed nuthatch, black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), eastern screech owl (*Otus asio*), barred owl (*Strix varia*), woodpecker, gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), raccoon (*Procyon lotor*), Virginia opossum, white-tailed deer, and several species of mice.

The composition of canopy-dwelling wildlife species often differs between hammocks and pine forests. For example, gray squirrels tend to be more abundant in hammocks and fox squirrels (*Sciurus niger*) in pine forest. Likewise, red-shouldered hawks (*Buteo lineatus*) and barred owls are common in hardwood forests, whereas red-tailed hawks (*B. jamaicensis*) and great horned owls are more common in pine forests (Simmons 1990). Rotten wood from fallen dead trees creates additional habitat by providing food and cover for lizards, salamanders, snakes, and mice (Jackson *et al.* 1984). Some of the more common amphibians and reptiles include the green anole (*Anolis carolinensis*), Florida box turtle, eastern glass lizard

(*Ophisaurus ventralis*), broadhead skink (*Eumeces laticeps*), ground skink (*Scinella lateralis*), Florida red-bellied snake (*Storeria occipitomaculata*), and rough green snake (*Opheodrys aestivus*) (FNAI 1990).

Disturbed/developed areas are used by wildlife species tolerant of high levels of human disturbance. The most common species are often exotic, such as the house sparrow (*Passer domesticus*), european starling, black rat (*Rattus rattus*), house mouse (*Mus musculus*), rock dove (*Columba livia*), and Mediterranean gecko (*Hemidactylus turcicus*). However, many native species are found in these habitats as well, such as the mourning dove, Carolina wren, northern mockingbird, northern cardinal, blue jay, chimney swift (*Chaetura pelagica*), and gray squirrel.

3.3.2.2 Wetland Wildlife Habitats

Palustrine Forested and Scrub-Shrub Wetlands

Forested and scrub-shrub wetlands are discussed together because most wildlife species present in any one of these wetland cover types generally occupy the other type as well. These habitats provide excellent habitat for a variety of amphibians, reptiles, and birds, but few mammal species are associated exclusively with wetlands. Pronounced wet-dry cycles provide favorable year-round habitat for amphibians and reptiles, and frogs dominate the vertebrate fauna in most inundated wetlands during summer (Ewel 1990). The marbled salamander (*Ambystoma opacum*), eastern mud snake (*Farancia abacura*), and rainbow snake (*Farancia erytrogramma*) are seldom found outside of these habitats. Other species commonly found in inundated wetlands include southeastern five-lined skink (*Eumeces egregius similus*), cottonmouth (*Agkistrodon piscivorus*), anhinga (*Anhinga*), barred owl, hooded warbler, herons, egrets, woodpeckers, wood duck (*Aix sponsa*), eastern coyote (*Canis latrans*), white-tailed deer, bobcat (*Lynx rufus*), and raccoon.

Despite the general overlap of species compositions among wetland habitats found at the station, certain species preferentially use various forested wetlands. For example, the Florida chicken turtle (*Deirochelys reticularia chrysea*) and glossy crayfish water snake (*Regina rigida*) appear to thrive particularly well in cypress swamps (Simmons 1990). The flatwoods salamander (*Ambystoma cingulatum*) primarily inhabits pine wetlands with pools more than other wetland types (Conant and Collins 1975).

Palustrine Emergent Wetland

Palustrine emergent wetlands can be productive habitats for diverse aquatic and terrestrial species. Insects, crayfish, snails, and other invertebrates are plentiful in these habitats and provide an abundant, high-quality food source for vertebrate wildlife. Common species found in these wetland areas include the southern leopard frog (*Rana sphenocephala*), green tree frog (*Hyla cinerea*), Florida green water snake (*Nerodia cyclopion floridana*), swamp snake (*Seminatrix pygaea*), cottonmouth, Florida mud turtle (*Kinosternon subrubrum steindachneri*), Florida cooter (*Chrysemys floridana*), Florida water rat (*Neofiber alleni*), white-tailed deer, herons, egrets, bitterns, rails, ducks, and red-winged blackbirds (*Agelaius phoeniceus*) (Kushlan 1990; Simmons 1990).

3.3.2.3 Fishery Resources

Aquatic habitats at NAS Cecil Field support a diverse fishery community. The station manages five constructed impoundments including Lake Newman, Lake Fretwell, Lake Wright, Lake Yellow Water, and Lake Burrell (Navy 1992). Important game fish (recreation) species in these lakes include largemouth bass (*Micropterus salmoides)*, red ear sunfish (*Lepomis microlophus*), warmouth (*Lepomis gulosus*), channel catfish (*Ictalurus punctatus*), and bullhead (*Ictalurus nebolosus*). Largemouth bass are generally found in shallow, heavily vegetated areas of water bodies. Areas of submerged vegetation are also preferred by young red ear sunfish, whereas older fish inhabit adjoining areas of open water. Channel catfish are generally found in lakes that have adjacent creeks and rivers where adults can spawn. Bullheads tend to inhabit heavily vegetated, more stagnant waters.

3.3.3 Threatened and Endangered Species

This section presents threatened species, endangered species, and species of concern reported to occur or potentially occur at the Main Station and/or Yellow Water Area based on contacts with USFWS (see Appendix C), the Florida Game and Fresh Water Fish Commission (FGFWFC), the Florida Natural Areas Inventory (FNAI), and the Environmental Department of NAS Cecil Field. Federally listed threatened and endangered plant and animal species are protected by the Endangered Species Act of 1973 administered by USFWS. State-listed animal species are protected by Sections 39-27.002 through 39-27.005 of the Florida Administrative Code under the auspices of FGFWFC. State-listed plant species are protected by Sections 581.185 through 581.187 and 581.201 of the Preservation of Native Flora of Florida Act administered by the Florida Department of Agriculture. Legal protective status of

state and federally listed plant and animal species are derived from the *Official Lists of Endangered and Potentially Endangered Fauna and Flora of Florida* (FGFWFC 1994).

Potential habitats of threatened, endangered, and species of concern at the station were determined from site visits and a review of appropriate literature including *Closing the Gaps in Florida's Wildlife Habitat Conservation System* (Cox *et al.* 1994), which is a Geographic Information System (GIS)-based technique that facilitates the identification of strategic habitat conservation areas for the purposes of promoting preservation of biodiversity through conservation of rare, threatened, and endangered plant and animal species and their habitats. As required by Section 7 of the Endangered Species Act (ESA), a biological assessment was conducted to determine the potential occurrences of federally listed plant and animal species at NAS Cecil Field (see Appendix D). The assessment included an on-site survey performed in February 1995; an extensive review of the habitat requirements (foraging and breeding) and diet for species of concern; and an evaluation of the potential impacts to areas of suitable habitat and/or individuals of the identified species. Figure 3-8 identifies the areas of suitable habitat for species of concern at NAS Cecil Field. Table 3-1 identifies the federal and state-listed species of concern that may occur in Duval and Clay counties. It should be noted that habitats of certain species of concern that occur in Duval and Clay counties (e.g., marine habitats) are not present at NAS Cecil Field. Therefore, detailed descriptions of these species (e.g., Florida manatee, sea turtles) have been omitted from the following sections.

3.3.3.1 Animals

The following provides a brief description of the physical characteristics, distribution/range, and habitat requirements for each of the animal species of concern identified by the USFWS and FGFWFC (see Appendix D).

Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake is listed as threatened at the federal and state levels. It is a large snake, often reaching 5 to 7 feet in length, that ranges from peninsular Florida northward through the Florida Panhandle and into the Georgia coastal plain (Conant and Collins 1975). Populations are widely scattered throughout its breeding range (Mount 1976). Except for extreme southern Florida, the eastern indigo snake is typically found in the proximity of gopher tortoise burrows, which the snake uses for shelter during winter months (Mount 1976; Mount *et al.* 1988). A variety of habitats, ranging from xeric to wetland areas,

may be utilized during the summer months. Suitable habitat for the eastern indigo snake exists at the station (see Figure 3-8), but there are no specific records of eastern indigo snakes historically residing within station properties (Moler 1985). No evidence (i.e., skins) or individuals were found during the examination of numerous gopher tortoise borrows using a fiber optic scope (see Appendix D).

Gopher Tortoise (*Gopherus polyphemus*)

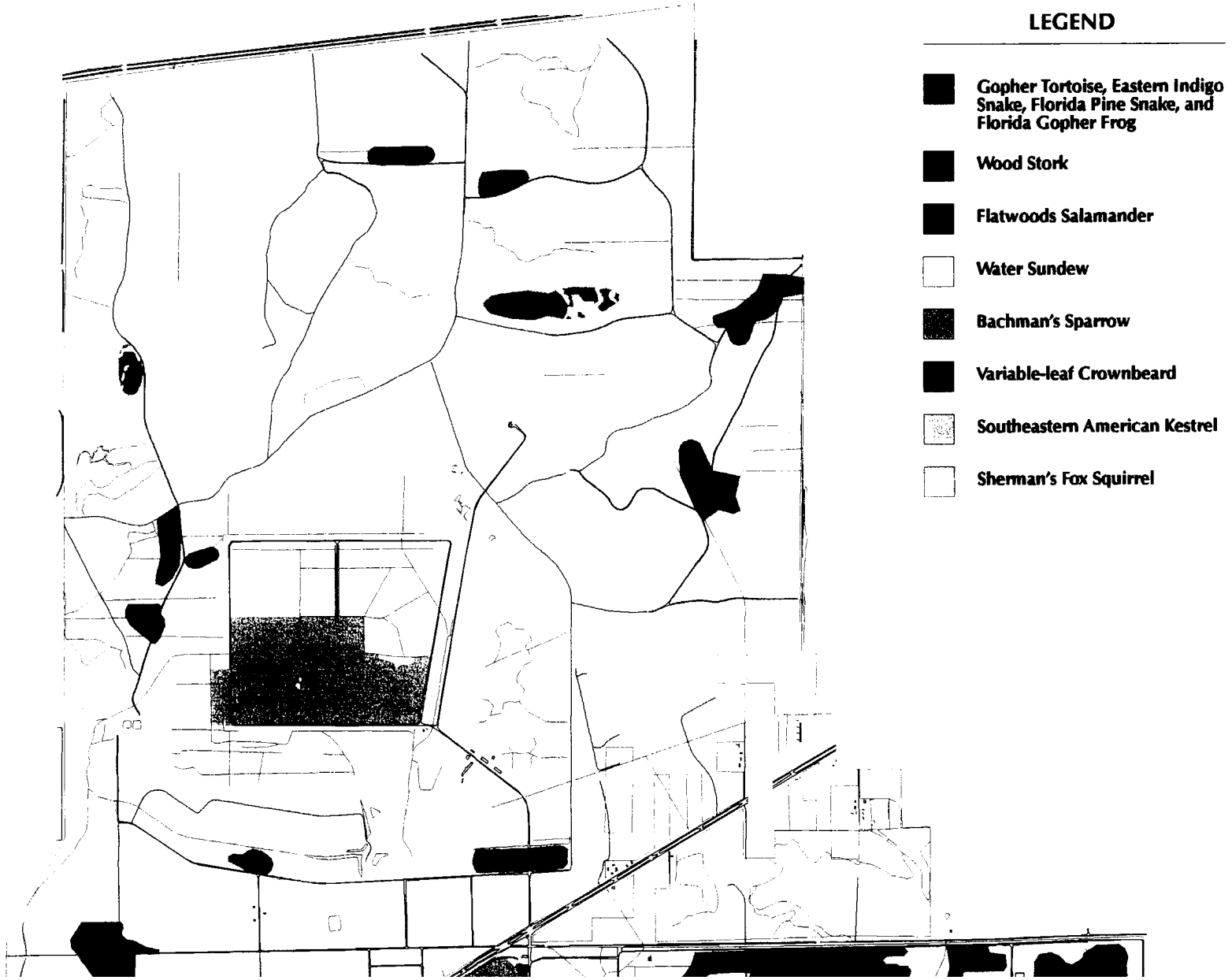
The gopher tortoise is a state species of special concern. It is associated primarily with dry upland pine forest and sandhill habitats throughout its range, which extends across much of the coastal plain of the southeastern United States (Christman 1992). The gopher tortoise creates characteristic burrows which are up to 30 feet long and 12 feet deep (Conant and Collins 1991). As many as 43 species of wildlife have been recorded to use gopher tortoise burrows, and species in certain parts of their range are considered dependent upon gopher tortoise burrows for survival including the Florida mouse, eastern indigo snake, and gopher frog (Cox *et. al.* 1987).

A 1994 gopher tortoise survey was conducted at the station that identified 3,075 acres of suitable habitat at the Main Station and 245 acres at the Yellow Water Area (see Figure 3-8). Estimated population density was 0.43 gopher tortoise per acre at the Main Station, and 0.05 per acre at the Yellow Water Area (CZR, Inc. 1994). The 1995 biological assessment confirmed the presence of active gopher tortoise burrows in the areas identified as suitable habitat (see Appendix D).

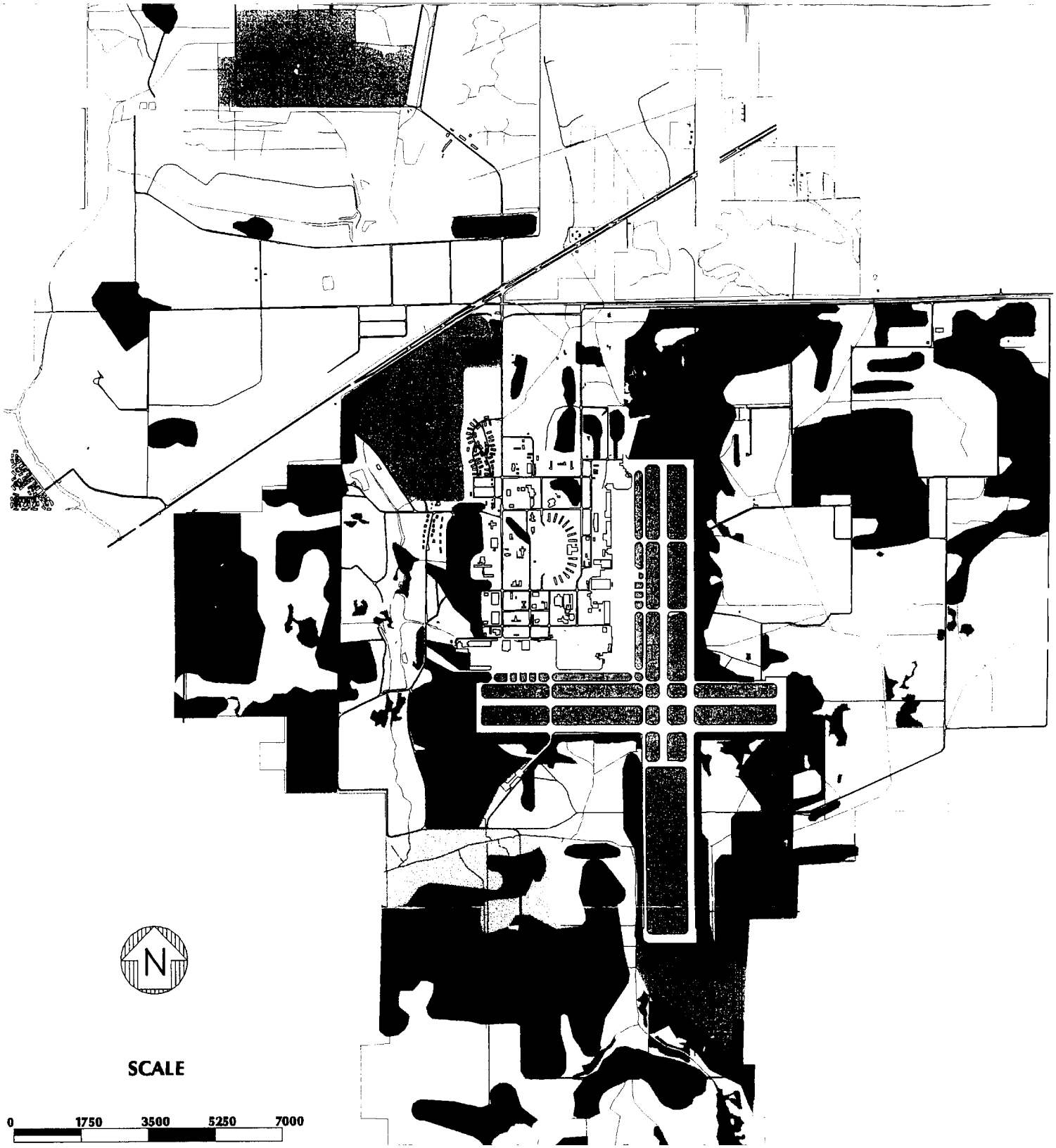
Florida Pine Snake (*Pituophis melanoleucus mugitus*)

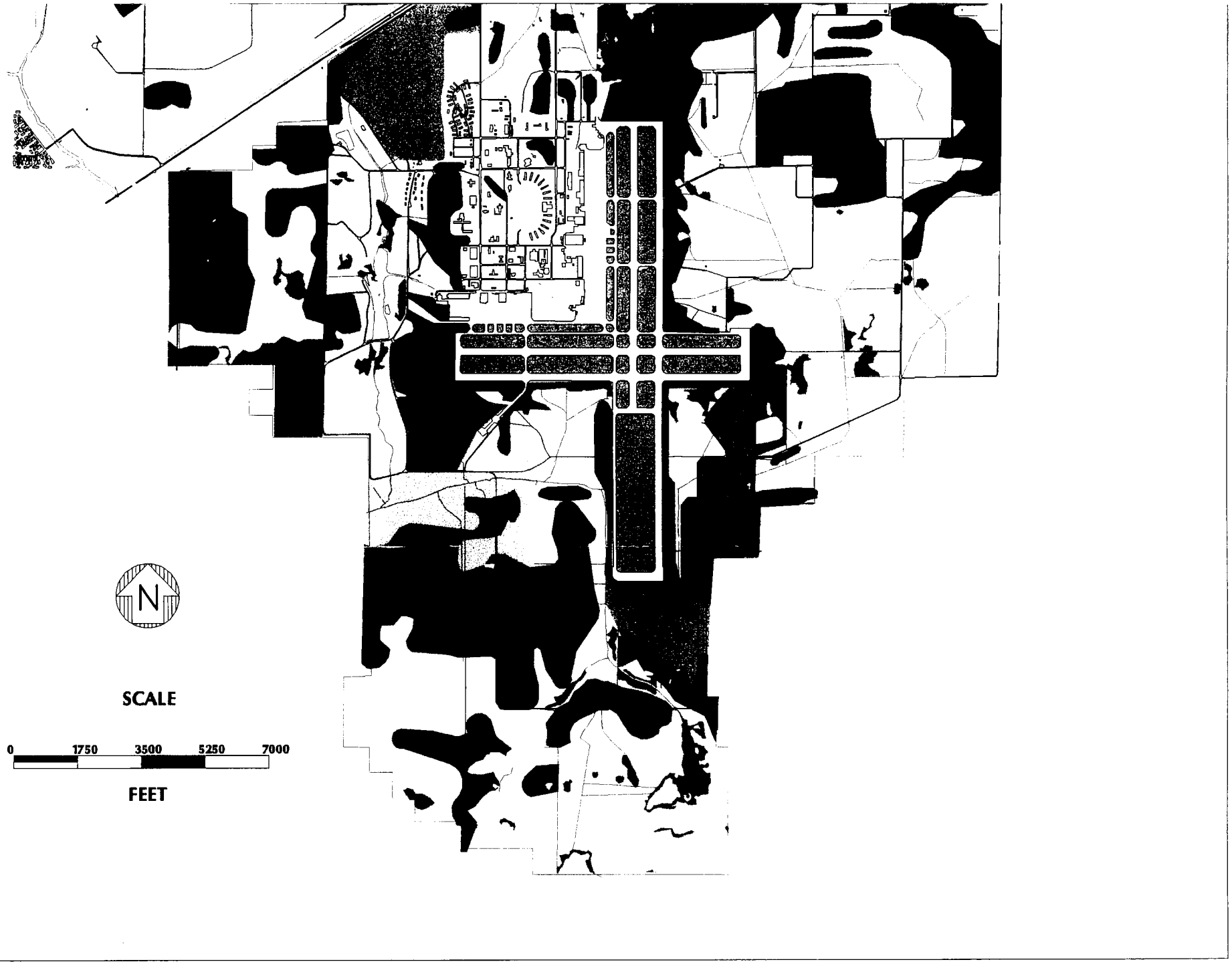
The Florida pine snake is a state species of special concern. The snake is tan or rusty brown in color and 4 to 5 feet long. It ranges from southern South Carolina to southern Florida and inhabits dry, sandy areas in stands of oak or pine, and abandoned fields (Franz 1992). It is an excellent burrower and is associated with gopher tortoise burrows. Extensive dry pine forests with high densities of gopher tortoise burrows provide suitable habitat (Landers and Speake 1980).

Suitable habitat for the Florida pine snake exists at the station (see Figure 3-8). A shedded pine snake skin was collected during the 1995 biological assessment survey (Moler 1995). No individuals were observed.


LEGEND
Gopher Tortoise, Eastern Indigo Snake, Florida Pine Snake, and Florida Gopher Frog
Wood Stork
Flatwoods Salamander
Water Sundew
Bachman's Sparrow
Variable-leaf Crownbeard
Southeastern American Kestrel
Sherman's Fox Squirrel

(2)





Source: ESP 1990; CZR 1994; Ecology and Environment, Inc. 1996

(W)

FIGURE 3-8 SUITABLE HABITAT MAP FOR SPECIES OF CONCERN - MAIN STATION / YELLOW WATER AREA

Table 3-1

FEDERAL AND STATE LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR IN DUVAL AND CLAY COUNTIES, FLORIDA

Species		Status	
Common Name	Scientific Name	USFWS	FGFWFC/FDA
Reptiles and Amphibians			
Eastern Indigo Snake	*Drymarchon corais couperi*	T	T
Gopher Tortoise	*Gopherus polyphemus*	Not listed	SSC
Florida Pine Snake	*Pituophis melanoleucus mugitus*	Not listed	SSC
Florida Gopher Frog	*Rana capito aesopus*	Not listed	SSC
Flatwoods Salamander	*Ambystoma cingulatum*	C2	Not listed
Green Sea Turtle	*Chelonia mydas*	E	E
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	E
Hawksbill Sea Turtle	*Eretmochelys imbricata*	E	E
Leatherback Sea Turtle	*Dermochrlys coriacea*	E	E
Loggerhead Sea Turtle	*Caretta caretta*	E	E
Birds			
Little Blue Heron	*Egretta caerulea*	Not listed	SSC
Snowy Egret	*Egretta thula*	Not listed	SSC
Tricolored Heron	*Egretta tricolor*	Not listed	SSC
White Ibis	*Eudocimus albus*	Not listed	SSC
Wood Stork	*Mycteria americana*	E	E
Red-cockaded Woodpecker	*Picoides borealis*	E	T
Bachman's Sparrow	*Aimophila aestivalis*	C2	Not listed
Southeastern American Kestrel	*Falco sparverius paulus*	Not listed	T
Bald Eagle	*Haliaeetus leucocephalus*	T	T
Florida Scrub Jay	*Aphelocoma coerulescens*	T	T
Piping Plover	*Charadrius melodus*	T	T
Mammals			
Florida Mouse	*Podomys floridanus*	Not listed	SSC
Sherman's Fox Squirrel	*Sciurus niger shermani*	Not listed	SSC
Florida Black Bear	*Ursus americanus floridanus*	Not listed	T
West Indian Manatee	*Trichechus manatus latirostris*	E	E
Invertebrates			
Black Creek Crayfish	*Procambarus pictus*	Not listed	SSC

Table 3-1

FEDERAL AND STATE LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR IN DUVAL AND CLAY COUNTIES, FLORIDA

Species		Status	
Common Name	Scientific Name	USFWS	FGFWFC/FDA
Plants			
Water Sundew	*Drosera intermedia*	Not listed	T
Bartram's Ixia	*Sphenostigma Coelestina*	Not listed	E
Southern Milkweed	*Asclepias viridula*	Not listed	T
Curtiss' Sandgrass	*Calamovilfa curtissii*	Not listed	E
Hartwrightia	*Hartwrightia floridana*	Not listed	T
Lake-Side Sunflower	*Helianthus carnosus*	Not listed	E
Florida Milkweed	*Matelea floridana*	Not listed	E
Chapman's Rhododendron	*Rhododentdron chapmanii*	E	E
St. John's Susan	*Rudbeckia nitida*	Not listed	E
Green Ladies-Tresses	*Spiranthes polyantha*	Not listed	E
Variable-Leaf Crownbeard	*Verbesina heterophylla*	Not listed	T
Fish			
Shortnose Sturgeon	*Acipenser brevirostrum*	E	E

Key:

T = Threatened.
E = Endangered.
C2 = Candidate species for federal listing with some evidence of vulnerability, but for which not enough information exists to justify listing.
FDA = Florida Department of Agriculture.
FGFWFC = Florida Game and Fresh Water Fish Commission.
SSC = Species of Special Concern.
USFWS = United States Fish and Wildlife Service.

Source: FGFWFC 1994; USFWS 1994.

Florida Gopher Frog (*Rana capito aesopus*)

The Florida gopher frog is a state species of special concern. The small, 2- to 4-inch creamy white to brown frog ranges along the coastal plain from southern Georgia to southern Florida. It associates with gopher tortoise burrows during the day, and forages away from them at night (Godley 1992). Suitable habitat exists wherever gopher tortoise burrows are present in dry habitats.

Suitable habitat for the Florida gopher frog exists at the station (see Figure 3-8). However, no individuals or signs of the gopher frog were observed during a survey of active and inactive gopher tortoise burrows located at the station (see Appendix D).

Flatwoods Salamander (*Ambystoma cingulatum*)

The flatwoods salamander is a federal candidate species. This salamander is dark brownish black to gray with variable and irregular whitish, blotchy, and netlike patterns (Conant and Collins 1991). It is distributed in a small area of the southeastern coastal plain from southern South Carolina, across Georgia, to southern Alabama, and south to the northern part of peninsular Florida (Conant and Collins 1991). It occurs in longleaf or slash pine/wiregrass flatwoods adjacent to wetlands with some standing water (Anderson and Williamson 1976).

Although no individuals (larvae or adult) have been observed at the station, suitable breeding habitat for the flatwoods salamander occurs within the Yellow Water Area (Palis 1995) (see Figure 3-8). However, unless the areas are burned periodically to promote the growth of wiregrass, the dense shrub layer would dominate and diminish the salamander's potential habitat.

Long-Legged Wading Birds

Several species of wading birds considered state species of special concern occasionally use wetlands and ponds at the station for foraging. The little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), and white ibis (*Eudocimus albus*) occasionally feed at Lake Fretwell and are likely to occur in other inundated areas and streams at the station.

The state and federally endangered wood stork (*Mycteria americana*) is a rare visitor at Lake Fretwell (Cochran 1995). Wood storks feed in groups, primarily in shallow-water freshwater swamps and marshes, and usually nest in cypress swamps, preferably in the tops of cypress and dead hardwoods (Ogden 1985). Although a small colony of wood storks is

currently located on private property adjacent to the station, the degraded wetland habitat conditions and high levels of human disturbance apparently discourage nesting at the station.

Four cypress-dominated wetlands were identified and characterized during the 1995 biological assessment survey (see Appendix D). According to the survey results, the cypress swamps at NAS Cecil Field contain mostly sapling and pole-sized trees; therefore, wetland habitat conditions at the station are inadequate to sustain a nesting colony of wood storks now or in the foreseeable future. However, a few of the wetland areas at the station provide suitable foraging habitat for the wood stork (see Figure 3-8).

Red-Cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is a federal endangered species and a state threatened species that is limited to the southeastern coastal plain (Baker 1978). This woodpecker has a solid black nape and cap, ladder-back pattern, and large white cheek patches (Robbins *et al.* 1983). The red-cockaded woodpecker typically excavates nesting cavities in longleaf pines 95 to 100 years old, and loblolly pines 75 to 80 years old (Jackson *et al.* 1979). Frequent fires (3 to 5 year interval) are required to suppress the understory hardwood growth which makes an area unsuitable for this species (Jackson 1986).

No red-cockaded woodpeckers are reported to occur at NAS Cecil Field, nor do any individuals occur in the local vicinity (FNAI 1994; Powell 1995). The 1995 biological assessment survey identified two areas of potentially suitable habitat that would require active management (i.e., burning of the understory and shrub layers) if developed for red-cockaded woodpeckers (see Appendix D). However, the lack of woodpeckers in the general vicinity and the absence of suitable habitat preclude the use of the station by red-cockaded woodpeckers.

Bachman's Sparrow (*Aimophila aestivalis*)

The Bachman's sparrow is a federal candidate species. This relatively large sparrow has a buffy breast and reddish brown striped back. It ranges throughout the southeast and Appalachian states into Illinois (Peterson 1980). The Bachman's sparrow is typically found in dry, open pine woods or oak woods, especially mature longleaf pine forests, scrub palmetto, and brushy pastures (Dunning and Watts 1990). However, this sparrow has also been reported to occur in agricultural fields and abandoned fields in northern areas (Dorsey 1976). The microhabitat within the different vegetation types is important with regard to the local distribution of Bachman's sparrow (Dunning and Watts 1990).

Two Bachman's sparrows were observed at NAS Cecil Field during the 1995 biological assessment survey (see Appendix D), and several other individuals have been observed and/or heard at other times (Cochran 1995; Powell 1995). In general, the management of pinelands at the station creates and maintains suitable habitat for this sparrow (see Figure 3-8).

Southeastern American Kestrel *(Falco sparverius paulus)*

The southeastern American kestrel is a state threatened subspecies of the American kestrel (*Falco sparverius sparverius*). The southeastern American kestrel is a small, nonmigratory subspecies endemic to Florida. The largest contiguous tracts of kestrel habitat remaining in Florida extend from Hernando County north to Gilchrist, southern Suwannee, and Columbia counties (Cox *et al.* 1994). In Florida, resident southeastern American kestrels prefer mixed hardwood/pine forests to pure pine forests (Bohall-Wood and Collopy 1986).

No southeastern American kestrels have been observed at NAS Cecil Field (Epstein 1996; Powell 1995). However, the open grassy areas around the airstrips, golf course, and adjacent open pine habitat provide suitable breeding and foraging habitat (see Figure 3-8).

Bald Eagle (*Haliaeetus leucocephalus*)

The southern bald eagle is listed as a federal and state threatened species. Currently, eagles do not nest at the station, and are infrequently observed flying over the station properties (Cochran 1995). However, eagle sightings can be expected based on the vast daily distances bald eagles travel within their home ranges and the fact that approximately 85% of the bald eagle population in the southeast nests in Florida (USFWS 1989).

In the southeastern United States, bald eagles generally prefer to nest within 1 mile of large permanent bodies of water such as coastal areas (Van Meter 1992). Consequently, there is not any suitable breeding habitat for the bald eagle at NAS Cecil Field based on the absence of a large body of water. Likewise, the station is not considered an important foraging area for local or transient bald eagles, although Lake Fretwell may serve as an occasional foraging area.

Florida Scrub Jay (*Aphelocoma coerulescens coerulescens*)

The Florida scrub jay is a state and federal threatened species. This relatively large jay lacks the characteristic crest and white-tipped wing and tail feathers of the more common blue jay (Robbins *et. al.* 1983). The Florida scrub jay is restricted to peninsular Florida. It

resides in oak scrub areas and avoids wet habitats and forests. The sedentary nature of this jay makes natural repopulation very difficult and unlikely (Woolfenden 1978).

No Florida scrub jays have been reported or observed at NAS Cecil Field. Although the openings created by the harvesting of timber benefit the scrub jay, these areas are dominated with pine saplings rather than the preferred oak. Therefore, the limited areas of oak and brushland habitats present at the station are considered to provide only marginal habitat for the Florida scrub jay.

Florida Mouse (*Podomys floridanus*)

The Florida mouse is a state species of special concern. It is a large mouse with naked ears, and its range is limited to peninsular Florida where it inhabits high sandy ridges. It prefers fire-maintained, xeric vegetation on well-drained sandy soils with low scrub and areas with a greater frequency of acorns. The Florida mouse frequently associates with gopher tortoise burrows (Layne 1992).

No Florida mice have been observed or reported at NAS Cecil Field. Although suitable habitat is present at NAS Cecil Field wherever gopher tortoise burrows occur in dry sandhill habitats, these areas do not support the scrub oak vegetation necessary to support the Florida mouse. Therefore, NAS Cecil Field does not provide suitable habitat for this species of concern.

Sherman's Fox Squirrel (*Sciurus niger shermani*)

The Sherman's fox squirrel is a state species of special concern that inhabits sandhill, mixed pine-hardwood, and prairie habitats from southeastern Florida northward to central Georgia and westward to Walton County, Florida (Cox *et al.* 1994). Suitable habitat for the Sherman's fox squirrel (i.e., longleaf pine-turkey oak communities) is lost when older forests are cut and converted to even-age pine plantations (Dickson and Huntley 1987). According to Cox *et al.* (1994), Florida currently possesses the minimum base of habitat composition and area requirements needed to sustain long-term populations of Sherman's fox squirrels in the state.

In general, NAS Cecil Field provides suitable habitat for the Sherman's fox squirrel (see Figure 3-8). Three individuals were observed during the 1995 biological assessment survey: two were located in the sandhill and adjacent slash pine plantation habitats in the Main Station, and the other was observed in the Yellow Water Area (see Appendix D).

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is a state threatened species in all parts of its range, except in nearby Baker and Columbia counties and the Apalachicola National Forest. Populations of Florida black bears appear to be generally stable throughout its range across the state (Cox *et al.* 1994). Black bears use a variety of habitats, including pine forest, oak scrub, sand pine scrub, mixed hardwood-pine, upland hardwood forest, cypress swamps, mixed hardwood swamp, bay swamp, and bottomland hardwood (Cox *et al.* 1994). The Osceola National Forest in Baker and Columbia counties is located 26 miles northwest of the station and supports approximately 157,700 acres of black bear habitat, which could potentially support 32 to 64 breeding adults (Cox *et al.* 1994). Black bears have been known to disperse over long distances (Maehr *et. al.* 1988), but less than 70% of the recorded dispersal events are greater than 35 miles (Cox *et. al.* 1994).

No black bears have been observed or reported at NAS Cecil Field or adjacent areas (FNAI 1994). In general, NAS Cecil Field does not provide any unique or significant areas of potential habitat for the black bear, and is only considered to provide marginal habitat for the occasional transient bear.

Invertebrates

The Black Creek crayfish is the only invertebrate state species of concern identified by the FGFWFC as occurring in Duval and Clay counties (Bentzien 1994). This species is not expected to occur at NAS Cecil Field.

3.3.3.2 Plants

The following provides a brief description of the physical characteristics, distribution, and habitats for the 12 plant species of concern identified by the USFWS and FGFWFC (see Table 3-1). In addition, based on the endangered plant species survey conducted by Environmental Services and Permitting, Inc. (ESP 1990) the occurrence of individual plants or suitable habitat at NAS Cecil Fields is discussed for each plant. Because the habitat requirements for these plants are very general, suitable habitat has not been indicated on Figure 3-8 unless a specific population/location was identified.

Water Sundew (*Drosera intermedia*)

The water sundew is a state threatened perennial herb that characteristically traps and digests insects by means of gland-tipped hairs on the leaf surface. In Florida, the water

sundew ranges throughout the panhandle and the central portion of the peninsula. It inhabits clear streams or ponds as well as bogs, and is closely associated with *Sphagnum* moss (Ward 1979).

The water sundew has been reported at one location in a drainage ditch in the Yellow Water Area east of the Caldwell Branch (FNAI 1994) (see Figure 3-8). The surrounding cover type is sawtimber-sized loblolly pine. Associated species at this location include pink sundew (*Drosera capillaris*), branching hedgehyssop (*Gratiola ramosa*), Elliot's yellow-eyed grass (*Xyris elliotti*), and maidencane (*Panicum hemitomon*) (FNAI 1994; ESP 1990).

Bartram's Ixia (*Sphenostigma coelestinum*)

The State of Florida has listed Bartram's Ixia as endangered, and the City of Jacksonville has named this plant a state-listed species of special interest (Jacksonville Planning and Development Department 1990). Bartram's Ixia is a perennial herb in the Iris family (*Iridaceae*) which blooms for a few hours from dawn to mid-morning. It is characterized by its proportionately large lavender flower (2 inches across) perched upon a tall, delicate stem (12 inches). The plant is only known to occur in seven counties of northeast Florida: Baker, Bradford, Clay, Duval, Putnam, St. Johns, and Union. It grows in pine flatwood depressions and moist pine areas amidst wiregrass (Clewell 1985).

This species has not been observed or reported at NAS Cecil Field (ESP 1990). Although the FNAI records indicate that a small population of this plant occurs at the station, this record was reviewed and determined to be incorrect (Knight 1995).

Southern Milkweed (*Asclepias viridula*)

The southern milkweed is a state threatened species. This narrow, opposite leaved herb is in the Milkweed family (Asceliadaceae), and typically flowers from May to July. It primarily occurs in dry flatwood areas in the panhandle of Florida (Clewell 1986).

No individual and/or populations of southern milkweed were identified during the endangered plant survey (ESP 1990). However, the extensive areas of dry flatwood habitats at NAS Cecil Field, particularly of the Main Station, may provide suitable habitat for this plant species of concern.

Curtiss' Sandgrass (*Calamovilfa curtissii*)

Curtiss' sandgrass is a state threatened species. This perennial grass has narrow leaf blades and can grow to a height of approximately 3 feet. The panicle (i.e., inflorescence) is

narrow with short, strongly ascending branches. This sandgrass occurs in the dry pineland habitats of a few counties in the Florida panhandle (Clewell 1985).

No individual and/or populations of Curtiss' sandgrass were identified during the endangered plant survey (ESP 1990). However, the extensive areas of dry pinelands at NAS Cecil Field, particularly of the Main Station, may provide suitable habitat for this plant species of concern.

Hartwrightia (*Hartwrightia floridana*)

The hartwrightia is a state threatened species that is a member of the composite family (*Asteraceae*). This plant grows to a height of approximately 3 feet. The oblong shaped lower leaves are 3 to 10 inches long, and the upper leaves are small and linear. The white flowers are produced in many-flowered heads and typically bloom from September to November (Clewell 1985). Its primary habitat is mesic and wet flatwoods, bogs, seepage slopes, baygalls, and mesic clearings in select counties of peninsular Florida.

No individuals and/or populations of hartwrightia were identified during the endangered plant survey (ESP 1990). However, the mesic and wet habitats at NAS Cecil Field, especially the pine and hardwood wetlands of the Yellow Water Area, may provide suitable habitat for this plant species of concern.

Lake-Side Sunflower (*Helianthus carnosus*)

The lake-side sunflower is a state endangered species that is a member of the composite family. This perennial sunflower can grow to a height of approximately 3 feet. Its leaves are opposite and are 3 to 6 inches long towards the base, but get progressively smaller and fewer in number toward the inflorescence. The distinctive bright yellow flowers are present in the late summer and fall. This particular sunflower is restricted to northeastern Florida and is typically found in moist to wet pinelands with relatively open overstories and understories (USDA 1983).

No individual and/or populations of the lake-side sunflower were identified during the endangered plant survey (ESP 1990). However, the wet habitats of the Yellow Water Area may provide suitable habitat for this plant species of concern.

Florida Milkweed (*Matelea floridana*)

The Florida milkweed is a state endangered species that is a member of the milkweed family. This plant is a climbing vine rather than an erect herb such as the southern

milkweed. It generally grows to a length of approximately 3 to 6 feet, but it can reach a length of 15 feet. The Florida milkweed has elliptically shaped, opposite leaves and produces a spiny seed pod after flowering between April and August (Clewell 1985). In Florida, this milkweed occurs in mixed upland and hardwood forests throughout the panhandle and peninsula.

No individual and/or populations of Florida milkweed were identified during the endangered plant survey (ESP 1990). However, the extensive hardwood areas at NAS Cecil Field, particularly of the Main Station, may provide suitable habitat for this plant species of concern.

Chapman's Rhododendron (*Rhododendron chapmanii*)

The Chapman's rhododendron is a state and federal endangered species that is similar in appearance to ornamental rhododendrons. This evergreen plant has leaves that are characterized as somewhat scaley on the underside. The rose-colored flowers appear in early spring (USDA 1983). It typically occurs in mesic flatwoods and seepage slopes in Florida.

No individual and/or populations of Chapman's rhododendron were identified during the endangered plant survey (ESP 1990). However, the mesic and wet habitats at NAS Cecil Field, particularly of the Yellow Water Area, may provide suitable habitat for this plant species of concern.

St. John's Susan (*Rudbeckia nitida*)

St. John's Susan is a state endangered species that resembles the common black-eyed susan (*Rudbeckia hirta*). The flowers are actually a composite of many small dark flowers that form a central disk from which the petals flare out. This species is usually found in the flatwood habitats of Florida (Clewell 1985).

No individual and/or populations of St. John's Susan were identified during the endangered plant survey (ESP 1990). However, the flatwood habitats located throughout the Main Station at NAS Cecil Field may provide suitable habitat for this plant species of concern.

Green Ladies-Tresses (*Spiranthes polyantha*)

The green ladies-tresses is a state endangered species that is a member of the orchid family (*Orchidaceae*). This delicate plant is recognized by the greenish-brown flowers

arranged in a spiral along the stem, and typically blooms between February and March (Clewell 1985). It prefers rockland, hammock, and upland mixed forest habitats.

No individual and/or populations of the green ladies-tresses were identified during the endangered plant survey (ESP 1990). However, the dry pine and hardwood habitats at NAS Cecil Field, particularly of the Main Station, may provide suitable habitat for this plant species of concern.

Variable-Leaf Crownbeard (*Verbesina heterophylla*)

The variable-leaf crownbeard is a state threatened species that is a member of the composite family. This plant's leaves are usually opposite or whorled at or below the midstem, and alternate towards the inflorescence. The leaves are generally ovate shaped with the base of the leaf extending down around the stem as a wide wing (Clewell 1985). It occurs in dry pine habitats.

During the endangered plant species survey, one population of the variable-leaf crownbeard was found in the sandhill habitat near the north-south runway of the Main Station (ESP 1990) (see Figure 3-8). Additional individuals and/or populations of this plant species of concern may occur in other dry pineland areas throughout NAS Cecil Field.

3.4 Water Resources

3.4.1 Groundwater

Three principal hydrogeologic units of concern are present at NAS Cecil Field. In descending order these units are the surficial aquifer system, the intermediate aquifer system, and the Floridan aquifer system (Leve 1966).

The surficial aquifer system includes unconsolidated and consolidated strata of Holocene to Late Miocene age and is approximately 50 to 100 feet thick (ABB-ES 1994; Fairchild 1972). The surficial aquifer system consists of an upper and lower water-bearing unit, separated by beds of lower permeability. The upper unit (also known as the water table aquifer) consists of medium to fine grain unconsolidated quartz sand and is found 1 to 10 feet BGS (ABB-ES 1994). The water table aquifer, which is generally present under unconfined conditions, is capable of yielding 10 to 40 gallons per minute (gpm) (Fairchild 1972; Causey and Phelps 1978).

The lower water-bearing unit within the surficial aquifer system (also known as the shallow rock aquifer) is composed of semi-confined shell, limestone, and sand deposits of Pliocene and Upper Miocene age, and it is commonly found at depths of 40 to 100 feet BGS

in Duval County (Fairchild 1972; ABB-ES 1994). This major water-bearing zone in the surficial aquifer system is capable of yielding water at rates of up to 200 gpm (Fairchild 1972; Causey and Phelps 1978). Water from the surficial aquifer system is used primarily for domestic purposes. However, industrial, commercial, and agricultural uses are also prevalent.

Regional recharge to the surficial aquifer system occurs primarily through infiltration of rainwater or from rivers, lakes, or marshes. Local recharge to the surficial aquifer system occurs from surface water infiltration in the undeveloped wooded areas of the Main Station and Yellow Water Area. Water is released from the water table zone by evapotranspiration, infiltration into lower layers, seepage into water bodies, and by pumpage.

The surficial aquifer system is underlain by the intermediate aquifer system, which occurs at depths of 60 to 110 feet BGS in the area of NAS Cecil Field (ABB-ES 1994). The intermediate aquifer system or confining unit consists of sediment of the Miocene Hawthorn group, which has water-producing zones and confining zones that collectively act as a confining unit for the Floridan aquifer system (Franks and Phelps 1979). The Hawthorn group is composed of interbedded phosphatic sand, clay, marl, and limestone. The upper part of the Hawthorn group locally contains a continuous carbonate-rich unit of dolostone which forms an artesian water-bearing unit that is used regionally as a private drinking water source. In the area of NAS Cecil Field, this unit is approximately 15 to 25 feet thick and occurs at depths of 60 to 110 feet BGS, with the shallower depths encountered along incised streams (ABB-ES 1994). The total thickness of the entire Hawthorn group, including the underlying clayey confining beds, exceeds 300 feet in the NAS Cecil Field area (FGS 1991). Regional groundwater flow in the upper producing zone of the Hawthorn group is to the east (Fairchild 1972).

A potential exists for upward discharge of groundwater in the intermediate aquifer into the surficial aquifer system near creeks, such as Rowell Creek and Yellow Water Creek (ABB-ES 1994). However, in areas away from streams, the likelihood of downward discharge of groundwater from the surficial aquifer system into the intermediate aquifer system increases.

The intermediate aquifer system is underlain by the thick limestone layers of the Floridan aquifer system. The Floridan aquifer system is the principal source of groundwater derived for public drinking water in most of northern peninsular Florida (Fairchild 1972). At NAS Cecil Field, at least five public supply wells and an irrigation well extract water from this aquifer system (ABB-ES 1994). In the area of the Main Station and Yellow Water Area, the Floridan aquifer system is composed of (from oldest to youngest) the Oldsmar formation,

the Avon Park formation, and the Ocala Limestone. The Hawthorn group, which forms a confining zone, unconformably overlies the Floridan aquifer system. The top of the limestone of the Floridan aquifer system is encountered at depths from 260 feet BGS and reaches depths of more than 600 feet BGS in Duval County. The aquifer ranges in thickness from 1,500 feet to 2,000 feet (Leve 1966; 1968). The transmissivity of the Floridan aquifer system a few miles east of the station was reported to be 190,000 gallons per day per foot (gpd/ft) (ABB-ES 1994; Geraghty and Miller 1983). Groundwater within the Floridan aquifer system flows east to northeast in the vicinity of NAS Cecil Field (Leve 1966; Geraghty and Miller 1983).

Principal recharge to the Floridan aquifer occurs in an area in the lakes region of southwestern Clay County, eastern Bradford County, and western Alachua County, where the confining beds are either thin or missing. The recharge rate in these areas is approximately 45 million gallons per day (mgd) (Phelps 1984). The groundwater reservoirs in the area are recharged primarily by rainfall outside of the area, and to a lesser extent by rainfall within the area. Because the hydraulic gradient is in all directions away from the principal recharge area, only part of the water moves laterally downgradient through the permeable beds of the aquifer to reach the region. An estimate of recharge to the Floridan aquifer is 3 mgd for an area in eastern Baker County and western Duval County (Phelps 1984). Population growth and industrial expansion have caused the potentiometric surface of this aquifer to decline in recent years (Navy 1988).

The water quality of the Floridan aquifer at the Main Station and Yellow Water Area is considered good (soft water, less dissolved mineral content) because the recharge area is in the western part of Duval County (Navy 1988). However, water quality along the St. Johns River and near the coast in Duval County is poor as a result of high concentrations of chloride and other constituents (Navy 1988). The upper Floridan aquifer system is classified as a G-II aquifer according to guidelines established in Chapter 17-770 of the Florida Administrative Code (FAC). This classification protects groundwater used for potable water supply from contamination. The potability of water from the Floridan aquifer system in the coastal areas of Duval County may be threatened by the intrusion of saltwater as a result of the large quantities of freshwater withdrawn (Fairchild 1978).

The Natural Groundwater Aquifer Recharge Sub-Element of Jacksonville's 2010 Comprehensive Plan provides a long-term goal toward which programs or activities are ultimately directed. The goal of this sub-element is to ensure that an adequate quantity and quality of water is available for potable, commercial, industrial, utility, and agricultural use (Jacksonville Planning and Development Department 1990). In addition, Clay County's 2001

Comprehensive Plan also contains a program to protect the quantity and quality of groundwater resources in Clay County (Clay County 1992).

The objectives and policies in the Natural Groundwater Aquifer Recharge Sub-Element are summarized as follows:

- To identify and address the current and projected future uses of the city's groundwater resources;
- To address the procurement and use of an inventory of the area's groundwater resources so that these resources can be conserved and protected;
- To identify the actions necessary to establish effective well head protection and groundwater recharge area protection programs, including the identification of the aquifer recharge areas and describe specific programs, criteria, and studies necessary to protect the city's groundwater;
- To address the implementation of a City Water Reuse Ordinance and expanded public education and water-conservation programs; and
- To identify and address water-conservation and demand-reduction programs.

The Natural Groundwater Aquifer Recharge goal, objectives, and policies are intended to provide the City of Jacksonville with tools to correct existing problems, such as point sources of pollution and excessive withdrawals, and to avoid anticipated future problems associated with the City's groundwater resources through the year 2010. The effectiveness of these groundwater resource protection efforts will also depend on the programs of other local, regional, state, and federal agencies.

3.4.2 Surface Water

NAS Cecil Field is located within the St. Johns River basin and the St. Marys River basin. The Main Station is located entirely within the St. Johns River basin. The Yellow Water Area lies mostly within the St. Johns River basin, with a small portion lying in the St. Marys River basin (see Figure 3-9). Due to the extremely low gradient and abundance of swampy areas, the surface water divide between the St. Johns River basin and the St. Marys River basin is not well defined.

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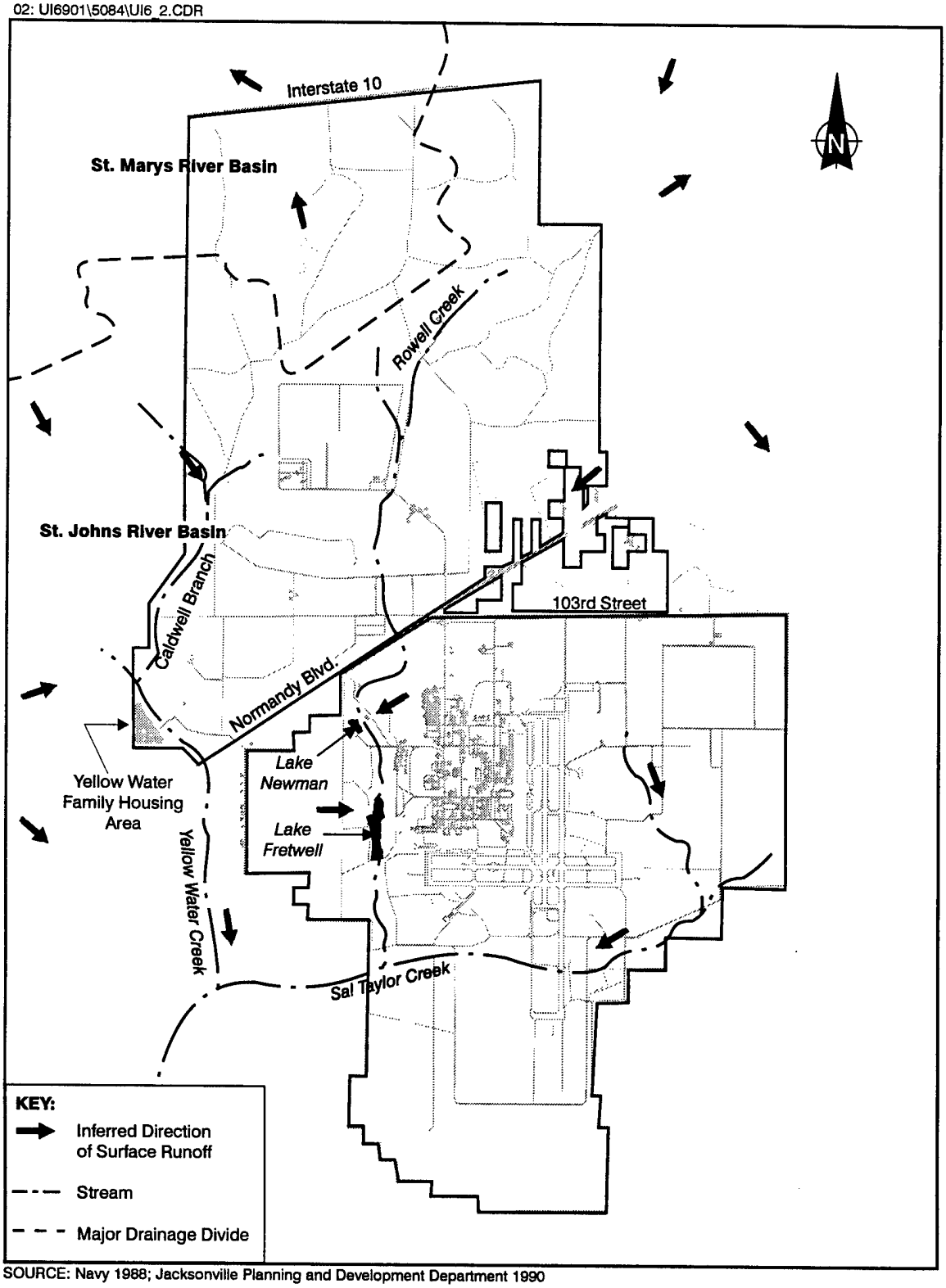


SOURCE: Navy 1988; Jacksonville Planning and Development Department 1990

SCALE

0 3,500 7,000 14,000 Feet

Figure 3-9 MAJOR DRAINAGE BASINS AT MAIN STATION/YELLOW WATER AREA

Most surface water in Duval County is derived from rainfall within the county, except for a small amount of inflow from neighboring Baker County to the west (Anderson 1972). Groundwater infiltration and seepage from springs also contribute substantially to station flow in streams.

Drainage at the Main Station and Yellow Water Area consists of sheet flow across areas of low topographic relief combined with streams and canals of low order (having few to no tributaries) (ABB-ES 1994). In the St. Johns River basin, streams from west to east include Yellow Water Creek, Rowell Creek, and Sal Taylor Creek. Sal Taylor Creek drains the eastern part of the facility, whereas Rowell Creek receives drainage from the central part and flows into Sal Taylor Creek in the south central part of the facility. Sal Taylor Creek then flows west into Yellow Water Creek, which flows southward and joins Black Creek approximately 1.5 miles south of the station boundary. Black Creek eventually flows into the St. Johns River. In the southern half of NAS Cecil Field, swampy areas in the uplands, which are probably perched on locally occurring clayey lenses, are drained by steep-gradient (approximately 40 feet per mile), first-order unnamed tributaries that flow directly into the major creeks.

Sal Taylor Creek has the lowest channel gradient in the area (approximately 5 feet per mile), whereas Rowell Creek (approximately 8 feet per mile) and Yellow Water Creek (approximately 7 feet per mile) both have significantly larger average channel gradients (ABB-ES 1994). The upper reaches of Yellow Water, Rowell, and Sal Taylor creeks tend to have relatively low gradients (approximately 5 feet per mile) and slightly incised streambeds, whereas downstream slopes tend to be greater (approximately 10 feet per mile), and though broad, the streambeds are more deeply incised (ABB-ES 1994).

NAS Cecil Field currently holds a National Pollutant Discharge and Elimination System (NPDES) permit for the temporary operation of a 1.2-mgd wastewater treatment plant, which discharges treated chlorinated effluent to Rowell Creek. A stream-gauging data collection effort is currently being conducted by the United States Geologic Survey (USGS) at NAS Cecil Field in Rowell Creek and Sal Taylor Creek (ABB-ES 1994).

FDEP classifies surface water bodies in order to protect the actual or projected uses of the water. The streams within NAS Cecil Field and Yellow Water Area are considered Class III waterbodies according to guidelines established in Chapter 17-302 of FAC. The five state water quality classifications are defined as follows:

- **Class I:** Potable water supplies;
- **Class II:** Shellfish propagation or harvesting;

- **Class III:** Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife;
- **Class IV:** Agricultural water supplies; and
- **Class V:** Navigation, utility, and industrial use.

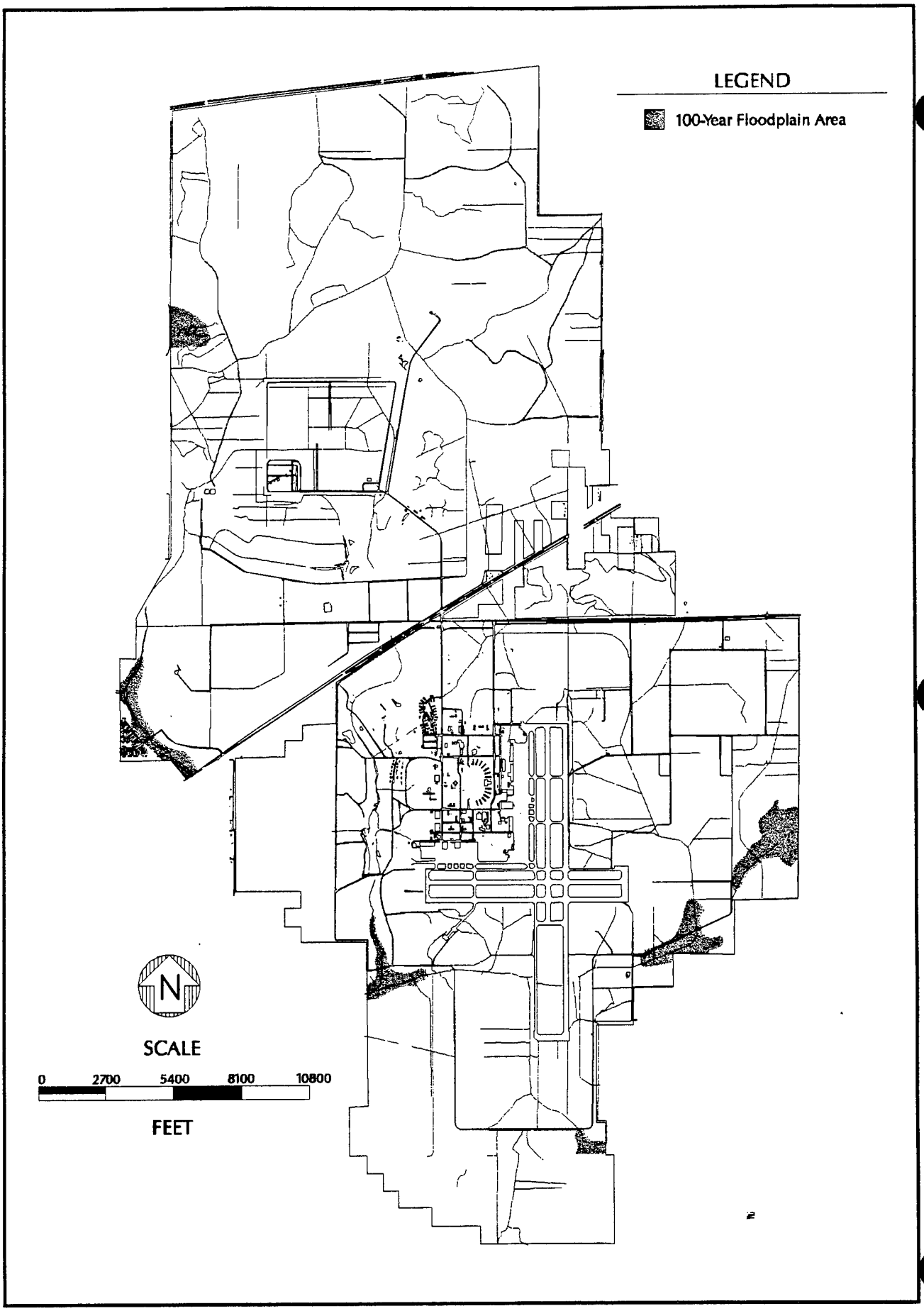
The goal of the Jacksonville Comprehensive Plan is to protect the existing streams, rivers, and floodways as a part of its development review process to ensure that no harm is done to the natural drainage system. The Water Quality Attainment Plan, adopted by City Council in October 1987, provides background data and descriptions of current conditions, and outlines general goals and objectives to be considered to attain water quality standards in Jacksonville (Jacksonville Planning and Development Department 1990). In addition, the Clay County 2001 Comprehensive Plan also contains a program to provide comprehensive monitoring and protection of county waters, as well as methods to ensure the continuing natural functions of waterbodies, wetlands, and floodplains (Clay County 1992).

3.4.3 Floodplains

Extensive floodplain areas exist in the Jacksonville area because of its slight elevation above sea level and the relatively flat topographic relief of the land surface. The flood-prone areas in the vicinity of Main Station and Yellow Water Area are generally the result of flat, poorly drained land where accumulated rainfall runs in a sheet flow or ponds on the surface. These areas are associated with the stream and wetland areas. The streams comprising most floodplain areas at the Main Station and the Yellow Water Area are Sal Taylor Creek, Rowell Creek, and Yellow Water Creek. The 100-year floodplain at the Main Station and Yellow Water Area is shown on Figure 3-10, based on data obtained from the National Flood Insurance program.

According to Flood Insurance Rate Maps generated by the Federal Emergency Management Agency (FEMA), the 100-year floodplain areas located on the Main Station and Yellow Water Area are located in Flood Zone AO, which may result in flood depths of 1 to 3 feet (usually sheet flow on sloping terrain) (HUD 1989). The 100-year floodplain covers small portions of the Main Station and Yellow Water Area. The remainder of the area is located in Zone X, which encompasses areas determined to be outside of the 500-year floodplain.

The area surrounding NAS Cecil Field contains some of the highest elevations in Duval County, but extensive flood hazard zones are located west of Yellow Water Creek. McGirts Creek and the Ortega River form a major floodplain area that extends from Old



Source: U.S. Department of Housing and Urban Development, 1981.

Figure 3-10 100-YEAR FLOODPLAIN - MAIN STATION / YELLOW WATER AREA

Plank Road southeast to the Clay County line and then curves toward the northeast where it meets the Cedar River and then enters the St. Johns River.

The City of Jacksonville has a floodplain regulation in Chapter 652 of the Ordinance Code (Jacksonville Planning and Development Department 1990). The regulation addresses construction and building codes within certain zones as determined by the Flood Insurance Rate Maps developed by FEMA. The intent of the floodplain regulation is to limit or minimize damage to structures caused by floods and to avoid contamination of waters by waste disposal systems. In addition, Clay County's 2001 Comprehensive Plan also contains a program to ensure the preservation and protection of floodplains (Clay County 1992).

3.5 Climate and Air Quality

3.5.1 Climate

NAS Cecil Field is located approximately 40 miles inland from the Atlantic Ocean. The nearness of the ocean and easterly winds, which blow on average 40% of the time, produce a maritime influence that tempers the summer and winter temperatures. The summer months are hot and humid, while the winter months are mild. The infrequent invasion of cold air from the north occasionally causes temperatures to dip below freezing.

Table 3-2 summarizes the average and extreme meteorological conditions for Jacksonville including the annual maximum and minimum temperatures for the area. The annual average temperature for Jacksonville is 68° (USDC 1987). The greatest rainfall occurs during the summer usually in the form of afternoon thunderstorms. More than 0.1 inch of precipitation occurs approximately 115 days each year. Measurable snowfall is rare (USDC 1987).

Prevailing winds are northeasterly in the fall and winter, and southwesterly during the spring and summer. Wind speeds average just over 8 mph and are usually 2 to 3 mph greater in the afternoon than in the early morning hours. Hurricanes can occur in the NAS Cecil Field area. However, this section of the Florida coast has been fortunate in escaping hurricane force winds. Most hurricanes reaching this latitude on Florida's east coast have either lost much of their fierceness before reaching this area, or have tended to move parallel to the coast some distance away from the mainland (USDC 1987).

Table 3-2

AVERAGE AND EXTREME METEOROLOGICAL CONDITIONS AT NAS CECIL FIELD[a]

	Temperature (°F)		Precipitation (inches)	Winds	
	Maximum	Minimum	Total	Direction	Speed (mph)
Annual average	78.7	57.2	52.86	NW[c]	8.1
Extreme	105.0	7.0	10.17[b]	N	61 (gust)

[a] Based on 47-year record for Jacksonville, Florida, from 1940 to 1987.
[b] Maximum 24-hour measurement.
[c] Through 1963.

Source: U.S. Department of Commerce 1987.

3.5.2 Air Quality

3.5.2.1 Regional Air Quality

NAS Cecil Field is under the jurisdiction of the Jacksonville/Duval County local air quality program administered by the Regulatory and Environmental Services Department (RESD). The air quality in Duval County is classified as attainment or unclassifiable/attainment for all pollutants (FAC Title 62-275.40), indicating that the county is in compliance with, or has attained, air quality standards.

Jacksonville was formerly classified as "marginal" nonattainment by EPA, indicating a level of ozone in the area which was slightly higher than National Ambient Air Quality Standards (NAAQS). No exceedance of the ozone air quality standard has occurred since June of 1988 (City of Jacksonville 1994). Thus, the county/city has received an official redesignation from the EPA to transition from nonattainment to attainment for ozone. The county is designated as an ozone "maintenance" area, indicating that the city/county must demonstrate that ozone concentrations will continue to be below NAAQS.

A summary of the baseline for emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_x), and carbon monoxide (CO) in Jacksonville, Florida, are shown in Table 3-3.

3.5.2.2 Air Quality Regulations

In maintenance and nonattainment areas, federal actions are required to conform with applicable State Implementation Plans (SIPs) developed in response to the Clean Air Act as amended in 1990. The criteria and procedures for demonstrating conformity are explained in the General Conformity Final Rule (40 CFR Parts 6, 51, and 93).

An applicability analysis is used to determine whether a full conformity determination is required. Provisions in the conformity rule allow for exemptions from performing a full conformity determination if total emissions of individual pollutants resulting from the action fall below specific threshold values or *"de minimis"* levels. These values are based on the severity of nonattainment. For the NAS Cecil Field area, the ozone transitional nonattainment designation places a 100 tons/year threshold value on both VOC and NO_x emissions (i.e., the precursor chemicals for ozone formation) to determine whether a full conformity analysis is required. Both stationary and mobile emission sources must be considered in the analysis.

In addition to the de minimis exemption, many other exemptions are also available, as listed in 40 CFR Part 51.853. The actions covered by these additional exemptions include, among others, transfers of land using an enforceable contract (or lease) where the federal

Table 3-3

BASELINE EMISSIONS FOR TOTAL VOCs, NO_x, AND CO IN JACKSONVILLE

Source Type	Pollutant Emissions (tons/year)		
	VOCs	NO_x	CO
Point Source	5,448	45,752	14,901
Area Source	18,655	3,054	2,769
Mobile Source	39,062	30,101	286,210
Total	63,165	78,907	303,880

Key:

CO = Carbon monoxide.
NO_x = Nitrogen oxides.
VOCs = Volatile organic compounds.

Source: FDEP 1990.

agency does not retain authority to control emissions associated with these lands or any facilities located on these lands.

Under Title V of the Clean Air Act amendments, all major sources or facilities are subject to the state's Title V program. A major source/facility is defined as any emission source or facility having the potential to emit 100 tons/year or more of any regulated pollutant, 10 tons/year or more of any single hazardous air pollutant (HAP), or 25 tons/year or more of any combination of HAPs. Only stationary emission sources are to be included in the Title V determination. NAS Cecil Field falls under the jurisdiction of the Jacksonville/Duval County local program, and FDEP has delegated the Title V permit processing to the Jacksonville/Duval County RESD. NAS Cecil Field is classified under Title V as a major source of NO_x, sulfur dioxide (SO_2), and CO emissions (U.S Navy 1995).

3.5.2.3 Air Emission Sources

Several types of stationary and mobile emission sources operate at NAS Cecil Field. There are 149 stationary emission sources which include external combustion equipment, internal combustion equipment, surface coating operations, solvent processes, other VOC sources including storage tanks, and miscellaneous operations (woodworking, welding, abrasive blasting, etc.) (Navy 1995). A summary of the pre-closure criteria pollutants emitted from stationary sources at NAS Cecil Field are shown in Table 3-4.

Mobile sources at NAS Cecil Field include aircraft operations and vehicle travel on the air station. Aircraft supported by NAS Cecil Field include one C-12, 52 S-3 Vikings, 181 F/A-18 Hornets, and four T-34Cs. Over 175,000 air operations were conducted with these aircraft during 1993. A summary of the facility's aircraft operations and resulting VOC and NO_x emissions are shown in Tables 3-5, 3-6, and 3-7.

The use of personally owned vehicles (POVs) also contributes to the mobile source emissions resulting from operation of NAS Cecil Field. The majority of the emissions result from POVs used for round-trip work commutes by military and civilian personnel. Annual emissions from these commutes are based on emission factors and the annual average of miles travelled. The number of vehicle miles travelled (VMT) was calculated based on the off-base residential distribution shown in Table 3-8. Average VMT per round trip commute were estimated using an average residence location (based on zip code) and most direct surface street route to and from the base. The emissions generated by workers commuting are shown in Table 3-9.

A summary of total pre-closure air pollutant emissions of NO_x, VOC, and CO including contributions from stationary sources, aircraft, and automobiles used to commute to

Table 3-4

SUMMARY OF PRE-CLOSURE ANNUAL EMISSIONS OF CRITERIA POLLUTANTS FROM STATIONARY SOURCE CATEGORIES AT NAS CECIL FIELD
(Tons per year)

Source Category	Nitrogen Oxides		Sulfur Dioxide		Carbon Monoxide		Particulate Matter		VOCs	
	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential
External combustion	8.7	61.4	0.04	108.2	2.2	15.3	0.2	3.3	0.2	1.2
Internal combustion	15.1	33.1	1.72	4.43	78.2	146.3	9.52	21.64	21.9	37.9
Surface coating and solvent use	NA	NA	NA	NA	NA	NA	NA	NA	7.7	15.2
Fugitive VOC sources	NA	NA	NA	NA	NA	NA	NA	NA	50.2	87
Miscellaneous	9.1	42.6	3.1	9.1	2.1	9.7	NA	NA	5.5	7.0
Total	32.9	137.1	4.86	121.73	82.5	171.3	9.54	24.94	85.5	148.3

Key:

NA = Not applicable.
VOCs = Volatile organic compounds.

Source: Air Emissions Compliance Audit Report, NAS Cecil Field, May 1995.

Table 3-5

AIRCRAFT OPERATION DATA AT NAS CECIL FIELD

Aircraft Type	Annual LTO Cycles	Time in Mode (minutes)/LTO[b]					
		Taxi/Idle Out	Takeoff	Climbout	Approach	Taxi/Idle In	Total
C-12	736	18	0.5	2.5	4.5	7	33.5
F/A-18	133,216	6.5	0.4	0.5	1.6	6.5	15.5
S-3[a]	38,272	6.5	0.4	0.5	1.6	6.5	15.5
T-34C	2,944	6.5	0.4	0.5	1.6	6.5	15.5
Total	175,168	NA	NA	NA	NA	NA	NA

[a] Currently located at NAS Cecil Field. Aircraft to be transferred to NAS Jacksonville in 1998.
[b] Default values used for Time in Mode (EPA 1992).

Key:

LTO = Landing and takeoff.
NA = Not applicable.

Source: EPA 1992.

Table 3-6

EMISSION FACTORS FOR AIRCRAFT OPERATING MODES[a]

Aircraft	Mode	Fuel Flow (lb/min)	Emissions (lb/1,000 lb fuel)	
			VOCs	NO_x
C-12	Taxi out/idle	2.5	101.6	2.0
	Take off	8.5	1.8	8.0
	Climbout	7.9	2.0	7.6
	Approach	4.6	22.7	4.7
	Taxi in/idle	2.5	101.6	2.0
F/A-18 Hornet	Taxi out/idle	10.4	58.2	1.2
	Take off	473	0.1	9.2
	Climbout	135	0.3	25.2
	Approach	109	0.4	14.8
	Taxi in/idle	10.4	58.2	1.2
S-3 Viking	Taxi out/idle	8.1	15	1.7
	Take off	6.3	0.4	7.5
	Climbout	7.7	2.6	3.4
	Approach	38	1.7	6
	Taxi in/idle	8.1	15	1.7
T-34C[b]	Taxi out/idle	10.4	58.2	3.2
	Take off	473	0.1	4.8
	Climbout	135	0.3	19.6
	Approach	109	0.4	10.7
	Taxi in/idle	10.4	58.2	3.2

[a] Data from EPA mobile source emission document (EPA 1992).
[b] Assumed to be similar to the F/A-18 because there is no emission data for the T-34C.

Key:

lb = Pound.
min = Minute.
VOCs = Volatile organic compounds.
NO_x = Nitrogen oxides.

Source: EPA 1992.

Table 3-7

PRE-CLOSURE EMISSION ESTIMATES FOR AIRCRAFT AT NAS CECIL FIELD

Aircraft	Number of LTO/yr per Aircraft	Number of Aircraft	Emissions Estimate			
			VOC		Nitrogen Oxides	
			Per LTO (lb)	Total (tpy)	Per LTO (lb)	Total (tpy)
C-12	736	1	0.91	0.3	37.49	13.8
F/A-18	736	181	7.97	531.1	6.19	412.3
S-3	736	52	1.69	32.3	0.58	11.1
T-34C	736	4	0.25	0.4	0.45	0.7
Total	NA	238	NA	564.1	NA	437.9

Key:

lb = Pound.
LTO = Landing and take offs.
NA = Not applicable.
tpy = Tons per year.

Source: EPA 1992; Ecology and Environment, Inc., 1996.

Table 3-8

NAS CECIL FIELD RESIDENCE DISTRIBUTION AND VEHICLE MILES TRAVELED

Residence Location	Employee Population[a]	Average VMT per Round Trip Commute	Work Days per Year	Annual VMT
On-Base	2,000	0	260	0
Off-Base - Duval Co.	4,387	10.9	260	12,432,758
Off-Base - Clay Co.	1,742	30.3	260	13,723,476
Off-Base - Other	166	50	260	2,158,000
Total	8,295	NA	NA	28,314,234

[a] Includes contractors working at NAS Cecil Field.

Key:

NA = Not applicable.
VMT = Vehicle miles traveled.

Source: Ecology and Environment, Inc. 1996.

Table 3-9

VEHICLE EMISSION FACTORS AND EMISSIONS GENERATED BY WORKER COMMUTES

	Vehicle Emission Factors (gm/mile)	Total Emissions (tons/year)
VOCs	1.97	61.4
NO_x	2.60	81.1
CO	25.7	801.4

Key:

CO = Carbon monoxide.
NO_x = Nitrogen oxides.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc. 1996.

and from the base is shown in Table 3-10. Sources at NAS Cecil Field currently emit 711.1 tons of VOCs, 551.9 tons of NO_x, and 883.9 tons of CO annually.

3.6 Noise

The most significant source of noise at the station is the aircraft operations. The station and areas surrounding the station have land uses that are generally incompatible with flight operations. In response to this problem, the DoD has established the AICUZ Program (Navy 1988). The program consists of a series of elements, including:

- Development of a detailed description of the aircraft noise environment and location for potential aircraft accidents;
- Identification of incompatible and compatible development surrounding the station;
- Development of a series of mitigating strategies to ameliorate or eliminate areas of conflict; and
- Development of a continuing dialogue with local officials of surrounding communities to achieve a mutual understanding of how to best ensure continued growth of both the station and these communities without adversely affecting each other.

Noise is generally defined as sound pressure with an intensity that is greater than the ambient or background sound pressure. It is determined by measuring noise emissions in terms of the sound pressure in a relationship defined as a decibel (dB). The A-weighted decibel (dB[A]) scale is typically used to describe environmental noise. The dB(A) scale is used to measure the amplitude of both continuous and intermittent sounds in a way that corresponds to healthy human hearing (May 1978).

Noise impact studies conducted in conjunction with the AICUZ Program utilize the day-night average sound level (Ldn), to define acceptable noise levels. This measurement is used to define cumulative daily noise exposure, which may fluctuate during a 24-hour period. Because noise is more intrusive at night, the Ldn has a 10 dB(A) weighting factor applied to nighttime hours.

To determine existing noise levels, Ldn measurements have been collected at various points surrounding the station and developed into corresponding noise level contours to illustrate noise exposures over various land areas (Navy 1988). These contours are utilized to establish three noise zones under the AICUZ program, reflecting expected public annoyance levels associated with greater or lesser noise levels. These include:

Table 3-10

SUMMARY OF PRE-CLOSURE EMISSIONS FROM NAS CECIL FIELD
(tons per year)

	VOCs	NO_x	CO
Stationary Sources	85.5	32.9	82.5
Aircraft	564.2	437.9	NA
Personal Vehicles[a]	61.4	81.1	801.4
Total	711.1	551.9	883.9

[a] Emissions based on home-work commuting.

Key:

CO = Carbon monoxide.
NA = Not applicable.
NO_x = Nitrogen oxides.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc. 1996.

- Noise Zone 3, with noise levels greater than 75 Ldn, having the most severe noise levels;
- Noise Zone 2, with noise levels between 65 and 75 Ldn, having a moderate level of impact; and
- Noise Zone 1, with noise levels below 65 Ldn, which is generally considered suitable for noise-sensitive uses such as residences.

Figure 3-11 illustrates current Noise Zones at the station. The Main Station and Yellow Water Area are primarily within Zones 3 and 2. Levels of noise associated with Zone 3 affect even human conversation in sound-attenuated buildings and has a very high annoyance factor (Navy 1988).

3.7 Socioeconomics and Community Services

3.7.1 Population Characteristics

NAS Cecil Field is located in Duval and Clay counties, Florida, and within the Jacksonville Metropolitan Statistical Area (MSA) which is composed of Clay, Duval, Nassau, and St. Johns counties.

As of fiscal year (FY) 1995, 6,622 active-duty military personnel, including 691 officers and 5,931 enlisted personnel, were stationed at NAS Cecil Field. In addition, 813 civilians and 342 contractor personnel were employed full-time at the station, and 518 reservists (82 officers and 436 enlisted personnel) were assigned to NAS Cecil Field (Grimm 1994a).

The three largest commands located at NAS Cecil Field are the Naval Air Station, Strike Fighter Wing Atlantic Fleet (COMSTRKFIGHTWINGLANT), and Sea Control Wing Atlantic Fleet (COMSEACONWINGLANT), which accounted for 23.6%, 41.7%, and 22.6% of the total active-duty personnel stationed at NAS Cecil Field, respectively. Other commands and tenants account for approximately 12.1% of the total military personnel strength of NAS Cecil Field (see Table 3-11).

Approximately 2,000 military personnel reside at NAS Cecil Field in the bachelor and family housing units located throughout the station (Pierce 1994). A total of 131 bachelor officer quarters, 2,218 bachelor enlisted quarters, and 297 family housing units are located on NAS Cecil Field including the Yellow Water Family Housing Area (Houston 1994b; Pomper 1994; Pierce 1994).

The majority of military and civilian personnel employed at NAS Cecil Field reside in Duval County, including those persons who reside on-station. Table 3-12 shows the

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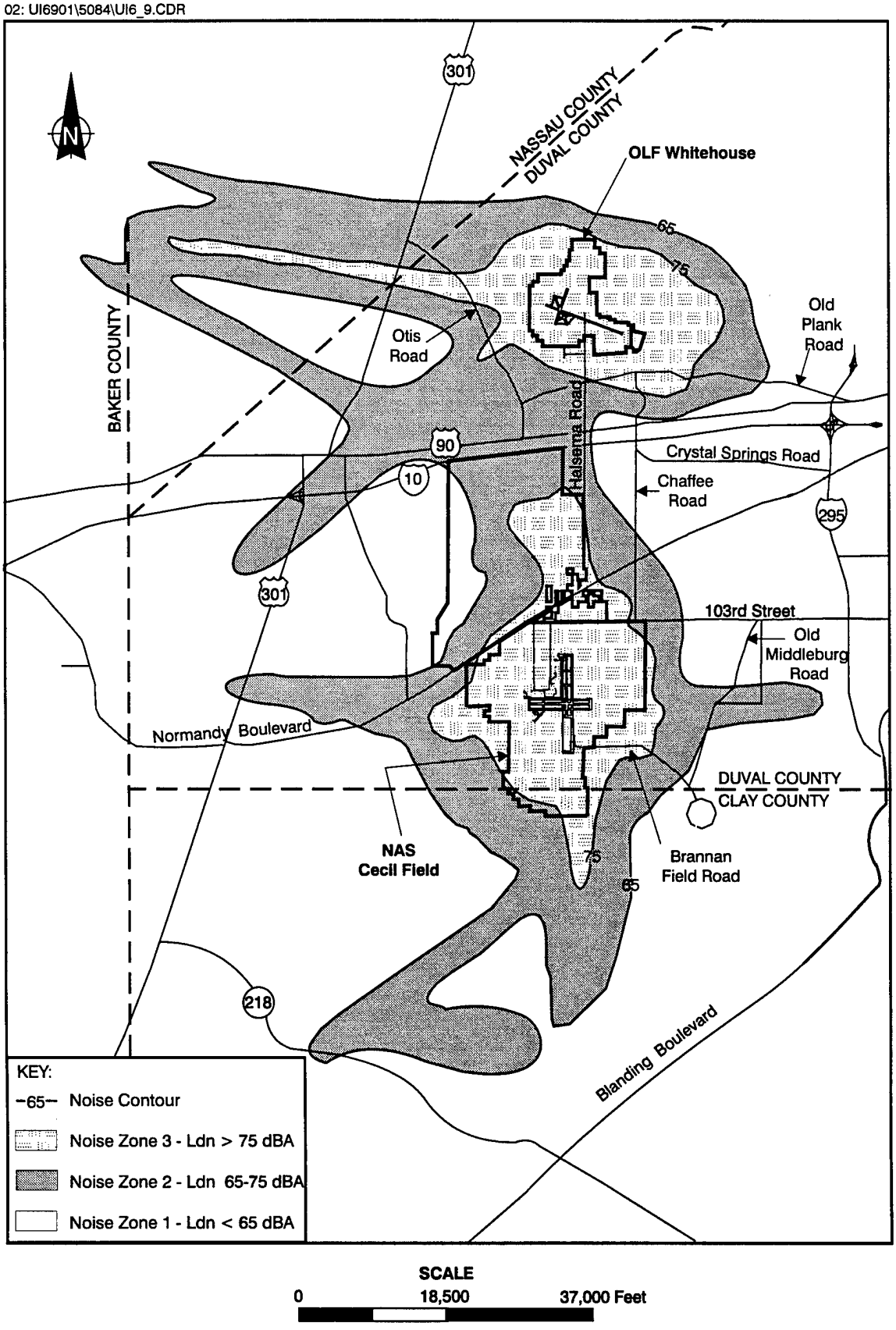

Figure 3-11 NOISE CONTOURS AND AICUZ ZONES

Table 3-11

TOTAL PERSONNEL STATIONED AT NAS CECIL FIELD AS OF FY 1995 (BY MAJOR COMMAND)

Command/Tenant	Officers	Enlisted	Total Personnel
Naval Air Station	45	1,516	1,561
COMSTRKFIGHTWINGLANT	358	2,404	2,762
COMSEACONWINGLANT	228	1,267	1,495
Other Commands/Tenants	60	744	804
Total Full-Time Personnel	691	5,931	6,622
Reservists (all commands)	82	436	518
Total Full-Time and Reserve Personnel Stationed at NAS Cecil Field	773	6,367	7,140

Source: Grimm 1994a.

Table 3-12

DISTRIBUTION OF CIVILIAN AND MILITARY PERSONNEL STATIONED AT NAS CECIL FIELD BY PLACE OF RESIDENCE

County	Percent of Personnel Residing in County
Duval	76.8
Clay	20.5
Bradford	0.7
Baker	0.6
Putnam	0.2
Nassau	0.1
St. Johns	0.1
Volusia	0.1
Marion	0.1
Union	0.1
Escambia	0.1
Columbia	0.1
All others	0.5
Total	100.0

Note: Based upon a sample of NAS Cecil Field personnel taken in November 1994.

Source: Grimm 1994b.

geographic distribution by place of residence personnel assigned to NAS Cecil Field. Approximately 77% of the station population resides in Duval County, the majority of which reside within the City of Jacksonville. Nearly 21% of the total military and civilian work force employed by NAS Cecil Field reside in Clay County. The remaining 2% of the work force resides in other counties located throughout the State of Florida.

Duval County is the most populated county in the Jacksonville MSA. In 1990 the total population of the county was 672,971 residents, representing an increase of nearly 18% over the 1980 total population of approximately 571,000 residents. Despite the substantial increase in population between 1980 and 1990, Duval County was the slowest growing county in the Jacksonville MSA. Between 1980 and 1990, St. Johns County experienced a 63.4% increase in its population to reach a total population of 83,829 residents by 1990. Similarly, Clay County's total population increased 58% from 67,100 residents in 1980 to 105,986 residents in 1990 (see Table 3-13).

The rapid expansion of the Jacksonville MSA is expected to continue through the year 2005. According to population estimates developed by the University of Florida, the Jacksonville MSA is expected to experience a population increase of approximately 23.7% from 1990 to 2005. Duval County is expected to increase at a slower rate than the Jacksonville MSA, with a projected increase of 16.9% from 1990 to 2005. By contrast, St. Johns County and Clay County are expected to experience more rapid population growth than the MSA as a whole with projected increases of 47.4% and 45.2%, respectively, during the 15-year period (see Table 3-14).

The demographic composition of residents in zip code areas adjacent to NAS Cecil Field is shown in Table 3-15. In all cases, the dominant racial group is caucasian. In most areas, there are relatively fewer blacks and slightly more Native Americans and Asians/Pacific Islanders residing in these zip code areas than in Clay and Duval counties as a whole (see Table 3-15).

3.7.2 Economy, Employment, and Income

The City of Jacksonville and its surrounding areas have a diversified economy which is strongly tied to the Navy and service industries. The Navy injects more than $1.69 billion into the Jacksonville economy through the payroll and procurement expenditures needed to operate NAS Jacksonville, NAS Cecil Field, NAS Mayport, and the Marine Corps' Blount Island Command. NAS Cecil Field is responsible for approximately $255.2 million of this total (Hollingsworth 1994).

Table 3-13

TOTAL POPULATION CHANGES FOR THE CITY OF JACKSONVILLE, NEARBY COUNTIES, JACKSONVILLE MSA, AND THE STATE OF FLORIDA (1980 to 1990)

Geographical Area	1980	1990	Percent Change
City of Jacksonville	540,920	635,230	17.4
Clay County	67,100	105,986	58.0
Duval County	571,000	672,971	17.9
Nassau County	32,900	43,941	33.6
St. Johns County	51,300	83,829	63.4
Jacksonville MSA	722,300	906,727	25.5
State of Florida	9,747,000	12,937,900	32.7

Key:

MSA = Metropolitan Statistical Area.

Source: U.S. Department of Commerce, Bureau of the Census 1992.

Table 3-14

POPULATION PROJECTIONS FOR THE JACKSONVILLE MSA, NEARBY COUNTIES, AND THE STATE OF FLORIDA FROM 1995 TO 2005

Geographical Area	1990 (actual)	April 1, 1995	2000	2005
Clay County	105,986	121,897	138,267	153,930
Duval County	672,971	713,743	751,466	786,964
Nassau County	43,941	48,662	53,016	57,129
St. Johns County	83,829	97,330	110,749	123,606
Jacksonville MSA	906,727	981,632	1,053,498	1,121,629
State of Florida	12,937,900	14,295,156	15,593,757	16,825,598

Source: Jacksonville Planning and Development Department 1994.

Key:

MSA = Metropolitan Statistical Area.

Table 3-15

DEMOGRAPHIC CHARACTERISTICS OF CLAY COUNTY, DUVAL COUNTY, AND ZIP CODE AREAS DIRECTLY ADJACENT TO NAS CECIL FIELD

Geographic Area	Total Population	Percent of Total Population					Total Hispanic Population[a]
		White	Black	Native American	Asian/ Pacific Islander	Other	
Clay County (total)	105,986	92.2	5.2	0.3	1.7	0.6	2,764
Zip Code 32068	23,157	95.5	2.7	0.4	0.9	0.5	468
Duval County (total)	672,971	72.8	24.3	0.3	1.9	0.7	17,333
Zip Code 32009	1,890	94.2	5.0	0.5	0.1	0.2	21
Zip Code 32210	54,546	82.2	13.3	0.4	3.1	1.1	1,834
Zip Code 32220	9,389	93.0	6.0	0.3	0.6	0.2	133
Zip Code 32221	18,243	84.9	10.5	0.5	2.7	1.3	682
Zip Code 32222	4,092	87.5	7.6	0.4	3.7	0.9	139
Zip Code 32234	5,830	89.9	9.0	0.4	0.5	0.2	56

[a] Hispanic residents may be within any of the racial groups.

Source: CACI Marketing Systems 1991; Grimm 1994b.

As discussed in Section 3.7.1, NAS Cecil Field employed 7,140 full-time and reserve military personnel, 813 civilians, and 342 contractors in FY 1995. The total annual payroll of the station is approximately $229.2 million. In addition to these expenses, NAS Cecil Field also injects income into the regional economy through spending on construction projects ($1.8 million), repair projects ($13.1 million), service projects ($5.6 million), and through the purchase of utilities ($5.5 million) (Hollingsworth 1994).

Service industries are also a significant force in the regional economy. In 1990 approximately 31.4% of all jobs in the region were in the service industry. Nine out of every 10 new jobs created in recent years have been in service industries, with nearly 25% of the new jobs created in the health or business service industries (University of Florida 1992; Florida Times-Union n.d.).

During 1990, retail and wholesale trade establishments were the next largest employment sector in the Jacksonville MSA after service industries, and provided 26.9% of the employed labor force with work. Financial, insurance, and real estate companies provided an additional 10.3% of the employed population with work, while manufacturing industries supplied 8.9% of the total jobs available in the region (University of Florida 1992).

The 10 largest private employers in Jacksonville MSA are all service-related industries. They include two retail grocery companies (Winn-Dixie Stores, Inc. and Publix Super Markets, Inc.); two banks (Barnett Banks, Inc. and First Union Bank of Florida); two insurance companies (Blue Cross and Blue Shield of Florida, Inc. and Prudential Insurance Co. of America); one utility company (AT&T); one medical facility (St. Vincent's Medical Center); and one transportation company (CSX Transportation, Inc.) (Florida Times-Union n.d.).

The Jacksonville MSA enjoys a relatively low level of unemployment. In 1993, the total non-agricultural labor force consisted of 474,345 persons. The 1993 average annual unemployment rate for the Jacksonville MSA was 5.33%. This figure compares favorably to 5.71% and 6.25% unemployment rates for 1993 in the State of Florida and the U.S., respectively (Florida Times-Union n.d.).

The Jacksonville MSA is slightly less affluent than the State of Florida or the U.S. In 1990 the average annual per capita income for the Metropolitan Statistical Area was $14,141 which is less than the $14,698 for the State of Florida and the $14,420 for the United States as a whole. Income is not evenly distributed through the Jacksonville area. The 1990 per capita income for St. Johns County ($17,113) was substantially greater than the 1990 per capita income for Clay County ($13,945), Duval County ($13,857), and Nassau County ($13,288) (see Table 3-16).

Table 3-16

PER CAPITA INCOME FOR THE JACKSONVILLE MSA, STATE OF FLORIDA, AND UNITED STATES

Geographical Area	1990 per Capita Income ($)
Clay County	13,945
Duval County	13,857
Nassau County	13,288
St. Johns County	17,113
Jacksonville MSA	14,141
State of Florida	14,698
United States	14,420

Key:

MSA = Metropolitan Statistical Area.

Source: U.S. Department of Commerce, Bureau of the Census 1992.

In addition, income within each county is not uniformly distributed. Table 3-17 presents the 1990 per capita income and the 1990 median household income for zip code areas that are directly adjacent to NAS Cecil Field. As shown on this table, income statistics vary substantially across each zip code area.

3.7.3 Taxes and Revenues

The City of Jacksonville is a consolidated city/county political entity that includes all of Duval County. When consolidation occurred on October 1, 1968, all existing municipalities and public agencies within Duval County, excluding the Duval County School Board, were merged into a single new corporate and political entity know as the City of Jacksonville (City of Jacksonville 1994).

The total annual budget of the City of Jacksonville for FY 1994-1995 was $900,816-,210, including miscellaneous federal programs. The largest expenditures of the 1994-1995 approved budget were for law enforcement, public utilities, administration and finance, and fire and rescue services. These activities were projected at 16.7%, 15.7%, 12.2%, and 7.3%, respectively of the total expenditures for FY 1994-1995 (City of Jacksonville 1994).

The largest single source of revenue for the City of Jacksonville is *ad valorem* taxes, which are levied on property located within Duval County. In FY 1994-1995, the total amount of *ad valorem* taxes was expected to reach approximately $216.8 million and comprise 24.0% of the total annual revenues raised by the city. In addition to the *ad valorem* taxes, charges for use of public services, such as solid waste disposal, water and sewer usage, and public parking were expected to generate more than $140.3 million or 15.6% of the total annual revenue; the 0.5-percent sales tax was expected to generate approximately $80.0 million (8.9% of the total annual revenue); and the utilities service taxes was expected to generate more than $60.1 million (6.7% of the total annual revenue). The remaining revenue is generated primarily from intergovernmental transfers, user charges, rents, licenses and permits, and fines and forfeitures (City of Jacksonville 1994).

In 1995, the total assessed value of taxable property in the City of Jacksonville was $20,201,997,000. The total millage rate for FY 1994-1995 was expected to be 11.3158 (City of Jacksonville 1994).

Clay County's total annual budget for FY 1994-1995 was $94,636,180, including fund transfers and surplus cash carried forward from previous years. The total projected revenues for FY 1994-1995 were $57,345,336. *Ad valorem* taxes were expected to account for approximately $24.1 million or 42% of the total revenues while intergovernmental transfers, other taxes (including a tax on gasoline), and charges for services are projected to

Table 3-17

INCOME CHARACTERISTICS OF ZIP CODE AREAS DIRECTLY ADJACENT TO NAS CECIL FIELD

Geographic Area	Average Per Capita Income ($)	Median Household Income ($)
Clay County		
Zip Code 32068	10,983	29,435
Duval County		
Zip Code 32009	12,406	31,864
Zip Code 32210	13,727	29,657
Zip Code 32220	9,533	24,451
Zip Code 32221	9,940	32,856
Zip Code 32222	10,002	23,489
Zip Code 32234	9,964	23,983

Note: County income statistics shown on previous tables are based on the 1990 United States Census of Population and Housing figures. Zip code area income statistics are based on a combination of census figures and Bureau of Economic Analysis figures. These figures may not be directly comparable.

Source: CACI Marketing Systems 1991.

account for 26.2%, 14.1%, and 12.9% of the total revenues, respectively. The remaining $2.7 million in revenue was expected to be raised from fines and forfeitures and other miscellaneous sources (Clay County Board of Commissioners 1995).

The total budgeted expenditures during FY 1994-1995 were expected to be more than $76.7 million. General administration and finance, public works, and law enforcement accounted for approximately 26.5%, 21.5%, and 19.9% of the total 1994-1995 budgeted expenditures for Clay County, respectively. Expenditures were also expected for environmental services; fire protection; parks and recreation; health, welfare, and housing programs; civil defense; court and attorney costs; agricultural assistance; and tourist development programs (Clay County Board of Commissioners 1995).

In FY 1994-1995, the total assessed value of property in Clay County was $2,771,291,726. This represents an increase of approximately 4.5% over the previous year's figure of $2,650,863,120. The total millage remained constant during these two years at 8.4585 (Clay County Board of Commissioners 1995).

3.7.4 Housing

During 1990 the individual counties in the Jacksonville MSA, with the exception of St. Johns County, experienced low homeowner vacancy rates with respect to the State of Florida as a whole. Homeowner vacancy rates ranged between 1.8% and 3.6% of the total owner-occupied units in the four counties. Conversely, rental vacancy rates were typically greater in the Jacksonville counties than in the state. Rental vacancy rates ranged between a low of 8.7% of the total rental units in Clay County to a high of 20.8% vacancy in the total rental units in Nassau County (see Table 3-18).

The 1990 median value of occupied housing units in the four counties varied substantially. Median housing values in St. Johns County ($85,800) and Clay County ($82,100) were greater than median value for all homes in the State of Florida ($77,100). By contrast, the median value of housing units in Duval County ($64,000) and Nassau County ($72,600) are significantly lower than the comparable figure for the state (see Table 3-18).

Corresponding to the high rental vacancy rates, median rental prices in the Jacksonville MSA were typically lower than in the state as a whole. Duval, Nassau, and St. Johns Counties all had median contract rents that were lower than the state's rate of $402. Median rental prices for Clay County were slightly greater than the state's rate at $404 (see Table 3-18).

The Navy provides bachelor and family housing for military personnel assigned to the NAS Cecil Field Complex. NAS Cecil Field contains 97 family housing units including 17

Table 3-18

HOUSING STATISTICS FOR CLAY, DUVAL, NASSAU, AND ST. JOHNS COUNTIES, AND THE STATE OF FLORIDA

	Total Number of Units	Homeowner Vacancy Rate	Rental Vacancy Rate	Median Value ($)	Median Contract Rent ($)
Clay County	40,249	2.6	8.7	82,100	404
Duval County	284,673	2.8	12.6	64,000	355
Nassau County	18,726	1.8	20.8	72,600	327
St. Johns County	40,712	3.6	19.2	85,800	394
State of Florida	6,100,262	3.4	12.4	77,100	402

Source: U.S. Department of Commerce, Bureau of the Census 1992.

two-bedroom units, 79 three-bedroom units, and one four-bedroom unit. In addition, a total of 200 family housing units are located at the Yellow Water Housing Area including 50 three-bedroom units and 150 four-bedroom units. Currently, all of the family housing units on-station are occupied and there is a waiting list of approximately 125 families (Pierce 1994). NAS Cecil Field also operates a 48-site trailer park where the Navy leases mobile home sites to personnel who own their own trailers. As of November 1994, all but two sites were occupied (Pierce 1994).

The Navy operates a total of 131 BOQ units at NAS Cecil Field, including 50 units for officers permanently stationed at NAS Cecil Field and 81 units for transient officers. The permanent BOQ units have a 58% utilization rate, while the transient BOQ units have a 63% utilization rate (Houston, S. 1994).

Similarly, the U.S. Navy maintains 21 separate BEQ Housing Barracks at NAS Cecil Field. The total housing capacity of these buildings is 2,218 personnel. As of November 1994, these units were operating at a 91% utilization rate (Pomper 1994).

3.7.5 Education

Most of the school-age children of Cecil Field military and civilian personnel attend public schools in Duval County and Clay County school districts.

School districts in Florida receive their operating funds from three major sources: the state government, local *ad valorem* property taxes, and the federal government. On average, the Florida Department of Education provides approximately 50% of each school district's operating funds, local funds comprise 42%, and the federal government provides 8% of district financial needs (Morris 1994).

A substantial portion of the financial assistance provided by the state is obtained from a 6% state sales tax. The total sales tax collected throughout the state is divided among all the school districts based on an "equal education affordability" formula. This formula considers the ability of each local community to provide the finances required to cover the standard cost of educating its students. The state allocates its funds to make up the balance of the cost requirements, in proportion to each district's needs. The intent of this system is to ensure that each school district has the financial ability to provide quality public education, regardless of the community's ability to fund it. The base student allocation (BSA), or the dollar amount allocated from state funds to each full-time student, is determined annually by the state legislature. In the 1994-95 school year, the BSA for grades 4 through 8 was $2,558.17. For grades K through 3 and grades 9 through 12, the BSA was slightly higher at approximately $2,632.36 and $3,095.39, respectively (Morris 1994). The BSA is the average

figure used as a starting point in the equal education affordability formula. Handicapped students are allocated slightly more state aid.

Local *ad valorem* taxes also provide a large portion of school district funding. In Duval County, school millage is levied by the school board, and limits are mandated annually by legislation. For example, in 1992, the school millage rate for all tax districts in Duval County was 9.8. In that year, one mill of tax dollars produced approximately $18 million; correspondingly, the school district received approximately $176.4 million dollars from 1992 *ad valorem* taxes (City of Jacksonville, Public Information Office n.d.)

The U.S. Department of Education Impact Aid Program provides financial assistance to public school districts for federally connected students, including children of NAS Cecil Field personnel. The program is designed to compensate school districts for the loss of the property tax due to the federal government's tax exempt status. Eligible students must have at least one parent employed by the federal government or reside on federal property such as a military installation, an Indian reservation, or low-income housing. Based on specific eligibility criteria, a certain amount of federal assistance is issued for each eligible student. There are two general categories of students: "A" students are those who both reside on federal property and have a parent employed on federal property (civilian) or have a parent on active duty in the "uniformed services" (military); "B" students are those students who meet only one of these criteria (U.S. Department of Education, Office of Impact Aid 1992). Table 3-19 presents the average daily attendance of all federally connected students and the corresponding federal impact aid received by public school districts in Duval and Clay counties. These totals include students affiliated with all military installations and federal activities in the area, including NAS Jacksonville, Mayport Naval Station, Blount Island, and NAS Cecil Field.

Duval County School District

In 1993-94, 212,500 students were enrolled in the 148 schools that comprise the Duval County School District. Approximately 12,000 faculty and staff are employed district-wide, and an average ratio of one teacher to every 27 primary grade students is maintained. To accommodate an average annual student growth rate of 2% to 3%, the district typically hires 60 to 120 new teachers per year (Jackson 1994). The Duval County School District has an operating budget of $542 million.

Of the 8,925 federally connected students in the district, it is estimated that 3,670 students are associated with NAS Cecil Field, based on figures supplied by the U.S. Department of Education and estimates made using a zip code residency distribution of Cecil Field

Table 3-19

AVERAGE DAILY SCHOOL ATTENDANCE OF FEDERALLY CONNECTED STUDENTS FROM ALL JACKSONVILLE AREA MILITARY INSTALLATIONS, AND FEDERAL IMPACT AID RECEIVED BY SCHOOL SYSTEMS IN THE STUDY AREA

	ADA of Federally Connected Students					
	Military "A"	Civilian "A"	Military "B"	Civilian "B"	Total ADA	Total Federal Impact Aid Received in FY 94
Duval County	1,750	0	5,342	1,833	8,925	$1,964,909
Clay County	0	0	3,104	1,309	4,413	$834,045
Total	1,750	0	8,446	3,142	13,338	$2,798,954

Key:

ADA = Average Daily School Attendance.
FY = Fiscal year.

Source: U.S. Department of Education 1994.

military and civilian personnel. In FY 1994, the district received $1,964,909 in Federal Impact Aid, an average of $900.43 per military "A" student, $61.13 per military "B" student, and $34.16 per civilian "B" student (U.S. Department of Education 1994). Of the total Federal Impact Aid received, approximately $613,706 was received for children of NAS Cecil Field personnel (see Table 3-20). In the 1994-95 school year, the Duval County School district received $411,585,302 in primary state aid, an average of approximately $1,936.40 per student (Morris 1994).

Clay County School District

As of November 1994, 23,906 students were enrolled in the Clay County School District's 26 schools (Smokes 1995). The operating budget of $106,304,078 supports 2,449 faculty and staff positions in the district. The average teacher-to-student ratio ranges from 1 to 24 for younger grades to 1 to 30 for grades 7 through 12. The district has experienced a 2.5% student growth rate annually over the past five years, and has increased its employee base by 307 positions during this time (Denton 1995).

According to the Clay County School District, 1,019 of the 4,413 federally connected students in the district are associated with NAS Cecil Field (Smokes 1995). In fiscal year 1994, the district received $834,045 in Federal Impact Aid, with payments averaging $211.82 for each military "B" student and $134.89 for each civilian "B" student (U.S. Department of Education 1994). There were no "A" students in the Clay County School District. Of the total Federal Impact Aid received, approximately $206,690 was received for children of Cecil Field personnel (see Table 3-20). During the 1994-95 school year, the district received primary state aid totalling $79,119,864, an average of approximately $3,310 per student (Morris 1994).

3.7.6 Community Services

3.7.6.1 Security

NAS Cecil Field

Security, law enforcement, and traffic control services at the station are provided by the NAS Cecil Field Security Department based in Building 327 at the Main Gate. The 80 to 100 security personnel in the department are primarily military personnel, except for four civilians. In addition, an auxiliary force of 100 to 150 is available for emergencies and special events that require increased security (Morrison 1994).

Table 3-20

PUBLIC SCHOOL DISTRICT DISTRIBUTION OF CHILDREN OF NAS CECIL FIELD PERSONNEL AND FEDERAL IMPACT AID GENERATED

	Duval County		Clay County	
	Military	Civilian	Military	Civilian
Number of students from NAS Cecil Field families	3,107	563	900	119
Total students enrolled in school district[a]		212,500[b]		23,906[c]
Estimated federal impact aid generated by NAS Cecil Field students (subtotal)	$594,474	$19,232	$190,638	$16,052
Estimated federal impact aid generated by NAS Cecil Field students (total)		$613,706		$206,690

[a] Estimated from Zip Code District and Family Housing.
[b] 1993-1994.
[c] 1994-1995.

Source: U.S. Department of Education 1994; Smokes 1995; Zip code residency distribution of Cecil Field personnel 1994.

The department provides roving patrol, traffic control, and response services throughout the base and the Yellow Water Housing Area. The department is responsible for patrol at the two main gates and check-in/issuance of access passes, in addition to security officer training and department administration. The department receives 30 to 40 security calls during daytime hours, a significant portion of which involve domestic and neighbor disputes in the housing areas (Morrison 1994).

Although the department does not have a formal mutual aid agreement with the surrounding City of Jacksonville Police Department, mutual assistance is provided when requested. Requests for assistance from the city or NAS Cecil Field have been rare (Morrison 1994).

City of Jacksonville

The Office of the Sheriff, Jacksonville Police Department is a consolidated county/city department whose service area includes the entire 840 square miles that comprise Duval County. Although four independent municipalities within the county (including Baldwin, Neptune Beach, Atlantic Beach, and Jacksonville Beach) fund and operate separate police departments that respond to small crimes and perform traffic control activities, the Jacksonville Sheriff's Office continues to provide security services in these areas for the larger, more serious law enforcement situations.

There are 1,300 uniformed personnel in the department, and all officers are based in the department's main station in downtown Jacksonville. In 1993, 701,135 calls for service were received. Of these calls, 413,669 (59%) required officers to be dispatched to the scene to respond to a violent crime or burglary in progress (Vanderhoff 1995).

The level of security service in a given area is commonly expressed as a ratio of officers to each 1,000 in residential population. For the Jacksonville Police Department, the ratio is approximately 1.85 officers per 1,000 residents. This is lower than the state average of 2 or more officers per 1,000 residents (Vanderhoff 1994).

The Office of the Sheriff, Jacksonville Police Department has mutual aid agreements with all of the surrounding counties and municipalities. Requests for assistance are received periodically, and often involve the use of the department's helicopters.

3.7.6.2 Fire Protection

NAS Cecil Field

Two fire stations are located at NAS Cecil Field. One is located at the Main Station (Building 9), and one specialized "crash station" is located in the main flight line area. These stations provide first response services for all on-base fire and plane crash emergencies. The department coordinates with the NAS Cecil Field Medical Clinic, which provides emergency medical services.

Sixty of the 61 firefighters in the NAS Cecil Field Fire Department are civilians, in addition to the chief and assistant chief. The 24-hour shift rotations ensure that 23 firefighters are on duty at all times (Moneyhan 1994).

Equipment used by the department includes three trucks capable of pumping 1,000 gpm, two trucks capable of pumping 250 gpm, seven trucks specifically designed for crash response, one crane, one water tanker, and one vacuum truck for spill response. In addition, the department maintains and uses nine sport/utility vehicles (Moneyhan 1994).

The NAS Cecil Field Fire Department's response times are equal to or faster than those required for Navy facilities under the Naval Shore Establishment Fire Protection/Prevention Program (Moneyhan 1994). This program requires response times of 3 minutes for plane crashes, 5 minutes for other airfield emergencies, and crane response to the airfield within 15 minutes. For structural fire emergencies, the first fire-fighting vehicle responds within 6 minutes for fire emergencies located within 3 miles, and 8.5 minutes for fires within 5 miles (Navy 1989).

City of Jacksonville

The City of Jacksonville Fire and Rescue Department provides fire protection and emergency rescue services for most of Duval County. The department operates 50 fire stations located throughout its service area, which includes all of Duval County except Jacksonville Beach and Atlantic Beach. The closest station to NAS Cecil Field is Station 31, which is located on Wilson Boulevard.

The 900 uniformed fire fighters in the department respond to approximately 100,000 fire and emergency rescue calls annually. Included in this total are the responses associated with the department's mutual aid agreements with NAS Cecil Field and all of the surrounding counties and municipalities. The City of Jacksonville receives calls for assistance from NAS Cecil Field infrequently (Lindsay 1994).

The fire and rescue department performs its duties using 47 fire engines with pumping capacities greater than 150 gpm, seven ladder trucks for multi-story building fires, 12 pumpers with water tank reserves, six "woods trucks" with four-wheel drive capabilities to fight forest fires, and 19 medical rescue units. Response times maintained by the department average 5.5 minutes for fire fighting first response, and 6.5 minutes for rescue units (Lindsay 1994).

3.7.6.3 Medical Services

NAS Cecil Field

Medical services available at NAS Cecil Field are provided by the Cecil Field Medical Clinic and Dental Clinic. Both will cease operations with the closure of NAS Cecil Field.

The Medical Clinic, located in Building 808, provides urgent (emergency) care, military sick call, primary care for dependents of military personnel, occupational health services, and some types of minor surgery. An in-house pharmacy and analytical laboratory further increase the clinic's level of self-sufficiency. In addition, the medical clinic operates an ambulance and emergency medical response team for on-base emergencies. There are no overnight in-patient facilities. Active-duty station personnel and their dependents are eligible to use the medical clinic; retirees go to the Naval Hospital in Jacksonville for medical needs.

The clinic employs 177 medical and support personnel. Of these, 80% are military and 20% are civilian personnel. On average, 3,000 to 3,500 patients are treated per month, but the clinic has successfully treated as many as 4,000 patients in a month (Dowling 1994).

Patients with special medical problems or severe injuries are referred to the Naval Hospital in Jacksonville or any of the several local hospitals.

The Cecil Field Dental Clinic provides general dental and dental surgery services, including endo- (root canal surgery) and perio- (gum disease surgery) dentistry, and prosthetics (replacement of teeth) services. The clinic serves primarily active-duty personnel, but also serves dependents of active-duty personnel in emergencies.

Approximately 80% of the clinic's 32 dental and support employees are military personnel, and approximately six are civilian employees. The medical staff consists of eight dentists and 16 dental technicians. The dental clinic serves an average of 98 to 150 patients per day (Gardner 1995).

City of Jacksonville

The City of Jacksonville offers complete, specialized, and diverse health care resources, including 11 hospitals, more than 2,300 physicians, and almost 500 dentists. In addition, nine publicly funded medical clinics are operated by the Duval County Health Department. The Mayo Clinic, Nemours Children's Clinic, and many of the other hospitals offer several highly specialized services with excellent regional and national reputations. In addition, Jacksonville has one of only four Level I trauma centers in Florida, and a branch of the Boston-based Joslin Diabetes Clinic (Jacksonville Chamber of Commerce 1993).

3.7.6.4 Recreational Facilities

NAS Cecil Field

The Morale, Welfare, and Recreation (MWR) Department at NAS Cecil Field provides a wide range of athletic and recreational services and facilities to military personnel and their dependents. On-base recreational facilities include athletic fields, tennis courts, basketball courts, a skeet range, a bowling alley, a golf course, a marina, swimming pools, picnic areas, the Lake Fretwell Recreation Area, a library, a gymnasium, and an automotive hobby shop.

City of Jacksonville

More than 2,012 acres of park land are dedicated to active and passive public recreation in the City of Jacksonville. An additional 1,451 acres of pastoral open space are owned by the city, and nearly 2,015 acres of land are privately owned and operated as recreational facilities which are open to the general public (Jacksonville Planning and Development Department 1990).

3.8 Transportation

3.8.1 Road Network

Regional and Local Road Network

NAS Cecil Field is served by a system of roads that are part of a regional and interstate system providing access to the State of Florida and the southeastern United States. Figure 3-12 presents the following major components of this road network (Jacksonville MPO 1994):

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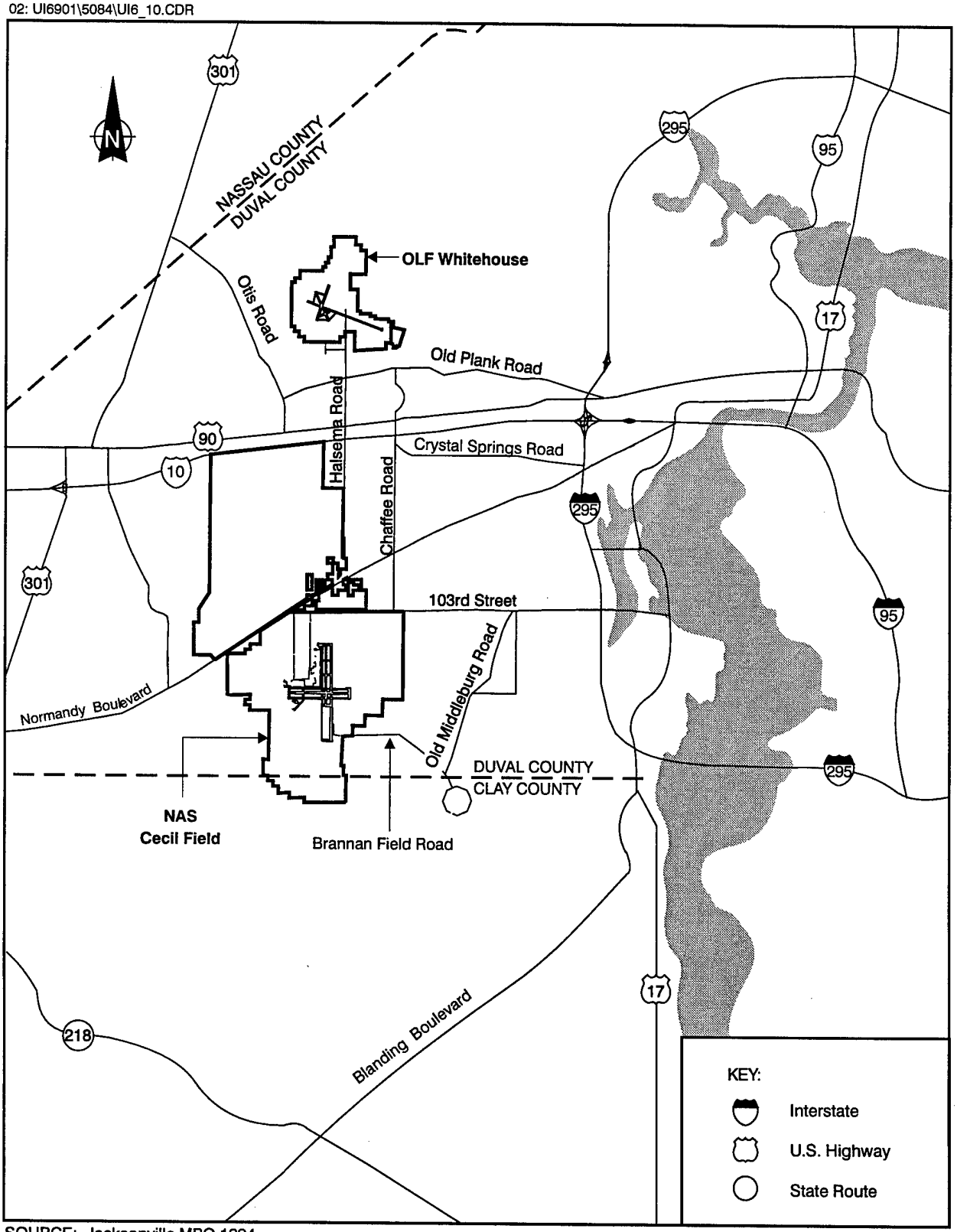

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 3-12 ROAD SYSTEM IN THE VICINITY OF NAS CECIL FIELD

- Interstate 10 (I-10) is a limited access freeway that traverses the State of Florida and the nation from east to west, and connects to the major north/south connectors in the state, Interstate 75 (I-75) to the west, and Interstate 295/95 (I-295/95) to the east;

- Interstate 295 (I-295) is a limited access freeway that bypasses the western periphery of downtown Jacksonville and connects to I-95 to the north and south of the urbanized area of the city;

- U.S. 301 (Baldwin-Marville Road) is a principal arterial that runs from north to south through the City of Baldwin, west of the station;

- U.S. 90 (Beaver Street West) is a principal arterial that runs parallel to I-10 and provides access to downtown Jacksonville to the east and cities of the Florida panhandle to the west; and

- Florida SR 218 (Normandy Road) is a principal arterial that bisects the main base and provides access from the southwest to the high-intensity development to the east.

The system of local roads adjacent to NAS Cecil Field serves traffic attracted to and generated from the base and neighboring land uses (Jacksonville MPO 1994).

The following roads are included in the local system:

- 103rd Street is a minor arterial road that connects the two primary gates of the NAS to the higher density development to the east;

- Chaffee Road is a minor arterial road that provides access from 103rd Street north to I-10;

- Blanding Boulevard is a minor arterial that serves as a primary connection between Clay County and the developed areas east of the station;

- Crystal Springs Road is a collector road that provides access to the east from Chaffee Road;

- Old Middleburg Road is a collector road that provides access into Clay County from 103rd Street; and

- Otis Road is a collector road that provides access to Nassau County from U.S. 90.

NAS Cecil Field is served by a network of internal paved and unpaved roads totalling approximately 137 miles. "D" Avenue and "A" Avenue are the primary north-south circulation routes to and from the Main Station (Navy 1988). The main gate is located at the intersection of "D" Avenue, 103rd Street, and Normandy Boulevard, and it is utilized by

commercial and visitor vehicles. The eastern gate (i.e., "A" Gate), located at the intersection of 103rd Street and "A" Avenue, is a secondary gate for vehicles with preapproved security clearance. The primary east-west collector roads are 9th Street, 6th Street, 4th Street, and 2nd Street.

Secondary roads provide access to runways, recreational areas, and the more remote areas of the station (Navy 1988). The principal parking areas for the station are located in the vicinity of the developed areas of the Main Station, totalling approximately 450,000 square yards. Figure 3-13 depicts the internal (on-station) transportation network for Main Station and Yellow Water Area.

Pre-Closure Traffic Volumes

On-station vehicular activities are composed of commuter, visitor, operational, and commercial traffic. In general, the roadways serving the air station exhibit adequate capacity. Traffic volumes on regional and local roads in the vicinity of NAS Cecil Field vary based upon the influence of surrounding land uses.

Existing traffic volumes are measured by Average Daily Trip (ADT) and peak-hour traffic figures. ADTs reflect the total daily traffic movements, in both directions, averaged over a given year. Peak-hour counts reflect the number of vehicular movements on a road during the average morning or evening peak-hour period.

The capacity of a road indicates the ability of the network to serve the demand and volume of traffic on a specific segment, affected by its physical characteristics such as number of lanes, roadway width, intersection control, and distance between intersections. The level of service (LOS) is a qualitative measure of capacity which indicates the characteristics of a roadway by assigning a letter "A" through "F" to describe its operating capacity. The LOS characterizes road capacity in terms of traffic interruptions, freedom to maneuver, driver comfort/convenience, travel times, and vehicle speeds (Jacksonville MPO 1994). An LOS of "A" indicates a free-flow condition, or more than adequate capacity for the traffic volumes experienced. Conversely, an LOS of "F" on a roadway indicates low vehicle speeds, intersection congestion, and significant queuing (i.e., stacking) of vehicles.

The ADTs and LOSs for the roads surrounding NAS Cecil Field are presented in Table 3-21 and displayed on Figure 3-14. In general, few congestion problems occur during peak-hour traffic periods in this area. Most roadways are operating at an LOS of C or better. Normandy Boulevard and 103rd Streets, the primary access roads to NAS Cecil Field, operate at a LOS of B or better (Jacksonville MPO 1994).

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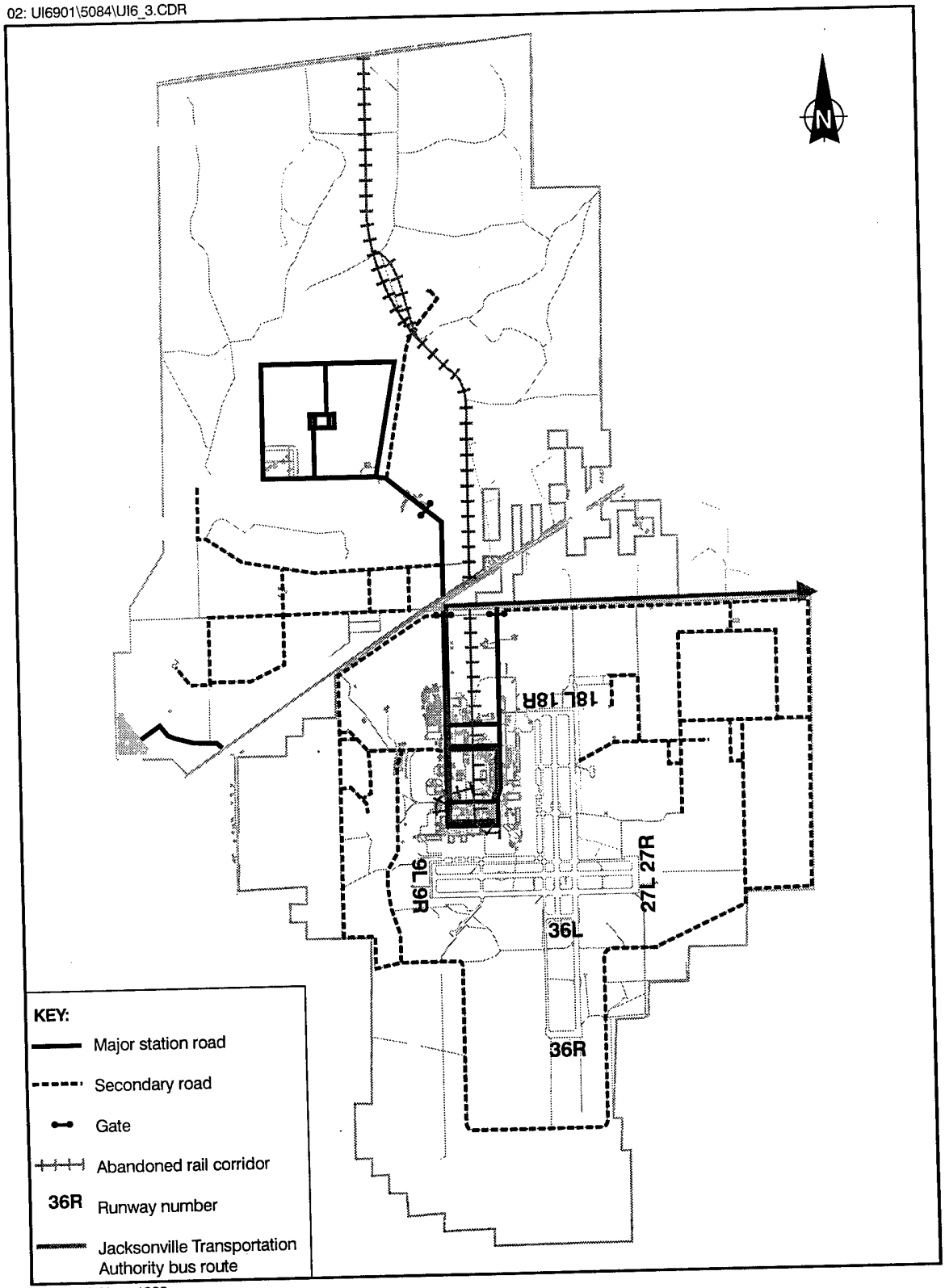

SOURCE: Navy 1988

SCALE
0 3,500 7,000 Feet

Figure 3-13 ON-STATION TRANSPORTATION NETWORK

Table 3-21

ROADWAY CHARACTERISTICS AND PRE-CLOSURE TRAFFIC VOLUMES

Road Name	Segment	Number of Lanes	1993 ADTs[a]	P.M. Peak Hour Vehicle Volume and Reserve Volume[b]	Roadway Type	LOS[c]
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	2	7,100	259	Principal arterial	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	2	7,000[g]	637[g]	Principal arterial	B
Beaver Street West	Chaffee Road - I-295	2	5,400	624	Principal arterial	B
I-10	US 301 - CSX Railroad	4	18,115[d]	2,960	Freeway	A
I-10	CSX - I-295	4	30,000[e]	3,827	Freeway	B
Normandy Boulevard	US 301 - 103rd Street	2	4,400	422	Principal arterial	B
Normandy Boulevard	103rd Street - Chaffee Road	4	10,100	970	Principal arterial	B
Normandy Boulevard	Chaffee Road - Herlong Road	4	9,000[g]	1,037[g]	Principal arterial	B
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	4	9,500	1,280	Minor arterial	B
103rd Street (SR 134)	Old Middleburg Road - I-295	6	39,000[g]	3,549[g]	Minor arterial	B
Chaffee Road	Normandy Boulevard - 103rd Street	4	NA	580	Principal arterial	C
Chaffee Road	I-10 - Normandy Boulevard	2	6,800	696	Minor arterial	C
Chaffee Road	Beaver Street - I-10	2	9,520[d]	958	Minor arterial	C
Yellow Water Road	Normandy Boulevard - Beaver Street	2	1,662	116	Collector	C
Otis Road	Nassau County Line - 103rd Street	2	2,000	166	Collector	C
Old Plank Road	Otis Road - Jones Road	2	1,728	199	Collector	C
Halsema Road	South of Whitehouse - Beaver Street	2	1,981	182	Collector	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	2	2,929	624	Collector	C
Old Middleburg Road	Clay County Line - 103rd Street	2	3,301	312	Collector	C
Blanding Boulevard (SR 21)	Clay County Line - I-295	6	78,000[g]	6,864[g]	Minor arterial	F
Blanding Boulevard	Wells Road - Duval County Line	6	78,000[g]	6,664[g]	Minor arterial	F

Table 3-21

ROADWAY CHARACTERISTICS AND PRE-CLOSURE TRAFFIC VOLUMES

Road Name	Segment	Number of Lanes	1993 ADTs[a]	P.M. Peak Hour Vehicle Volume and Reserve Volume[b]	Roadway Type	LOS[c]
Blanding Boulevard	College Drive - Kingsby	4	76,915[f]	2,028	Minor arterial	F
Wells Road	Blanding Boulevard - DeBarry Avenue	4	18,036	941	Minor arterial	C
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	2	23,278[f]	969	Minor arterial	F
College Drive (SR 224)	Blanding Boulevard - Remington Court	2	13,138	430	Minor collector	D
College Drive	Remington Court - Bald Eagle Road	2	—	355	Minor collector	C
I-295	SR 13 - SR 15	8	74,500[g]	6,851[g]	Freeway	C
I-295	SR 15 - SR 21	6	64,000[g]	5,888[g]	Freeway	C
I-295	SR 21 - SR 134	6	65,000[g]	5,980[g]	Freeway	C
I-295	SR 134 - SR 228	6	66,250[g]	6,095[g]	Freeway	C
I-295	SR 228 - I-10	6	71,500[g]	6,578[g]	Freeway	C
I-295	I-10 - SR 15	4	40,017[g]	3,682[g]	Freeway	C
I-295	SR 15 - SR 104	4	32,500[g]	2,990[g]	Freeway	C
I-295	SR 15 - SR 115	4	25,500[g]	2,346[g]	Freeway	B
I-295	SR115 - I-95	4	30,000[g]	2,760[g]	Freeway	B
Roosevelt Blvd. (US 17)	Clay County Line - SR 134	6	42,750[g]	3,890[g]	Principal arterial	C
US 301 S	Clay County Line - SR 228	4	16,900[g]	1,572[g]	Principal arterial	B
US 301 S	SR 228 - I-10	4	12,900[g]	1,200[g]	Principal arterial	B
US 301 S	I-10 - US 90	4	7,900[g]	719[g]	Principal arterial	B
US 301 Connector	E US 90 - W US 90	2	9,800[g]	892[g]	Principal arterial	B
N US 301	US 90 - N. Baldwin City Limits	2	5,200[g]	473[g]	Principal arterial	B
N US 301	N. Baldwin City Limits Nassau County Line	2	3,400[g]	316[g]	Principal arterial	B
US 17	Clay County Line - Wells Road	6	61,500[g]	5,904[g]	Principal arterial	C
US 17	Wells Road - SR 224	6	48,500[g]	4,656[g]	Principal arterial	D

Table 3-21

ROADWAY CHARACTERISTICS AND PRE-CLOSURE TRAFFIC VOLUMES

Road Name	Segment	Number of Lanes	1993 ADTs[a]	P.M. Peak Hour Vehicle Volume and Reserve Volume[b]	Roadway Type	LOS[c]
US 17	SR 224 - Holly Point Road	6	36,000[g]	3,456[g]	Principal arterial	B
US 17 Bridge	Doctors Inlet Bridge	4	36,000[g]	3,456[g]	Principal arterial	F

a Average daily traffic.
b Reserve volume is projected new traffic from approved, but not yet constructed, development projects.
c LOS is based on Florida's level of service standards (FDOT 1995).
d 1989 count.
e 1991 count.
f 1992 count.
g 1994 count (source FDOT 1995).

Key:

ADTs = Average Daily Trips.
LOS = Level of service.
SR = State road.

Source: Jacksonville MPO 1994.

Few road segments in the vicinity of the station experience congestion problems. Blanding Boulevard, which is designated as a minor arterial, acts as an important connection from development in Southern Duval and Clay County to the Southeast. This road operates at a LOS of F near the county line.

The internal road network of NAS Cecil Field experiences virtually no serious incidences of traffic congestion, and there are no problem areas on base; consequently, no capital improvements have been planned for the on-base roads (Morrison 1994). In the past, the entrances experienced periods of congestion during the morning peak-hour; however, this situation has been remedied by making the "A" Gate a one-way entrance during rush hour periods. Traffic exiting the station is dispersed throughout the day; consequently, no evening peak-hour congestion problems were experienced (Morrison 1994).

Traffic counts conducted by the NAS Cecil Field security department on April 23, 1987, between the hours of 0530 and 1800 revealed that inbound traffic through "D" Avenue was 3,957 vehicles, and inbound traffic on "A" Avenue was 3,132 vehicles (Navy 1988). Because the majority of trips to the station involve daily commuting, outbound trips generally equal inbound trips (Taylor 1997). In 1987, total trips at the "D" Avenue entrance was 7,914, while the "A" Avenue entrance experienced 6,264 total trips, or a total of 14,178 trips in and out of the station. This figure would be most representative of pre-closure traffic at NAS Cecil Field (Taylor 1997). As a result of gradual reductions in activities at the station associated with its pending closure, official estimates of total inbound and outbound traffic are approximately 12,000 vehicles per day (Taylor 1997).

Post-Closure Traffic

Traffic volumes on the roads on and around NAS Cecil Field would experience a reduction in trips as military and civilian personnel and their families would be transferred from the station after closure (NAS Cecil Field 1994a). This shift would result primarily in the reduction of traffic on roads in the immediate vicinity of the base because they carry the greatest percentage of trips generated from and attracted to station activities.

An analysis of the residential location of NAS Cecil Field employees (see Section 3.7) reveals the highest percentage of personnel is located in the 32073, 32210, 32215 and 32244 zip codes (see Figure 3-15). These zip code areas include the residential area close to the station (Grimm 1994a).

The 32210 zip code, which includes Herlong airport, has the highest percentage of residence by NAS Cecil Field personnel. The main road accessing this area from the station

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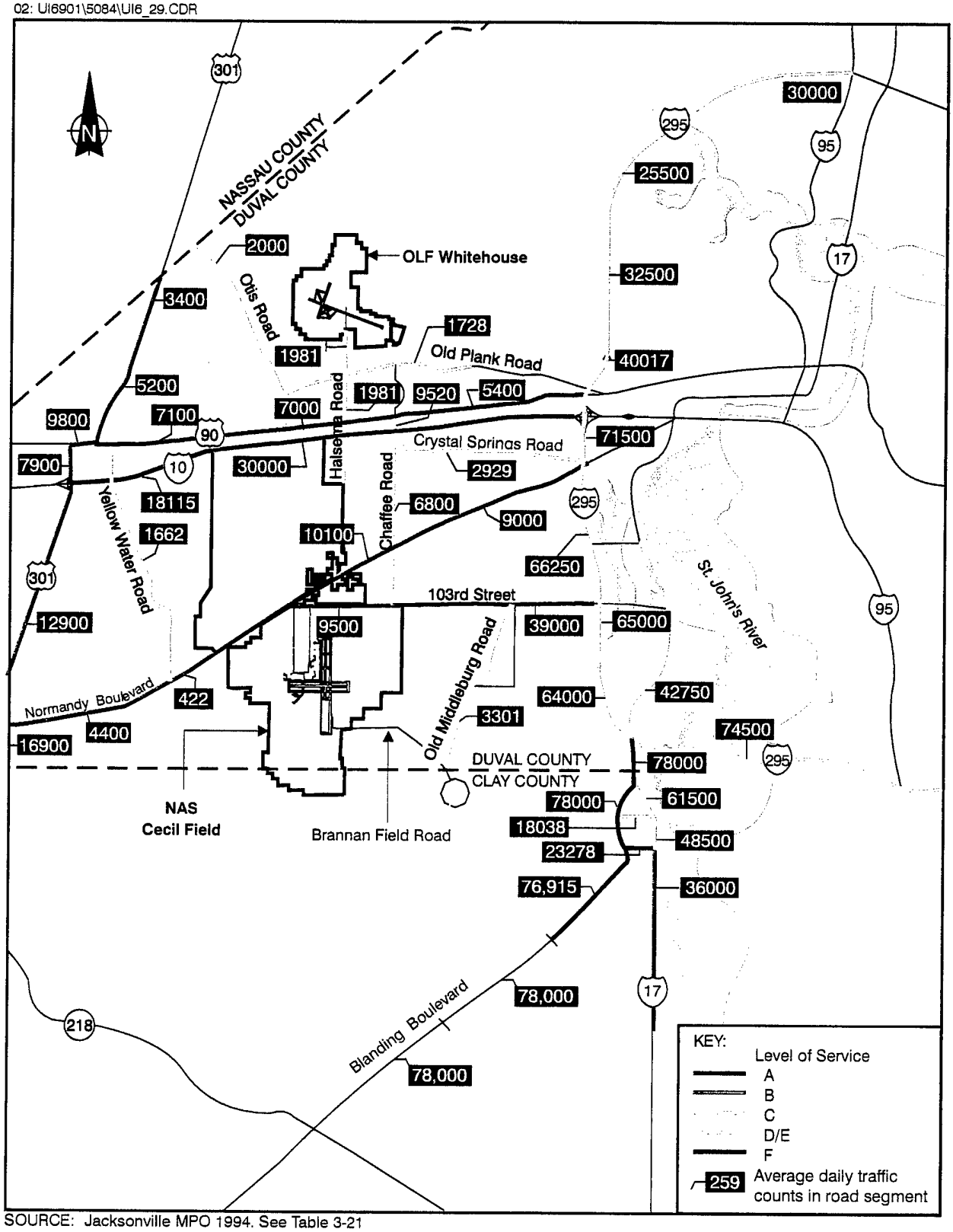

SOURCE: Jacksonville MPO 1994. See Table 3-21

SCALE
0 18,500 37,000 Feet

Figure 3-14 TRAFFIC CONDITIONS FOR ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD

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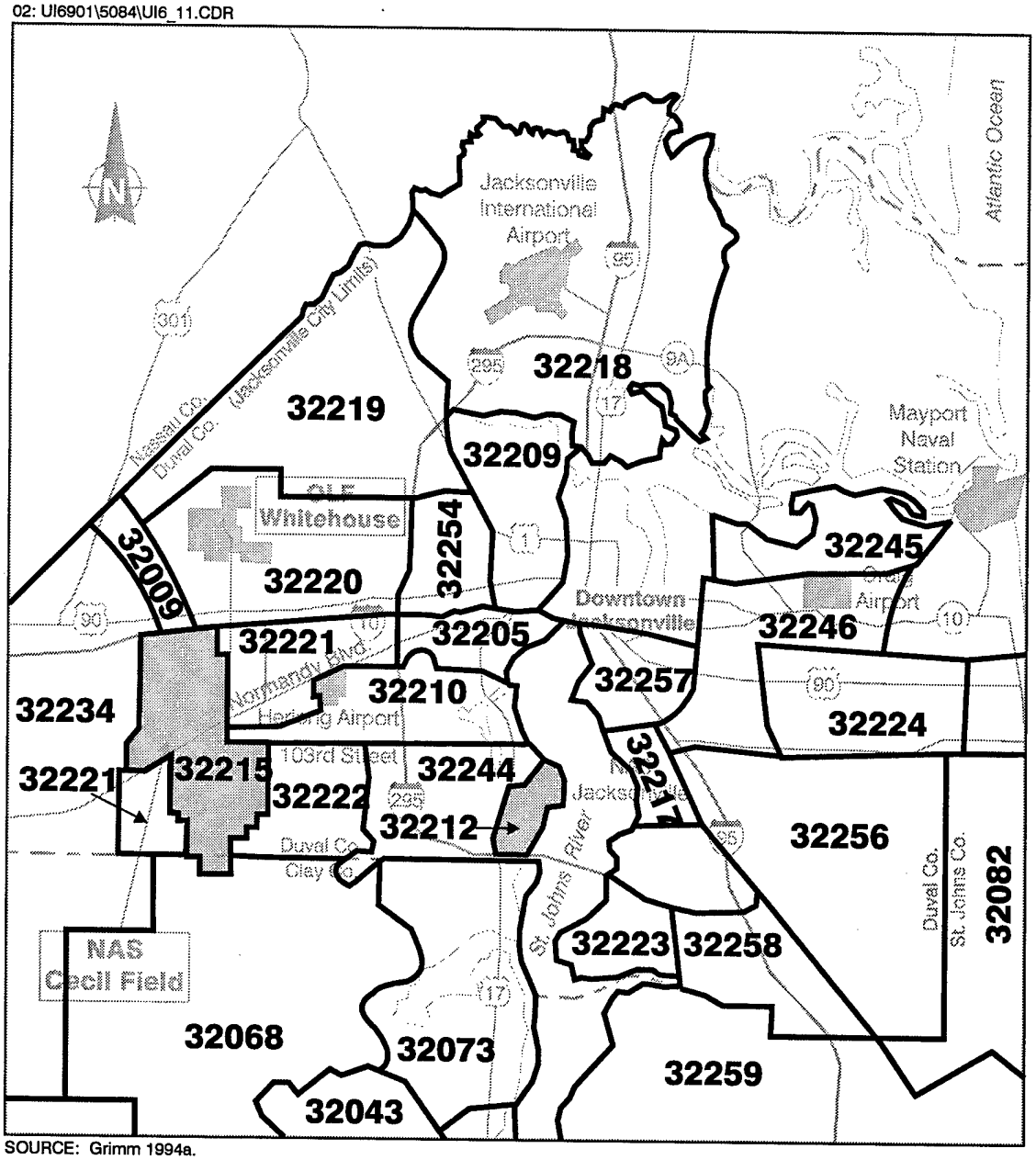

SOURCE: Grimm 1994a.

SCALE
0 12.3 24.6 Miles

Figure 3-15 ZIP CODE AREAS IN THE VICINITY OF NAS CECIL FIELD

is 103rd Street. In turn, residents in the 32244 zip code, located to the north of Orange Park also would use 103rd Street. Following closure, a reduction of traffic volume can be expected on this road.

The 32215 zip code coincides with the Main Station and Yellow Water Area boundaries. Roadways such as Normandy Boulevard and 103rd Street would experience decreases in traffic volume following base closure as local trips are eliminated to and from the station.

The 32073 zip code, located within in Orange Park and south of the city limits of Jacksonville, is a popular suburban area of the Jacksonville metropolitan area. Closure of NAS Cecil Field would eliminate trips between residents of this zip code and NAS Cecil Field to impact traffic volumes on Blanding Boulevard (now operating at a highly congested LOS), I-295, 103rd Street, as well as local roads west of Blanding Boulevard.

Planned Regional Road Improvements

As part of the City of Jacksonville's capital improvement process, several roads surrounding NAS Cecil Field are planned to undergo expansion in the future and new road construction is also proposed. Chaffee Road is proposed for extension to the southeast, through the northeast corner of the base, across Brannan Field Road, and into Clay County to connect with Blanding Boulevard. This would relieve the existing pressure on Blanding Boulevard and improve LOSs to concurrent levels and allow the proposed/approved development in this area to continue. Table 3-22 presents planned and programmed road improvements in the vicinity of the station.

3.8.2 Mass Transit

Mass transit service in the Jacksonville area is operated by the Jacksonville Transportation Authority (JTA). This service provides transportation throughout the metropolitan area using local, express, and handicapped buses (Navy 1988).

JTA provides service to NAS Cecil Field at the western service boundary of the Jacksonville metropolitan area. JTA Route WS6X-Cecil Field serves the station, arriving three times a day through the main gate and circulating to stops located throughout the station (Jacksonville MPO 1994). Civilian and military personnel utilizing this service can transfer to routes that access the eastern, northern, and southern portions of the metropolitan area. Figure 3-13 shows the existing transit route to NAS Cecil Field (Jacksonville MPO 1994).

Table 3-22

PLANNED AND PROGRAMMED ROADWAY IMPROVEMENTS FOR FISCAL YEARS 1995 AND 2010

Link to be Improved	Segment	Improvement	Year	Agency
FY 1995 Roadway Network				
Brannan Field-Chaffee Road	Clay County to I-10	New 4-lane divided	TIP	FDOT
Collins Road	Rampart Road to Blanding Boulevard	Widen to 3 lanes	FY 95/96	City
Fouraker Road	Old Middleburg Road to Normandy Boulevard	Widen to 3 lanes	TIP	City
James Road	San Juan Avenue to Wilson Boulevard	Widen to 3 lanes	FY 95	City
Old Middleburg Road	Wilson Boulevard to 103rd Street	Widen to 4 lanes	TIP	City
Old Middleburg Road	Herlong Road to Wilson Boulevard	Widen to 3 lanes	FY 95/96	City
Rampart Road	Collins Road to Morse Road	Widen to 4 lanes	FY 95	City
Wilson Boulevard	Fouraker Road to Old Middleburg Road	Widen to 3 lanes	FY 95/96	City
FY 2010 Roadway Network				
103rd Street	I-295 to Shindler Drive	Widen to 8 lanes	[a]	[a]
Normandy Boulevard	I-295 to 103rd Street	Widen to 6 lanes	[a]	[a]
Ricker Road	Old Middleburg Road	Widen to 3 lanes	[a]	[a]
Shindler Drive	Collins Road to 103rd Street	Widen to 3 lanes	[a]	[a]

[a] These are projected improvements for which programming has not yet been established.

Key:

FDOT = Florida Department of Transportation.
FY = Fiscal year.
TIP = Within the five-year time frame of the County Transportation Improvement Plan.

Source: Jacksonville MPO 1994.

3.8.3 Rail Facilities

Three major rail carriers operate in the Jacksonville area: CSX Transportation, Norfolk Southern Corporation, and Florida East Coast Railway (FEC). These rail carriers offer 34 trains a day to and from Jacksonville (Jaxport 1994a). CSX owns most of the rail systems in Jacksonville, and all of the lines in western Jacksonville. They move large volumes of freight such as nonmetallic minerals, chemicals, and allied products. In addition, CSX is Florida's only rail system that moves coal (Jacksonville Planning and Development Department 1990).

FEC is the only other Class I rail operator with lines in Jacksonville. It hauls enough nonmetallic minerals and dry and liquid bulk commodities to make it the second largest operator in Jacksonville (Jacksonville Planning and Development Department 1990).

The only active rail corridor in the vicinity of NAS Cecil Field is located parallel to I-10 and U.S. 90 and owned by CSX Transportation (Jacksonville Planning and Development Department 1990). These lines are also used by Amtrak, a passenger service, to connect service from Jacksonville with a CSX corridor that runs adjacent to U.S. 301 to the south (Jacksonville Planning and Development Department 1985).

The CSX Railroad had maintained operations into NAS Cecil Field until the early 1980s. This service involved the use of light rails, which are designed for slower train speeds than freight-designated rail lines. All operation and maintenance activities were terminated to reduce maintenance costs for rails that were no longer being used (Hale 1994).

3.8.4 Airport Facilities

The Jacksonville area has developed as a center for various forms of air transportation. It has a major commercial passenger airport, two general aviation airports and five military-related aviation facilities. As part of this network, NAS Cecil Field is an installation specifically designed for the operations of military jet aircraft. The station has four active runways at the Main Station (see Figure 3-13). The size of these facilities are as follows:

- Runway 18R/36L (200 feet by 8,000 feet);
- Runway 18L/36R (200 feet by 12,500 feet);
- Runway 9L/27R (200 feet by 8,000 feet); and
- Runway 9R/27L (200 feet by 8,000 feet).

In addition, NAS Cecil Field operates OLF Whitehouse, located north of the station, which has one runway and supports various training operations conducted by Navy aircraft.

Existing operations at NAS Cecil Field consist of sorties for training maneuvers and missions. Several types of aircraft are used during these operations including one C-12, four T-34s, 181 F/A-18 Hornets, and 52 S-3 Vikings. The number of F/A-18s and S-3s comprise two squadrons which are deployed in an active force at a given time. The aircraft cumulatively participated in approximately 175,168 operations (landing/takeoff cycles [LTOs]) at NAS Cecil Field in 1993 (see Table 3-5).

The facility has numerous structures designed for aviation support activities. There are eight hangars totalling 26 modules; the average module is 20,000 square feet of hangar bay. The maintenance area averages 10,000 square feet (NAS Cecil Field 1994).

In addition to the air facilities on the Main Station, several civilian and military airfields are located in the vicinity of NAS Cecil Field. Civilian airfields include Craig Airport, Herlong Airport, and Jacksonville International Airport (JIA). Military installations in the Jacksonville area include Mayport Naval Station and NAS Jacksonville, as well as operations of the Florida Air National Guard based out of JIA, and the Florida Army National Guard based at Craig Airport (see Figure 3-16). A brief description of each of these facilities follows:

- Craig Airport, located on Jacksonville's southside, has two active runways utilized by a number of corporate aircraft, private air taxis, and charter companies, as well as the Sheriff's helicopter unit (Jacksonville Planning and Development Department 1985). In addition, the Florida Army National Guard operates out of this facility, supporting training for Apache helicopter, utility helicopter, and air ambulance units.

- Herlong Airport, located on the city's west side, primarily serves recreational users (ultralights, gliders, hobby pilots), many of which are based at the airport (Jacksonville Planning and Development Department 1985).

- JIA, located in the northern part of the city just south of the Nassau county line, is the major civilian passenger and cargo airport in the region. Activities include domestic and international air carrier operations, military activities, air taxi operations, and general aviation flights (JAXPORT 1994a). In addition, the Florida Army National Guard operates out of JIA, conducting training for the 125th F-15 Fighter Group.

- Mayport Naval Station, located at the mouth of the St. Johns River, supports the Helicopter Wing One and is responsible for five

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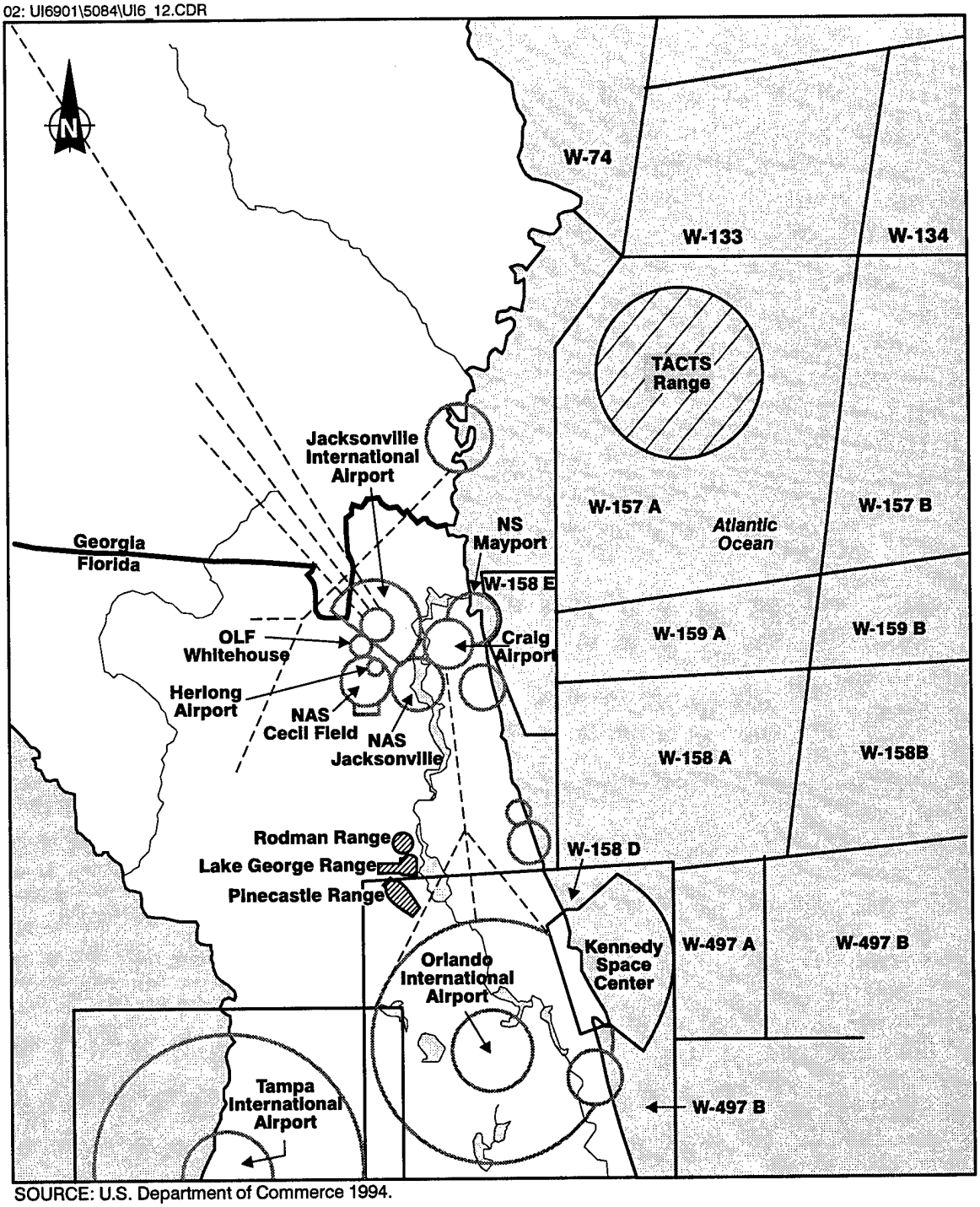

SOURCE: U.S. Department of Commerce 1994.

KEY:

- Primary Commercial Routes
- Designated Airspace
- Special Use Airspace (restricted areas, MOAs, bomb ranges)
- W-497 B — Warning Areas

Figure 3-16 AIRSPACE SYSTEM, NORTHERN FLORIDA/SOUTHERN GEORGIA

helicopter squadrons in addition to various maritime military activities (JAXPORT 1994b).

- NAS Jacksonville, located on the west bank of the St. John's River, has two runways on which long-range maritime surveillance aircraft, aircraft repair missions, and anti-submarine helicopters operate (JAXPORT 1994b).

The determination of regulated airspace, incorporating vertical, horizontal and temporal elements, is necessary for the safe and efficient operation of the regional air facilities. Airspace in the region includes a system of military civilian use airspaces such as tactical ranges and bombing ranges, warning areas along the Atlantic coast, and civilian air routes between commercial air facilities. Figure 3-16 shows the airspace system in the vicinity of Jacksonville.

3.9 Infrastructure and Utilities

3.9.1 Potable Water

NAS Cecil Field obtains water through a series of 11 wells which tap the Floridan Aquifer System and other surficial aquifers located beneath the station. The wells range in depth from 400 to 800 feet BGS and have a combined capacity of 4.8 mgd. The water obtained from the wells is used for potable water and industrial and heating purposes (ABB-ES 1994). Potable water pumped from the wells is stored in underground water tanks and elevated water towers.

The Main Station contains two underground water tanks with a combined capacity of 500,000 gallons and three elevated water tanks with a combined capacity of 600,000 gallons. Two elevated water towers have a capacity of 250,000 gallons each and one has a 100,000-gallon capacity (ABB-ES 1994; NAS Cecil Field 1994). The elevated water tanks are located along "B" Circle near the BEQ, "C" Avenue in the recreation area south of Building 203; and "C" Avenue in the personnel support area north of Building 220 (see Figure 3-17). The Yellow Water Area has an underground water tank with a 200,000-gallon capacity and a 75,000-gallon elevated water tank (Navy 1988).

The supply of potable water at the Main Station is maintained by a multi-unit system using five production wells and treatment facilities (ABB-ES 1994). These five plants use aeration and chlorination for treatment. The water distribution system at NAS Cecil Field consists of a series of 20-, 12-, 10-, 6-, and 4-inch lines that were constructed in the 1940s using standard materials for such a system (probably cast iron). The distribution system within buildings is composed primarily of copper pipe with lead-welded joints, while the

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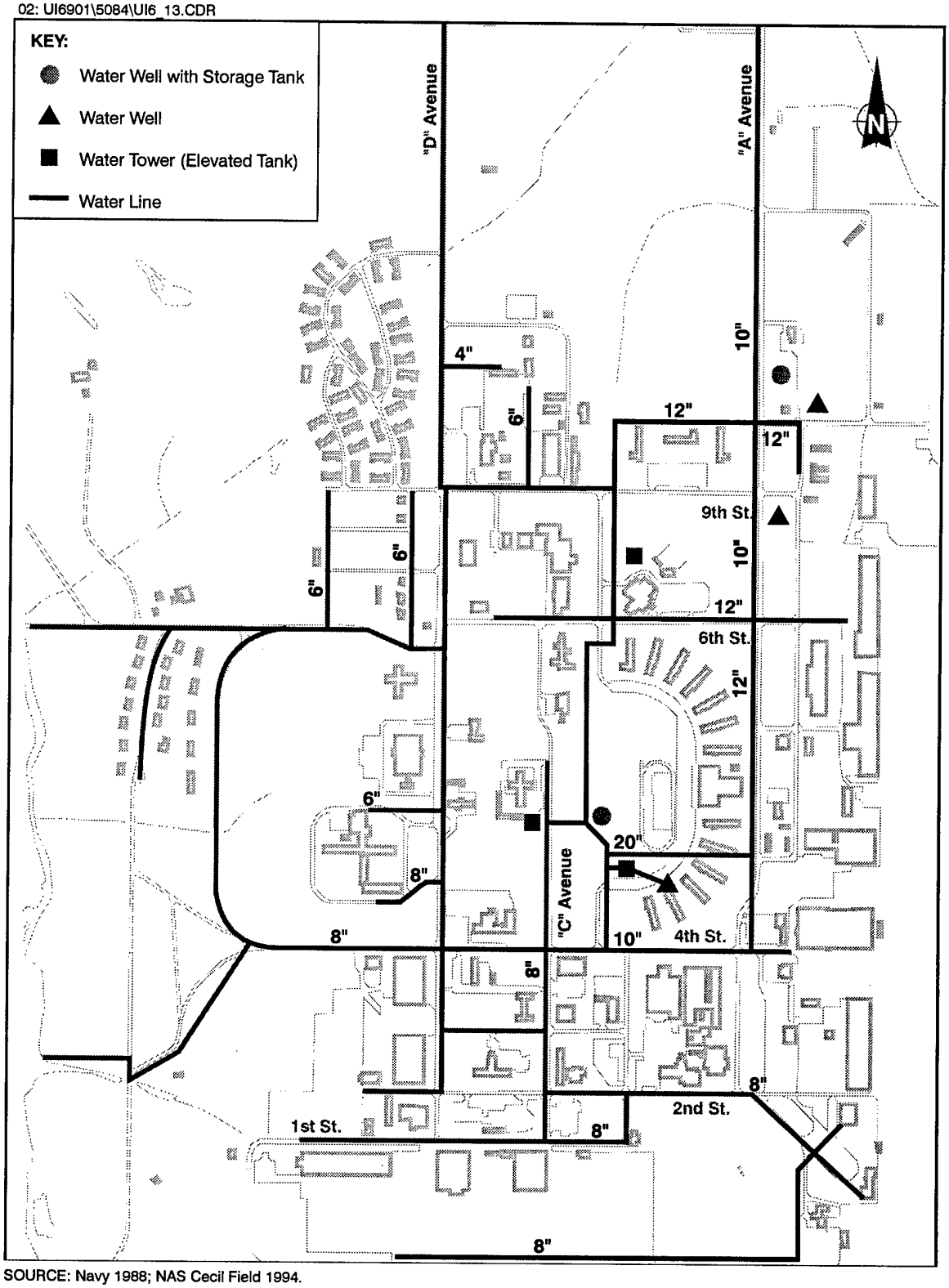

SOURCE: Navy 1988; NAS Cecil Field 1994.

SCALE
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Figure 3-17 WATER FACILITIES - MAIN STATION DEVELOPED AREA

distribution systems in some of the housing units are constructed of either polyvinyl chloride (PVC) or galvanized steel (ABB-ES 1994). Water consumed at the Yellow Water Area is supplied by two on-site groundwater wells and one well at the Yellow Water Family Housing Area (Navy 1988).

3.9.2 Sanitary Sewer

Wastewater is collected and transported at NAS Cecil Field using a system of force mains, gravity flow lines, and lift/pump stations. On the Main Station, force mains range in size from 4 to 10 inches and gravity lines range in size from 6 to 12 inches (see Figure 3-18). The force mains and gravity lines are constructed of steel, cement, and some PVC piping (Willi 1994). Wastewater is transported from the Yellow Water Area to the Main Station by a force main which enters along "D" Avenue. Wastewater generated on the Main Station and the Yellow Water Area is transported to the station's wastewater treatment plant located along 4th Street, approximately 800 feet east of Lake Fretwell. The wastewater treatment plant provides sewage treatment for the majority of NAS Cecil Field and all of the Yellow Water Area. Wastewater from Building Nos. 278, 288, 290, 290B, 352, 500, 510, 540, 573, 595, 810, 854, and 855 is discharged to septic tanks (ABB-ES 1994). Septic tanks are also located at the softball fields along "D" Avenue adjacent to the display aircraft (Heritage Row). The NAS Cecil Field domestic wastewater treatment plant is permitted to operate under a temporary permit issued by FDEP in accordance with the provisions of Chapter 403, FS and FAC Rules. Maintenance and operation of the plant is the responsibility of Navy Public Works Center Jacksonville (Florida Department of Environmental Regulation 1991).

In the mid-1980s, the treatment capacity of the treatment plant was expanded from 820,000 gpd to 1,200,000 gpd (ABB-ES 1994). Current utilization of the plant's capacity is approximately 900,000 gpd or 75% (NAS Cecil Field 1994). The facility is a 1,2000,000-gpd, activated-sludge, domestic wastewater facility consisting of pretreatment, primary and secondary treatment, aerobic digesters, sludge drying beds, and chlorination. The plant discharges into Rowell Creek south of the Lake Fretwell Dam, which flows to Sal Taylor Creek, Yellow Water Creek, and finally Black Creek (Florida Department of Environmental Regulation 1991). The treatment plant provides for 90% removal of 5-day biochemical oxygen and suspended solids (ABB-ES 1994). Reportedly, the wastewater treatment system is in good condition, but groundwater infiltration poses a problem during heavy rainfall events (Willi 1994).

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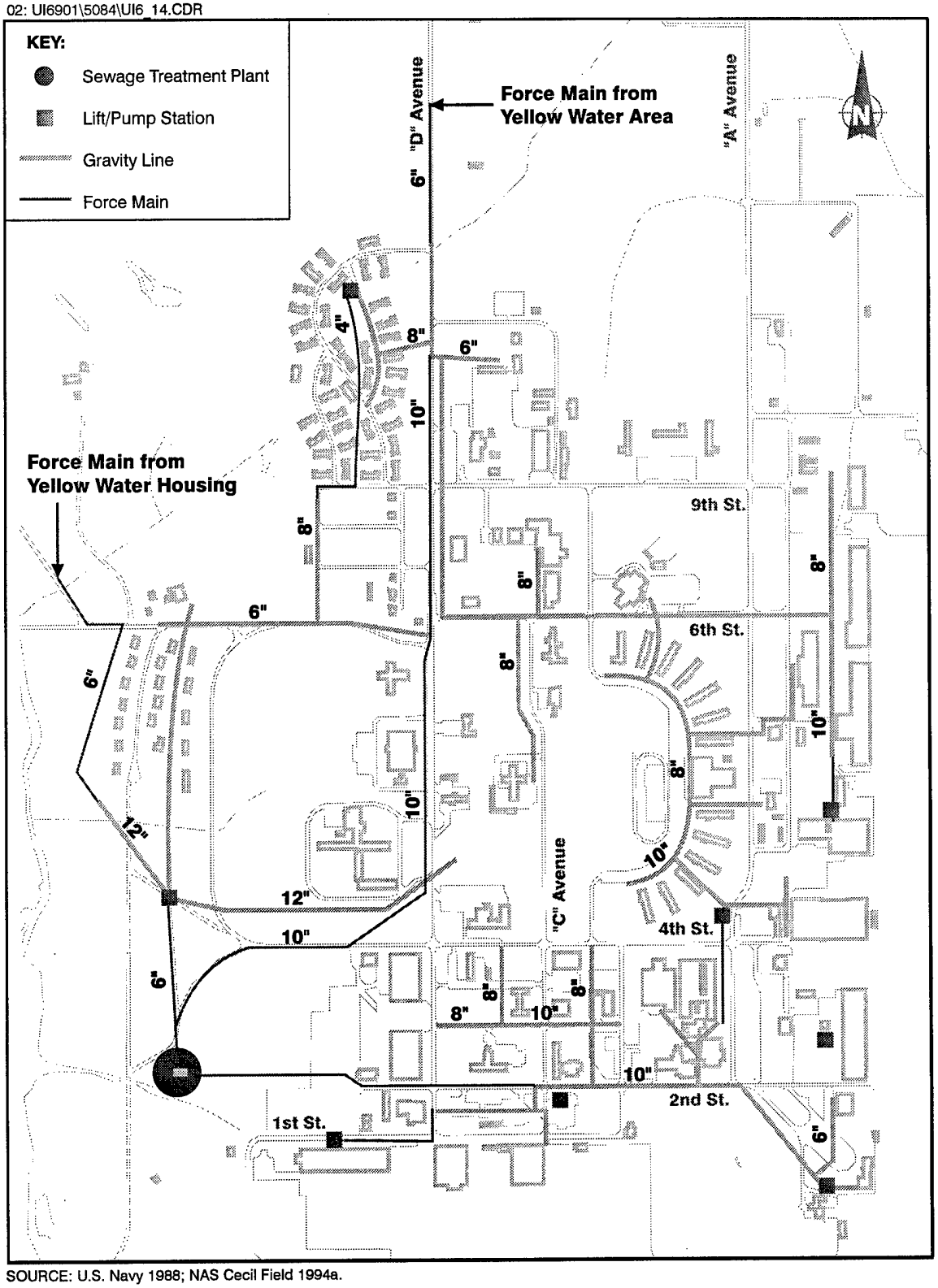

SOURCE: U.S. Navy 1988; NAS Cecil Field 1994a.

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Figure 3-18 SANITARY SEWER FACILITIES - MAIN STATION DEVELOPED AREA

3.9.3 Stormwater Drainage

The stormwater system at the Main Station consists of a system of catch basins and drainage pipes and open swales and culverts. The catch basin and drainage pipe system is concentrated primarily in the air operation areas, and to a lesser extent in the BEQ along "B" Circle. The area contains approximately 116 catch basins and drainage pipes ranging from 18 to 84 inches. In the flight line area, stormwater runoff is collected in the catch basins, conveyed under the aircraft runways by corrugated metal pipe into open swales and discharged into Sal Taylor Creek. Stormwater runoff in the remainder of the Main Station is directed and controlled by a system of open swales and culverts which discharge into Rowell Creek in the western portion of the station (Navy 1988).

Stormwater runoff at the Yellow Water Area has three distinctive drainage patterns and outlets. The northern portion of the site drains along the Brady Branch River and discharges into the St. Marys River. The southern portion of the site drains southward under Normandy Boulevard into Rowell Creek eventually discharging into Lake Fretwell, Sal Taylor Creek, and Yellow Water Creek. The western third of the Yellow Water Area drains into a series of open swales which eventually discharge into Yellow Water Creek (Navy 1988).

3.9.4 Natural Gas

Natural gas is purchased from the People's Gas Company and distributed to the Main Station by a 4-inch line which is connected to the natural gas substation located south of 103rd Street between the "A" Avenue gate and the main gate (Navy 1988). The 4-inch line runs along the abandoned railroad bed to the central steam plant (Building 11) where the gas is used in the production of steam (see Figure 3-19). Two-inch and 1¼-inch diameter laterals from the main line supply natural gas to the family housing areas and Building Nos. 814, 825, 313, 824, 824A, 1823, 1820, 880, 1846, 1821, 338, 14, 11, 68B, 190, 199, 498, 905, 91, and 220. In addition, laterals from the main gas line serve auxiliary steam producing boilers which are located throughout the Main Station (NAS Cecil Field 1994). Natural gas consumption at the Main Station in 1993 ranged from 97,000 to 117,000 therms per month (People's Gas Company 1994).

3.9.5 Electricity

Electricity is supplied to NAS Cecil Field and the Yellow Water Area by the Jacksonville Electric Authority (JEA). Two JEA 26-kilovolt (kV) system feeder lines tie into NAS Cecil Field at an electrical substation located south of 103rd Street between the "A"

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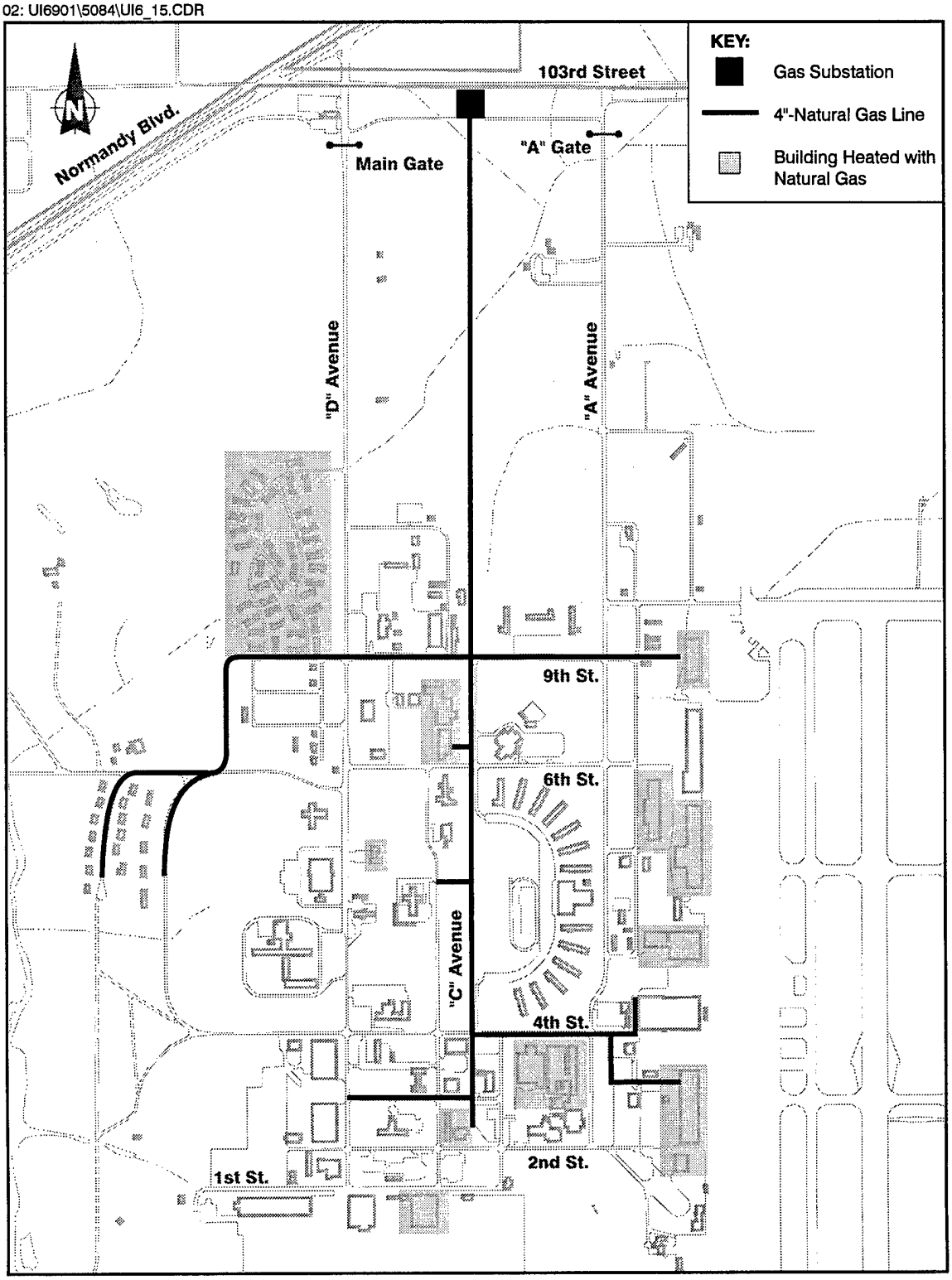

SOURCE: Navy 1988; NAS Cecil Field 1994.

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Figure 3-19 NATURAL GAS FACILITIES - MAIN STATION

Gate and the Main Gate (see Figure 3-20). From the JEA tie-in point, electricity is distributed throughout the base by a series of aboveground and underground power lines. An aboveground 26-kV system line, which is supported by concrete power poles (most power poles on base are constructed of concrete), runs along "A" Avenue and is connected to the south electrical substation located along 2nd Street near Building 294. Another 26-kV system line runs along the abandoned railroad bed and connects the north electrical substation near Building No. 356 to the south electrical substation. The old 26-kV system lines on the Main Station have been replaced with new 26-kV system lines in recent years. An aboveground 4.16-kV system provides electricity to the family housing areas. Diesel- and propane-powered electric generators are located in 35 buildings to provide emergency electricity for essential functions in the event of a power outage.

3.9.6 Steam

Steam is used primarily as a heating system at industrial buildings, hangars, and some other buildings and barracks. Most of the steam used on the station is generated at the central steam plant located in Building 11 near the intersection of 2nd Street and "C" Avenue. The steam is produced from a three-boiler system powered by natural gas and is distributed through aboveground steam lines (see Figure 3-21). Two boilers provide 30,000 pounds per hour (pph) of steam; the third boiler produces 35,000 pph of steam. In recent years, the central steam plant has been supplemented by the installation of a series of auxiliary boiler plants which are also powered by natural gas (Navy 1988).

Auxiliary boilers were implemented in the 1980s because NAS Cecil Field public works personnel determined that in some cases it would be less expensive to run a new gas lateral to an auxiliary boiler than to reroute existing steam lines and place additional demand on the central steam plant. Many of the auxiliary boilers served by natural gas also have a fuel oil system as a back-up system. Auxiliary boilers are generally used when a proposed activity requiring steam is not in the vicinity of an existing steam line (Navy 1988). On-station boilers receive annual testing and certification (Willi 1994).

3.9.7 Compressed Air

The production, distribution, and use of compressed air at NAS Cecil Field is confined to the air operation area and is used primarily in aircraft shops, and was used previously in engine starting modules. Compressed air is produced in Buildings 216, 241, and 862 and distributed on base by a series of 1.25-, 2-, 3-, 4-, 6-, and 8-inch pipes (see Figure 3-22). Building 216 houses two 200-horsepower, two-stage, lubricated, reciprocating

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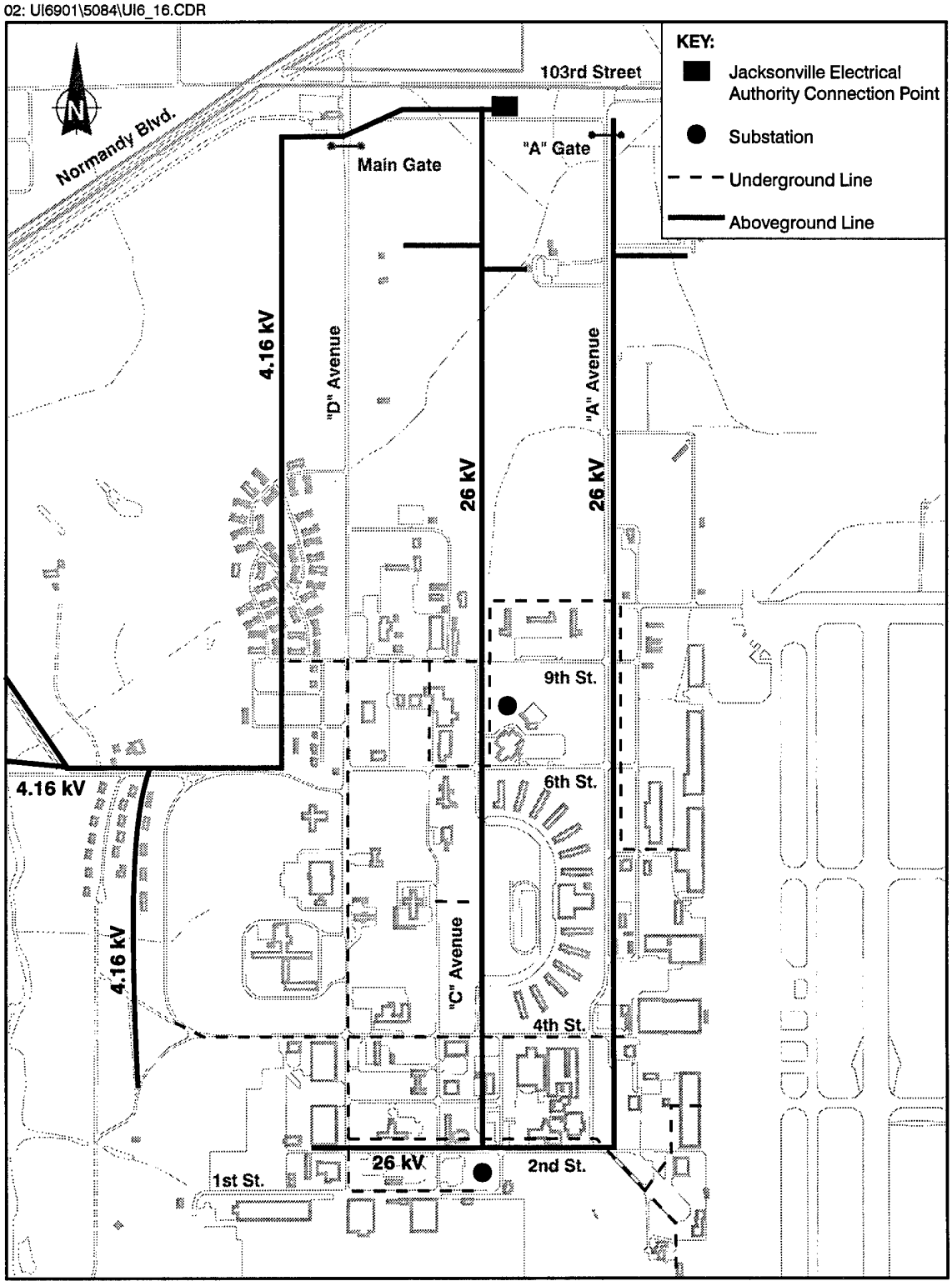

SOURCE: Navy 1988; NAS Cecil Field 1994.

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Figure 3-20 ELECTRICAL DISTRIBUTION - MAIN STATION

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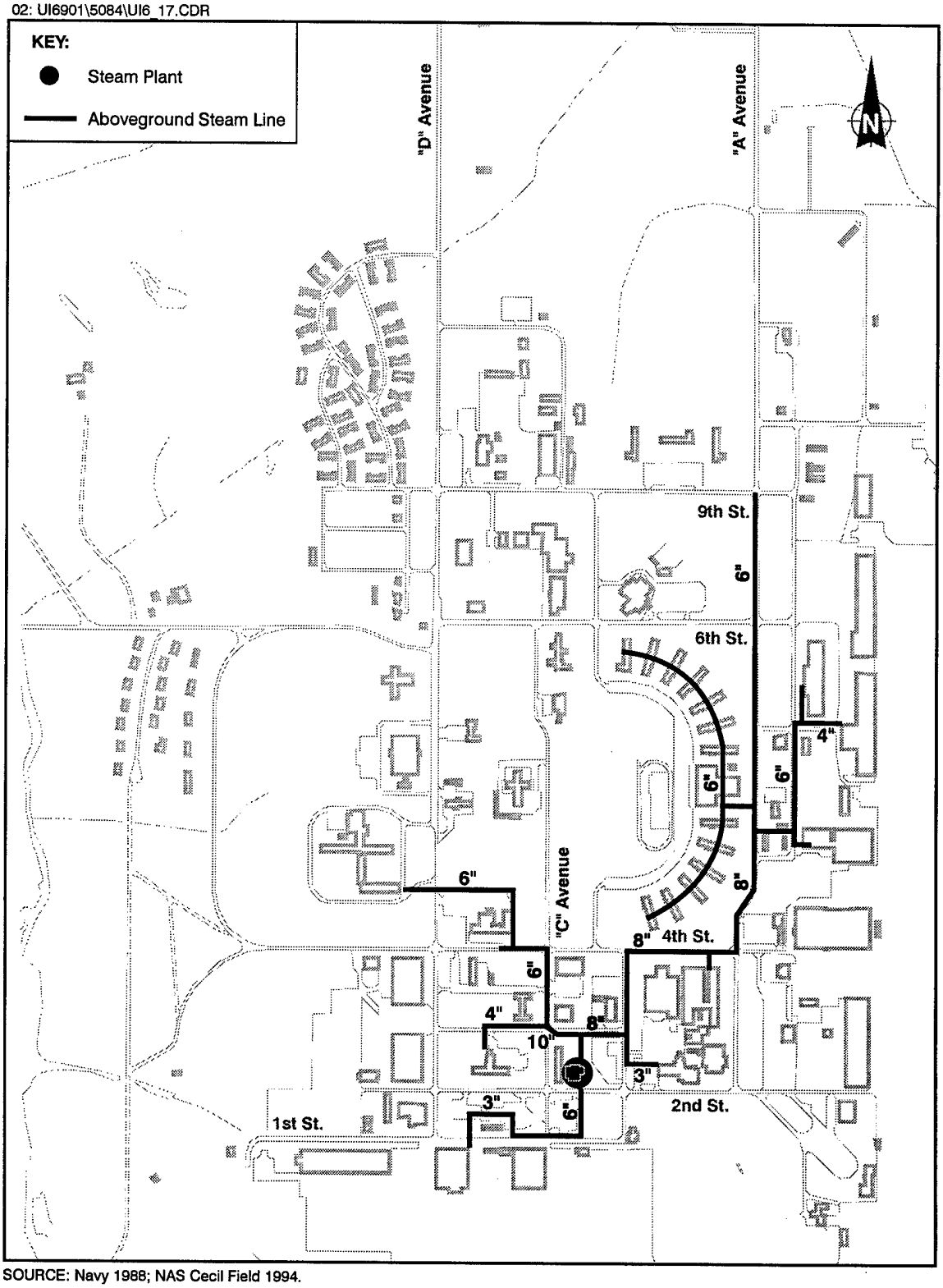

SOURCE: Navy 1988; NAS Cecil Field 1994.

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Figure 3-21 STEAM FACILITIES

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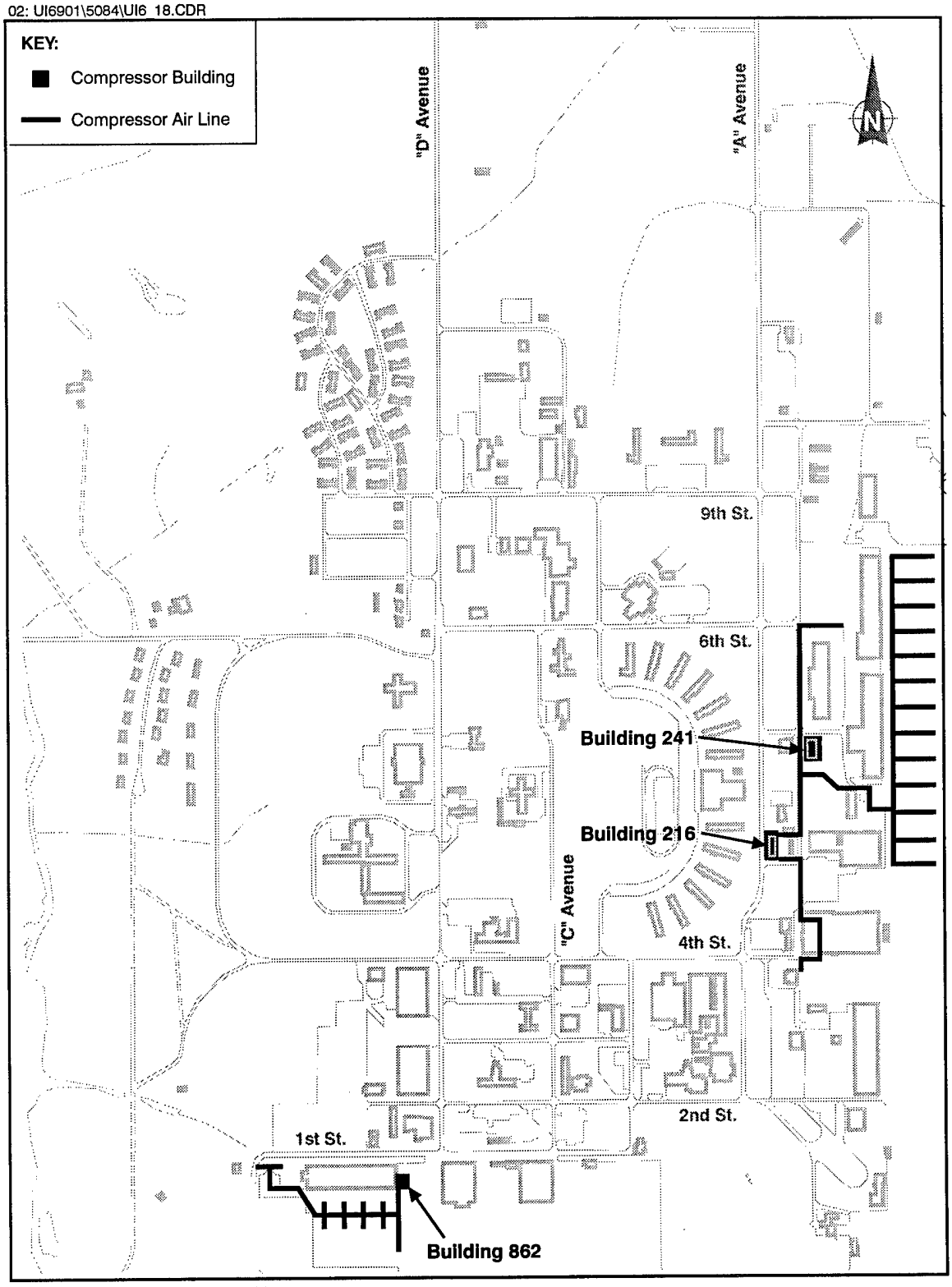

SOURCE: Navy 1988; NAS Cecil Field 1994.

SCALE
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Figure 3-22 COMPRESSED AIR FACILITIES

compressors operating at an output of 125 pounds per square inch (psi). The compressors generate 1,040 cubic feet per minute (cfm) and 1,023 cfm of compressed air, and are connected to one 150-cubic-foot (cf) receiver and one 250-cf receiver.

Building 241 houses two 200-horsepower compressors which generate the required compressed air for the F/A-18 and S-3 aircraft support shops along the north-south flight line. Each compressor in Building 241 is a 590-cfm, two-stage, lubricated, reciprocating compressors operating at 300 psi with a 500-psi rating. Three 115-cf receivers and seven 105-cf receivers are connected to the system.

Building 862 houses two 125-horsepower compressors operating at 300 psi. Each compressor is a 286-cfm, two-stage, lubricated, reciprocating unit rated at 500 psi. The compressors are connected to 12 114-cf receivers. The two compressors produce the air required by the S-3 hangar.

It should be noted that aircraft previously stationed at NAS Cecil Field required air-start systems. While no longer in use, the air-start systems are still in place. However, several lines have been abandoned due to leaks. Some of the compressed air previously used by the air-start system has been diverted to the aircraft support shops (Willi 1994).

3.9.8 Aviation Fuel

NAS Jacksonville, which is approximately 15 miles east of the station, provides NAS Cecil Field with jet fuel through a pipeline. The pipeline enters NAS Cecil Field at the "A" Gate and runs south along "A" Avenue to the station's North Fuel Farm (NFF). Facilities at the NFF include six 595,000-gallon, steel-welded, earth-covered tanks, an administration building, four support structures, and a dispensing-truck filling area. The jet fuel is transported south along "A" Avenue by a 10-inch pipeline to two 210,000-gallon day tanks located in the air operation area (see Figure 3-23) (NAS Cecil Field 1994; Navy 1988). From the day tanks, fuel is circulated in a continuous loop to the two high-speed refueling facilities along the aircraft parking aprons (ABB-ES 1994). The high-speed refueling offices are located in Buildings 293 and 341. Current plans call for the closure of the pipeline and NFF; these facilities would not be transferred to other entities for reuse.

3.9.9 Solid Waste

Approximately 380,000 tons of waste is generated at NAS Cecil Field annually. Solid waste generated at the station is delivered by a private contractor to the Trail Ridge Landfill located in Baldwin, off of SR 301. This landfill has a projected capacity of approximately 17 years (Perkins 1996).

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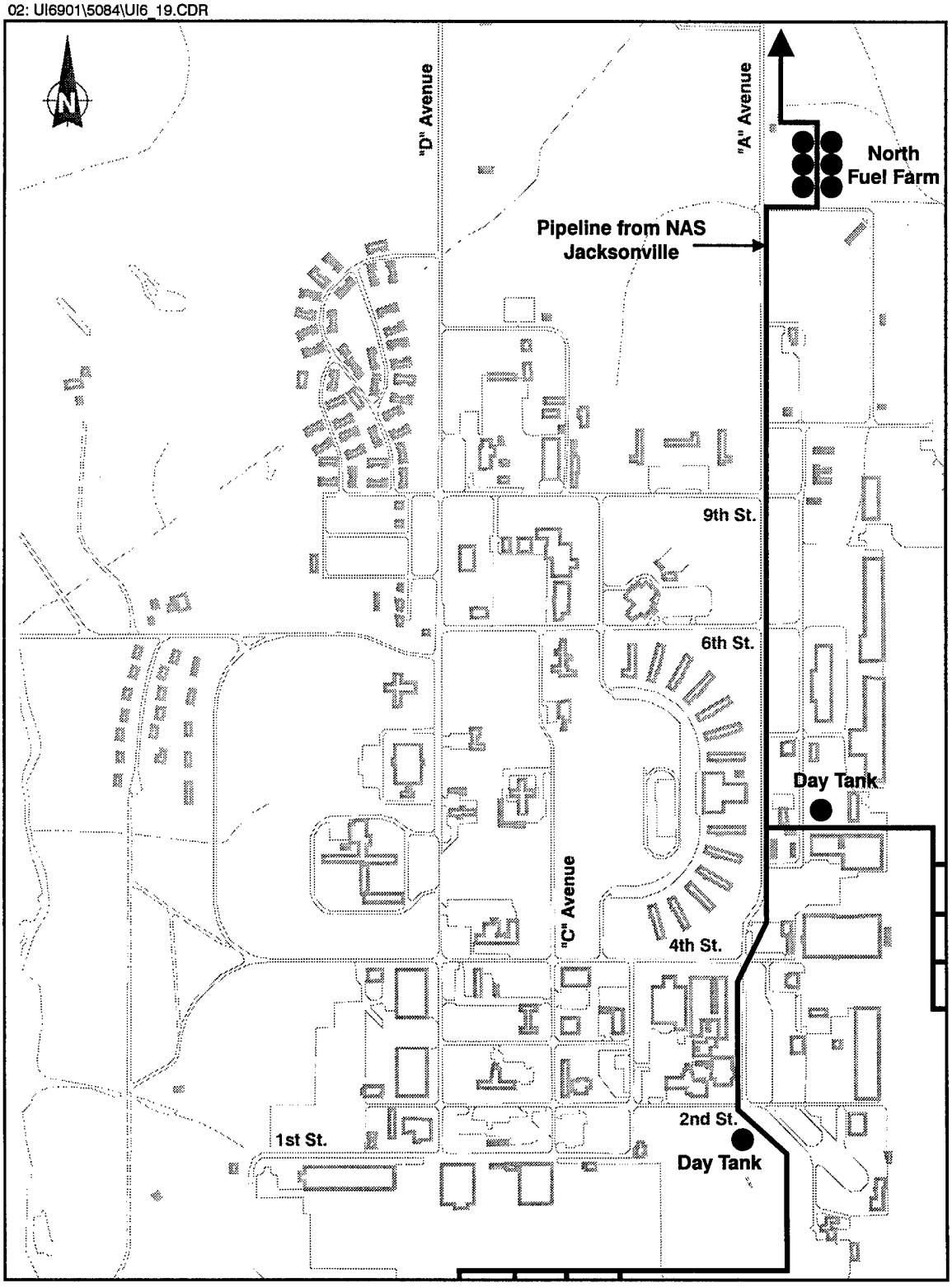


SOURCE: Navy 1988; NAS Cecil Field 1994.

SCALE
0 1,200 2,400 Feet

Figure 3-23 AVIATION FUEL FACILITIES

3.9.10 Regional Infrastructure Issues

Following the transfer of NAS Cecil Field property from the federal government to another entity, future infrastructure issues and developments will be subject to the policies set forth in the potable water, sanitary sewer, drainage, and capital improvement elements of the local comprehensive plan. The Jacksonville/Duval County Comprehensive Plan currently identifies the eastern boundary of NAS Cecil Field (i.e., Main Station and Yellow Water Area) as the western extension of its urban service area. This indicates that Duval County intends to extend urban services (i.e., water and sewer) up to the eastern property boundary of NAS Cecil Field, but it does not intend to extend services onto the property within the 2010 planning period. It should be noted that the urban service area is subject to modification through a comprehensive plan amendment.

The City of Jacksonville Department of Public Utilities (JDPU) administers existing infrastructure facilities in the vicinity of NAS Cecil Field, and JDPU has developed preliminary plans that show water and sewer extensions to NAS Cecil Field. The existing JDPU infrastructure includes a 16-inch sanitary sewer force main that runs along 103rd Street and is connected to a 10-inch force main that serves the Bent Creek subdivision, which is approximately 0.5 mile east of the Main Station (Williams 1994). These sanitary sewer lines are part of JDPU's Sewer District 3 (southwest district), which covers approximately 71 square miles (Jacksonville Planning and Development Department 1990). The wastewater treatment plant that serves District 3 was expanded to 10.0 mgd in 1988 and currently handles 6.5 mgd (Land 1994).

A 16-inch potable water main also exists in the vicinity of the station. The main runs parallel to 103rd Street and is connected to a 12-inch water main that serves the Bent Creek subdivision (Land 1994). These water mains are part of JDPU's North Grid water district and consist of approximately 206 square miles. The north district is served by water obtained from the Floridan Aquifer System (Jacksonville Planning and Development Department 1990).

3.10 Cultural Resources

In accordance with the Navy's documentation requirements under the National Historic Preservation Act (NHPA), a cultural resource assessment for NAS Cecil Field was conducted and submitted to the Florida Division of Historical Resources in 1995 (E & E 1995). This assessment consisted of two components:

- An archaeological sensitivity assessment, which included documentation and background research, field reconnaissance, and the development of a predictive model for identifying potentially archaeologically sensitive areas at the station; and

- A comprehensive building survey, which included photo-documentation, development of the historic context for station development, and assessment of the station's buildings eligibility for inclusion on the National Register of Historic Places (NRHP).

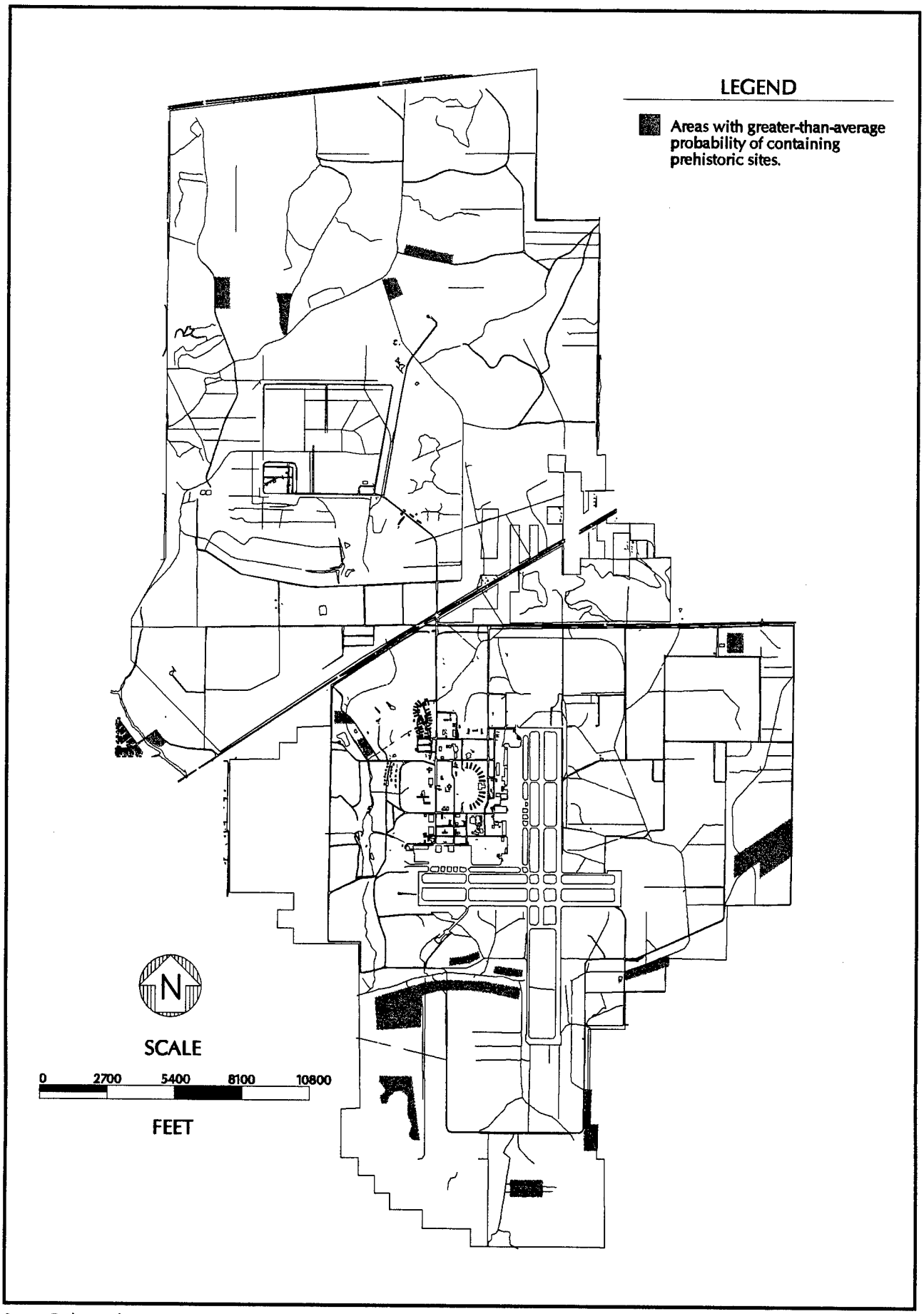
The Florida Division of Historical Resources concurred with the findings of this assessment in August 1995 (see Appendix C). The following sections provide a brief summary of the findings of this assessment.

3.10.1 Archaeological Resources

Examination of site files at the Florida Division of Historical Resources has demonstrated that no prehistoric archaeological sites are known to exist at NAS Cecil Field. One historic site, a cemetery dating to 1881, is located in the northwest portion of the Main Station. This property is not part of the station; however, the Navy is responsible for providing access to the area.

The facility lies within the coastal lowlands of Florida and incorporates low-lying swampy terrain and pine flatwoods. It corresponds to a prehistorically marginal environment between St. Johns Valley to the east, which was extensively used by Native American groups, and upland areas to the west. Prehistoric land use in the area of the station was likely to be limited to occasional hunting forays (E & E 1995).

Substantial portions of the surface of the facility (approximately 3,900 acres) underwent extensive disturbance during the course of the land-moving operations undertaken by the Navy. These operations included grading, logging, sediment borrowing, fill deposition, stream rechanneling, and excavation of trenches for subsurface utilities. These disturbed portions of NAS Cecil Field are not likely to contain intact archaeological resources. The archaeological sensitivity assessment of the station indicated that 19 areas (16 on the Main Station/Yellow Water Area and three at OLF Whitehouse) totaling 634 acres have a higher-than-average probability of containing prehistoric sites (E & E 1995). Figure 3-24 depicts potential archaeologically sensitive areas on the Main Station and the Yellow Water Area.



Source: Ecology and Environment, Inc. 1995

Figure 3-24 ARCHAEOLOGICALLY SENSITIVE AREAS
MAIN STATION / YELLOW WATER AREA

3.10.2 Architectural Resources

NAS Cecil Field contains 457 structures including those pertaining to administration, aviation support, operations, ordnance, facility support, and recreation. Most buildings were built in the 1940s and 1950s. As part of the cultural resources assessment these structures were evaluated as to their eligibility for listing on the NRHP according to the criteria promulgated in Title 36, CFR Part 800. It has been determined that existing structures do not meet NRHP eligibility criteria (E & E 1995).

3.11 Hazardous Materials Management and Environmental Contamination

The following section summarizes the analysis and results of the *BRAC Environmental Baseline Survey (EBS) Report* (ABB-ES 1994). This report was prepared in compliance with the DoD *BRAC Cleanup Plan Guidebook* (DoD 1993) (which supersedes OPNAVINST 5090.18 Chapter 15). The *EBS Report* is a compilation of all existing information related to storage, release, treatment, and disposal of hazardous substances or petroleum products at NAS Cecil Field under all regulatory programs (i.e., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]; Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA], etc.), as well as the status of compliance, removal, closure, and remediation.

The *EBS Report* was completed in 1994 in compliance with the Community Environmental Response Facilitation Act (CERFA). CERFA was enacted in 1992 as an amendment to CERCLA to facilitate the transfer of real property at closed military installations. CERFA requires that uncontaminated properties at closed military installations be identified to facilitate early transfer and reuse of those properties. To identify uncontaminated properties, the following potential areas of environmental contamination were investigated: hazardous materials and waste management, Installation Restoration Program (IRP) sites, petroleum storage tanks, lead in drinking water, oil/water separators, asbestos, lead-based paint, PCBs, pesticides, medical and biohazardous waste, ordnance, radioactive materials and mixed waste, and radon. Air emissions and wastewater treatment plant operations were also investigated. The investigation covered 617 buildings, 21 open areas, 19 IRP sites, 16 Areas of Interest (AOIs) and two crash sites.

Each building and parcel was classified in a color-coded classification scheme to indicate its suitability for transfer. The color classification scheme is shown on Table 3-23. The first four color classifications are suitable for transfer (i.e., white, blue, light green, and

Table 3-23

COLOR CLASSIFICATION SYSTEM FOR ENVIRONMENTAL CONDITIONS AT NAS CECIL FIELD

1	White: Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).
2	Blue: Areas where only storage of hazardous substances or petroleum products has occurred (but no release, disposal, or migration from adjacent areas has occurred).
3	Light Green: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but at concentrations that do not require a removal or remedial action.
4	Dark Green: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	Yellow: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and removal and/or remedial actions are underway, but all required remedial actions have not yet been taken.
6	Red: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not been implemented.
7	Grey: Areas that have not been evaluated or require additional evaluation.

Source: ABB-ES 1994.

dark green). Buildings or parcels that are not suitable for transfer are addressed under the *BRAC Clean-up Plan*, which outlines the strategy and schedule for selecting and implementing response actions. These properties were color-coded yellow, red, or gray (ABB-ES 1995). Categorization of the buildings and parcels covered in the EBS Report are shown on Figure 3-25. Color codes are updated annually based upon the status of investigations and remedial actions, if applicable.

3.11.1 Hazardous Materials and Waste Management

Operations at NAS Cecil Field, including engine repair facilities, aircraft maintenance facilities, and engine test cells generate hazardous wastes. In FY 1994, a total of 105,640 pounds of hazardous waste was generated (ABB-ES 1995). Typical wastes included paints and paints thinners, hydraulic fluids, waste oils, solvents, metals, and batteries (ABB-ES 1995).

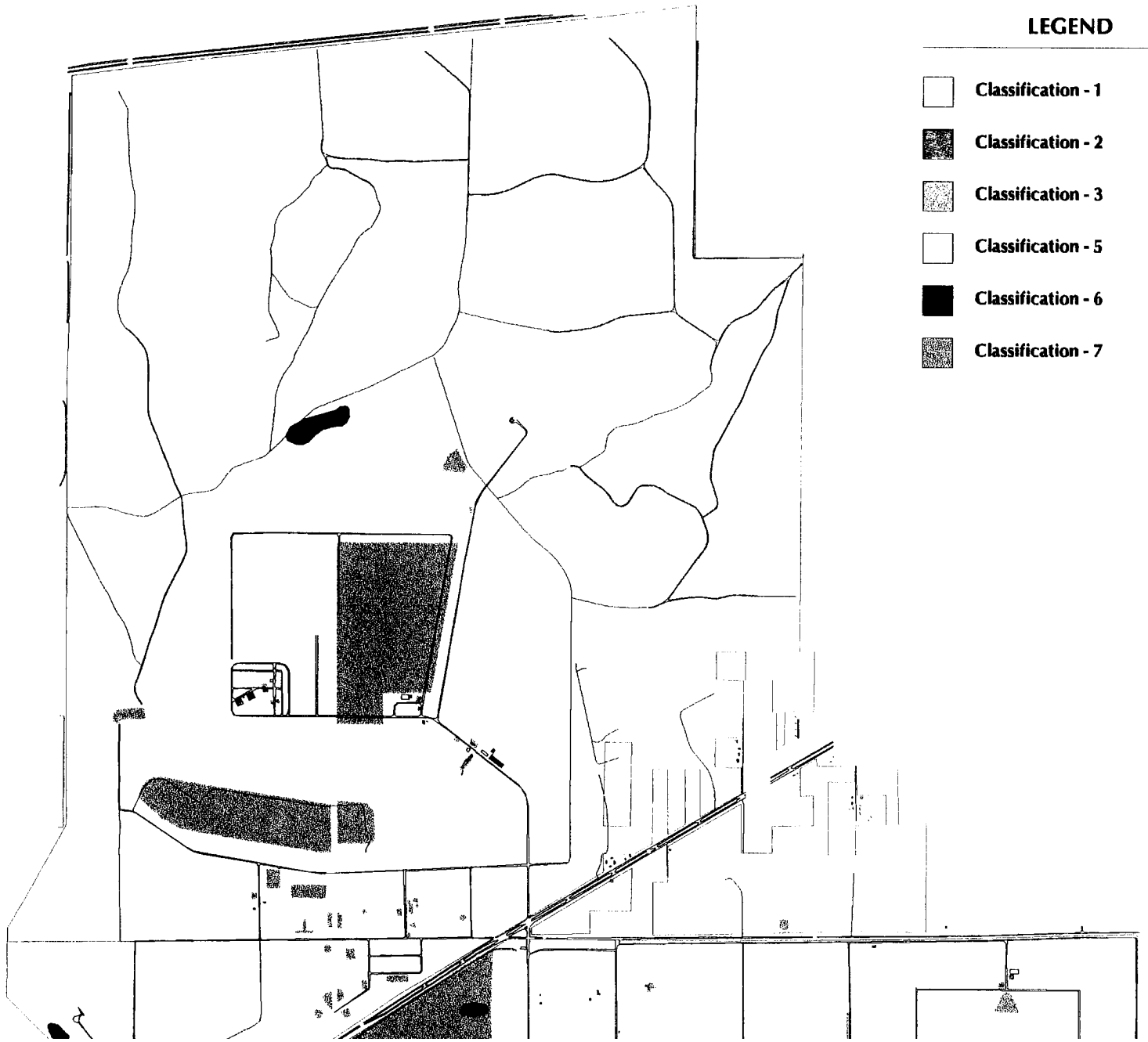
NAS Cecil Field is a permitted large-quantity generator and has interim status under RCRA for hazardous waste storage through 1998. Thirty-one temporary collection points (i.e., operational sites where the hazardous waste is generated) and three satellite accumulation areas are located throughout the facility. Hazardous waste is collected from the satellite accumulation areas and taken to Building 610 in the Yellow Water Area for storage prior to off-site disposal.

3.11.2 Installation Restoration Program Status

The IRP was initiated by the Navy pursuant to CERCLA to identify, assess and remediate contaminated sites on DoD property. An Initial Assessment Study was completed by the Navy in 1985 that identified 18 hazardous waste sites at NAS Cecil Field. Site 19 was added in 1988, and one of the original sites was transferred to the UST Program (discussed in Section 3.11.3). NAS Cecil Field is listed under CERCLA on the EPA's National Priorities List (NPL), and remediation of IRP sites is governed by a Federal Facilities Agreement (FFA) involving the Navy, EPA, and FDEP (ABB-ES 1995). A description of the IRP sites is presented in Table 3-24 and site locations are shown on Figure 3-26.

Sixteen AOIs were discovered by the Environmental Coordinator at NAS Cecil Field subsequent to the FFA. A list and description of these AOIs is presented in Table 3-25.

In addition, the EBS identified additional AOIs (i.e, those areas color-coded yellow, red or grey). These newly discovered AOIs and the original 16 AOIs will be addressed through the *BRAC Cleanup Plan*.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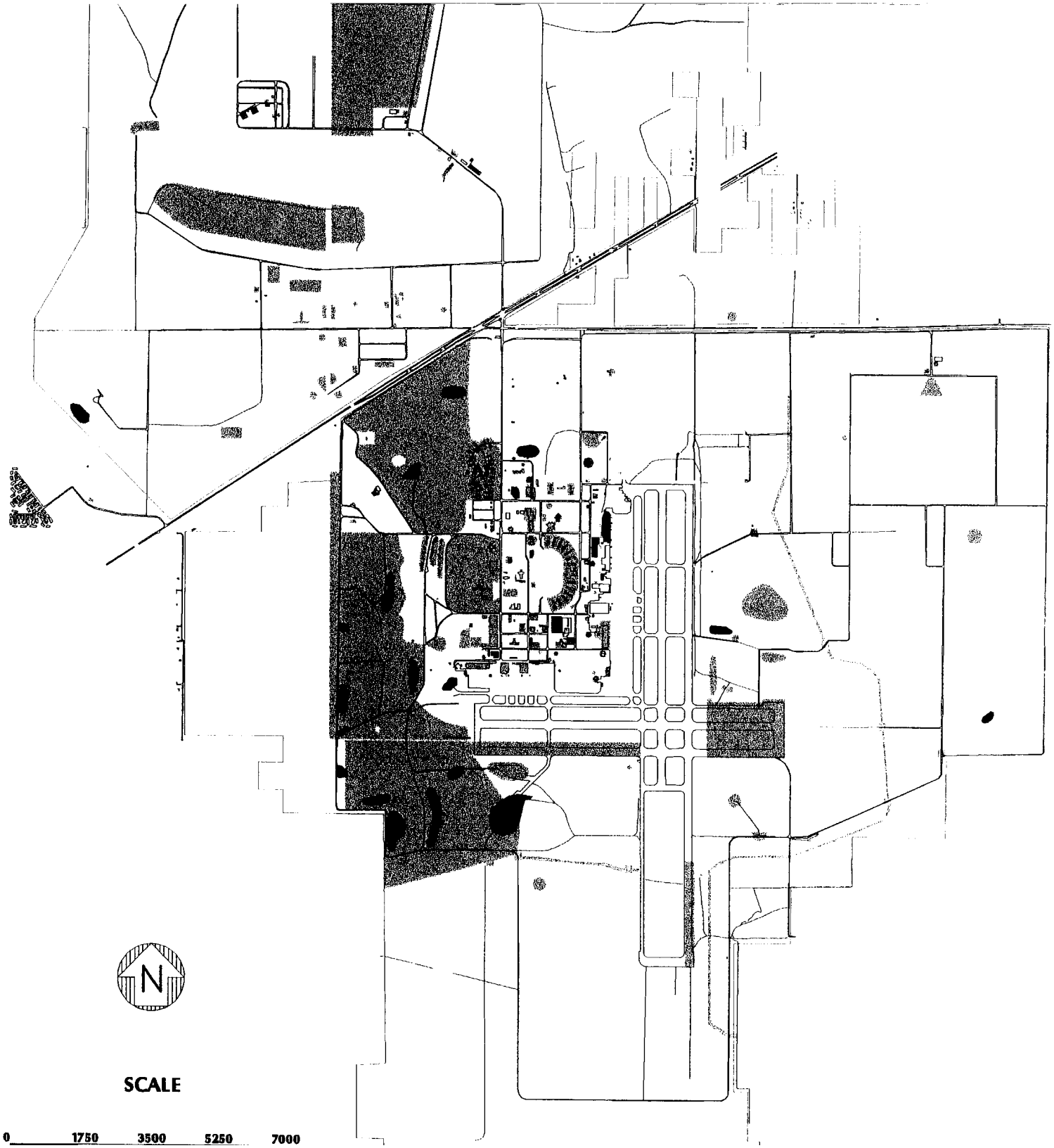
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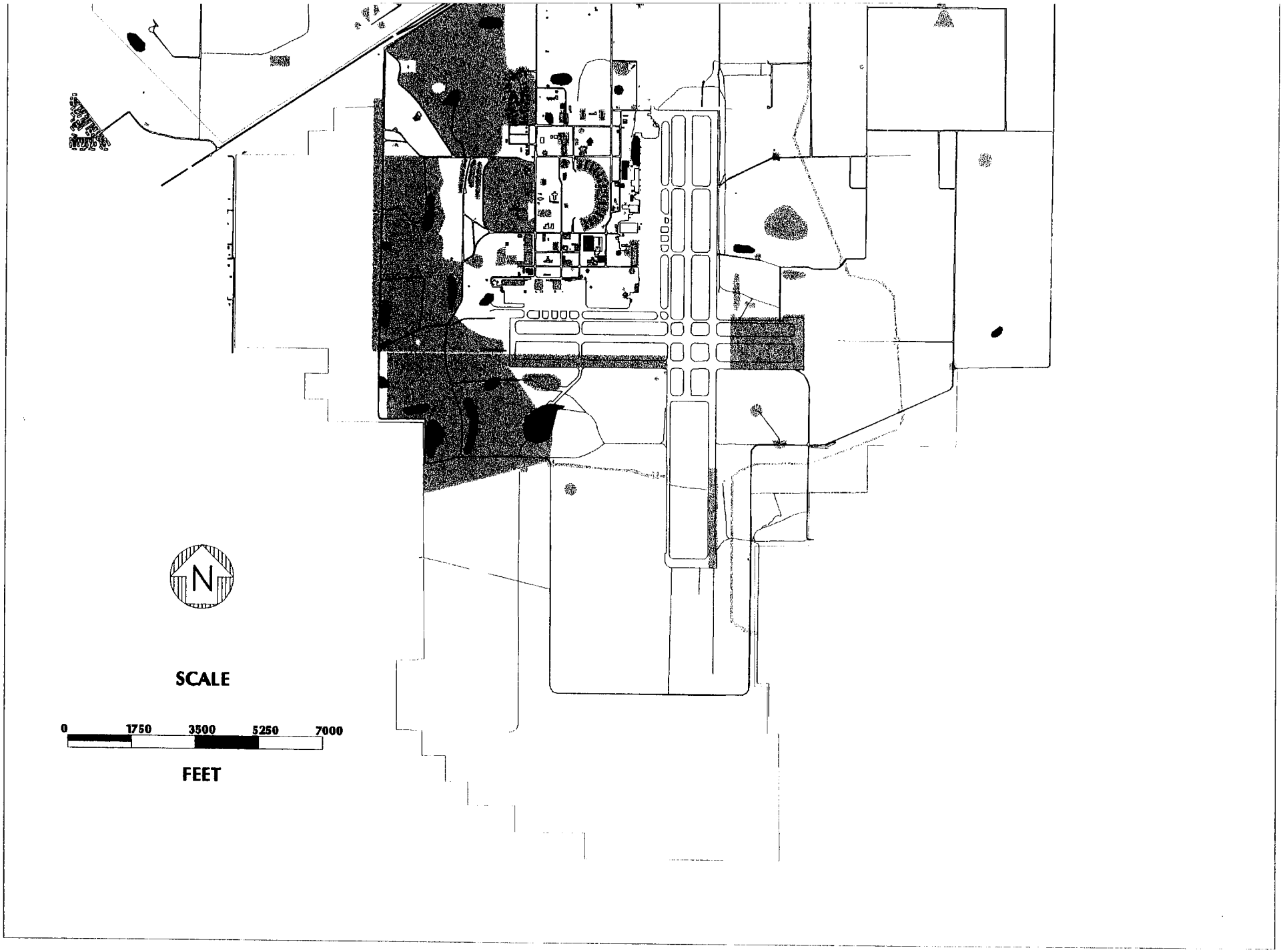

Source: ABB-ES 1995

(3)

Figure 3-25 HAZARDOUS WASTE AREAS - MAIN STATION / YELLOW WATER AREA

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
1	OU 1	Old Landfill (9 acres)	1950s-1965	Solid waste, oils, fuels, paints, paint stripper, solvents, municipal solid waste	Municipal solid waste, industrial operations	Trench and fill landfill for commercial and residential wastes (solid and liquid).	1, 2, 5, 10, 12, 14, 15, 16, 19, 20, 35, 36, 37, 48, 49, 50, 59, 60, 72, 79, 81
	Current Investigative Status: Final Remedial Investigation (RI), Baseline Risk Assessment (BRA), and Feasibility Study (FS) reports submitted March 1994. Data indicate a potential risk to benthic macroinvertebrates in drainage ditch at Site 2. Final Proposed Plan submitted April 27, 1995. Public Meeting held May 2, 1995. Final Record of Decision (ROD) submitted September 26, 1995. The selected remedial alternative is site closure, a source-control alternative. The source control alternative includes landfill gas, radiological, and unexploded ordnance surveys, surface debris removal, groundwater monitoring, post-closure care, and a 5-year review. Final design submitted April 1996. Remedial action scheduled to begin in fall 1996.						
2	OU 1	Recent Landfill (5 acres)	1965-1975	Solid waste, oils, fuels, paints, paint stripper, solvents	Industrial operations and shops	Trench and fill landfill for commercial and residential wastes (solid and liquid).	1, 2, 5, 10, 12, 14, 15, 16, 19, 20, 35, 36, 37, 48, 49, 50, 59, 60, 72, 79, 81
	Current Investigative Status: Final Remedial Investigation (RI), Baseline Risk Assessment (BRA), and Feasibility Study (FS) reports submitted March 1995. Data indicate a potential risk to benthic macroinvertebrates in drainage ditch at Site 2. Final Proposed Plan submitted April 27, 1995. Public Meeting held May 2, 1995. Final Record of Decision (ROD) submitted September 26, 1995. Remedial alternatives include site closure (source-control) and biomonitoring in the wetlands area (risk-reduction). Source controls include landfill gas, radiological, and unexploded ordnance surveys, surface debris removal, groundwater monitoring, postclosure care, and a 5-year review. Risk reductions include chemical analysis of surface water and sediment, identification of the bacteria present in the drainage structure, sampling of benthic macroinvertebrates, and toxicity testing of sediment. Final design submitted April 1996. Remedial action scheduled to begin in fall 1996.						
3	OU 8	Oil/Sludge Disposal Pit (50-100 feet in diameter and 3 to 5 feet deep)	1950s-1975	Waste fuels, oils, paints, paint strippers, solvents	Fuel farm, AIMD, squadrons, public works shops	At least four shallow pits were used to dispose of liquid wastes and sludge. Extent of contamination is much greater than originally anticipated.	2, 5, 10, 12, 14, 15, 16, 19, 27, 62, 63, 65, 82
	Current Investigative Status: Remedial investigation complete. Draft RI and BRA submitted April 1995; Draft FS submitted May 1995. Final RI report submitted February 1996. Agencies reviewing Navy responses to their comments on the BRA and FS reports. Contingent on the review times final FS and BRA documents are scheduled for completion in October 1996. Potential risk to human health exists if the groundwater of the surficial aquifer were used as a potable water source.						

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
4	--	Grease Pits (9 acres)	1950s-1983	Waste oils, mess greases	Installation dining facilities and facility oil/water separators	Multiple shallow pits excavated to dispose of liquid wastes (grease from dining facilities and waste oils from oil/water separators) and then covered with fill. Extent of contamination may be greater than anticipated (22 acres).	2, 5, 8, 10, 12, 14, 15, 16, 19, 27, 31, 42, 56
	Current Investigative Status: Treatability Study Workplan completed. Passive soil gas survey completed (final report available). Field Investigation Workplan submitted March 1995. Scheduled field investigation includes surface and subsurface soil sampling, monitoring well installation, and groundwater sampling. Additional field investigation activities currently scheduled for Fiscal Year (FY) 1997.						
5	OU 2	Oil Disposal Area Northwest (100 feet in diameter)	1950s	Oil, fuel	Fuel farms	Shallow, unlined pit where liquid wastes were disposed (petroleum products present).	2, 5, 10, 12, 14, 15, 16, 19, 27, 28, 32, 45, 66, 67, 70, 71, 80, 85
	Current Investigative Status: Interim ROD (IROD) signed in September 1994. Interim remedial action (IRA) initiated in March 1995 for source removal. IRA includes removal and disposal of free petroleum product and removal and treatment of contaminated soil using bioremediation. Bioremediation activities are ongoing. Final RI and RA submitted May 1995; Final FS submitted July 1995. Data indicate a potential risk to benthic macroinvertebrates in drainage ditch. Potential risk to human health exists if the groundwater of the surficial aquifer were used as a potable water source. Proposed Plan submitted and public meeting completed in July 1995. Final ROD submitted September 1995. Risk reduction remedial alternatives include excavation and treatment of sediment in drainage ditch, on-site treatment of contaminated groundwater, a restriction of all use of groundwater from the surficial aquifer.						
6	--	Lake Fretwell Rubble Disposal Area (3.5 acres)	1950s-1984	Inert rubble	Concrete/asphalt from demolition of runway, construction debris, lumber, scrap metal, cut foliage	Rubble disposed along banks of a low-lying marsh area by public works; some of the rubble has been overlain with soil and sod; additional rubble is uncovered.	2, 5, 21, 56
	Current Investigative Status: Six surface soil samples collected for on-site USEPA methods 8010 and 8020 analyses. Letter report submitted to Navy on May 21, 1993. Field Investigation Plan submitted March 1995. Scheduled field investigation includes geophysical surveys, monitoring well installation, surface and subsurface soil sampling, surface water and sediment sampling, and groundwater sampling. Additional field investigation activities currently scheduled for FY 1997, depending on funding allocation.						
7	OU 3	Old Fire Fighting Training Area (1/3 acre)	1950s-1975	Waste fuels, oil, solvents, paint, paint strippers	Fuel farm, AIMD, squadrons, public works shops	Burnable liquid wastes were poured onto metal objects (jets) in shallow, unlined pits and ignited for fire fighting training	2, 5, 25

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
	Current Investigative Status: Field screening initiated in April 1994. Final RI/FS workplan submitted to regulatory agencies December 1994. RI field investigation as defined in workplan completed in summer 1995. Preparation of draft RI/RA report initiated in March 1996.						
8	OU 3	Bore Site Range/ Hazardous Waste Storage Area/Fire Fighting Training (6 acres)	1975-1984	Waste fuels, oil, solvents, paint, paint strippers, lead	Fuel farm, AIMD, squadrons, public works shops	Burnable liquid wastes were poured onto metal objects (jets) in shallow, unlined pits and ignited for fire fighting training. Bore site range was used for machine gun and small arms practice. 55-gallon drums of waste were stored at the site and were used as targets for practice.	2, 5, 25
	Current Investigative Status: Field screening initiated in June 1994. Final RI/FS workplan submitted to regulatory agencies November 1994. RI field investigation as defined in workplan completed in summer 1995. Preparation of draft RI/RA report initiated in March 1996.						
9	–	Recent Grease Pits (0.5 acre)	1983-1984	Grease mixed with water	Installation messes	Three shallow pits were used to dispose of kitchen grease; pits were used until full and then a new pit was excavated.	2, 5, 56
	Current Investigative Status: Field Investigation Workplan submitted March 1995. Field investigation to include geophysical survey, hydrological assessment, soil coring or trenching program, monitoring well installation, surface water and subsurface soil , surface and sediment, and groundwater sampling. Field investigation activities scheduled for FY 1997 pending funding allocation.						
10	OU 4	Rubble Disposal Area (6.5 acres)	1950s-1960s	Inert Rubble	Building demolition debris, runway debris	Surface disposal area with debris (demolition, roadway, metal); information is limited	2, 12, 25, 87
	Current Investigative Status: Final RI/FS workplan submitted in November 1994. RI field investigation as defined in workplan completed in summer 1995. Draft RI/RA report submitted on June 7, 1996 for regulatory review.						
11	OU 6	Golf Course Pesticide Disposal Area	1970s-1978	Pesticides, fungicides, and herbicide containers, vehicles, metal debris	Golf course maintenance area	Reported, between 200 and 400 empty 5-gallon cans containing pesticides were buried at the site; a limited number of full containers of pesticides were buried in 1978.	2, 5, 25, 26, 30, 34, 42, 75

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
	Current Investigative Status: Focused Feasibility Study for source control submitted. Proposed plan and public comment period completed. Final design submitted in April 1994. Public meeting held on March 8, 1994. Final IROD submitted to the regulatory agencies in August 1994. IRA completed in January 1996. Approximately 2 acres of the historical site has been cleared and a geophysical survey of the cleared area has been completed. Test pitting located the presence of 41 pesticide containers. Full and partially full containers were sampled and placed in overpack drums. Two soil samples were collected for analysis. Sample of contents of two drums submitted for off-site analyses for organophosphorus pesticides, TCL Pesticides/PCBs, and Herbicides (final report available). Final RI/FS workplan submitted to regulatory agencies November 1994. Technical Memorandum for revision of sample locations submitted August 1995 was approved in March 1996. Confirmatory field program completed in June 1996.						
12	--	Public Works Rubble Disposal Area (0.5 acre)	1970s-1984	Inert rubble, lumber, concrete, wire, cable, scrap metal, drums	Public works	Majority of rubble has been buried approximately 3 feet below surface, some rubble is above ground.	2, 5, 56
	Current Investigative Status: Field Investigation Workplan submitted March 1995. Field investigation to include geophysical survey, hydrological assessment, monitoring well installation, surface water and subsurface soil, surface and sediment, and groundwater sampling. Field investigation activities scheduled for FY 1997 pending allocation of funds.						
13	--	Day Tank 1-Fuel Spill (1.5 acres)	1981	JP-5 fuel	Day tank	Location of fuel spill in 1981; approximately 500,000 gallons of JP-5 fuel were spilled; approximately 250,000 gallons were recovered. A decision was made in 1987 to allow the fuel to naturally biodegrade.	2, 42
	Current Investigative Status: Transferred to the petroleum program for assessment. The contamination assessment was completed in 1993 and a Contamination Assessment Report (CAR) addendum was submitted to FDEP in December 1993. Upon approval of the CAR, a Remedial Action Plan (RAP) was submitted to FDEP on May 24, 1994. RAP not approved by FDEP. Alternate Procedure Request (APR) submitted to FDEP on August 4, 1995. Pumping test performed at the site in September 1995. Currently other alternatives are being evaluated for free product recovery.						
14	OU 5	Blue 5 Ordnance Disposal Area (4.5 acres)	1967-1977	Fuses, 100-pound bombs, large munitions, lulu fuses, other explosive materials	Installation ordnance disposal operations	Ordnance disposal by open detonation or burning.	2, 12, 25
	Current Investigative Status: Preliminary surface water/sediment sampling completed. Final RI/FS workplan submitted to regulatory agencies in November 1994. RI field investigation as defined in workplan completed in summer 1995. Presented preliminary data to BCT in June 1996. Initiated preparation of draft RI/RA report in June 1996.						

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
15	OU 5	Blue 10 Ordnance Disposal Area (10 acres)	1960s-1977	Small arms, parachute/distress flares, Mark IV signal cartridges, rocket ignitors, CADS, 5- and 2.75-inch rockets	Installation ordnance disposal operations	Ordnance disposal by combustion in a chamber with ashes being spread over the site.	2, 12, 25, 53
	Current Investigative Status: Preliminary surface water/sediment sampling completed. Preliminary surface water/sediment sampling completed. Final RI/FS workplan submitted to regulatory agencies in November 1994. RI field investigation as defined in workplan completed in summer 1995. Presented preliminary data to BCT in June 1996. Initiated preparation of draft RI/RA report in June 1996.						
16	OU 7	AIMD Seepage Pit (40 x 3 x 10 feet)	1960-1980	Solvents, heavy metals, acids, blasting grit, paint residue, photo wastes	Building 313, jet engine maintenance shop	Seepage pit used to drain wastewater (containing solvents, paint, grease, metals) generated from Building 313 operations into area soils; RCRA holding tank for wastewater is also located at Site 16; glass bead separator and associated piping also present.	2, 10, 12, 14, 15, 16, 19, 23, 24, 29, 38, 40, 41, 43, 58, 73, 74, 83, 84, 86
	Current Investigative Status: Field screening of soil and groundwater for VOCs completed. Field screening data submitted to regulatory agencies in April 1994 and received approval for installation of confirmation monitoring wells. Installation of permanent monitoring wells for confirmation program was completed in June 1994. Final RI submitted July 1995; FS submitted August 1995. Final BRA to be completed January 1996. Proposed plan submitted on March 19, 1996. A public meeting was held on March 21, 1996. Submitted draft Record of Decision in May 1996. Interim Action: Focused Feasibility Study and Remedial Design completed. Proposed Plan and public comment period completed. Final responsiveness summary and IROD submitted in March 1994. The removal and closure of the NDI Holding Tank was completed in May 1994. Final NDI Holding Tank Closure Certification and Report submitted September 1994.						
17	OU 2	Oil/Sludge Disposal Pit Southwest (2 acres)	Late 1960s - early 1970s	Waste fuels/oils	Fuel farm	Unlined shallow disposal pit	2, 5, 10, 12, 14, 15, 16, 19, 27, 33, 39, 46, 66, 67, 70, 71, 80
	Current Investigative Status: IROD signed in September 1994. IRA initiated in February 1995 for source removal, which is contaminated soil. IRA includes removal and on-site treatment of contaminated soil. Final RI and RA submitted May 1995; Final FS July 1995. Data indicate a potential human health risk if the groundwater of the surficial aquifer were used as a potable water source. Proposed Plan submitted and public meeting completed in July 1995. Final ROD submitted September 1995. Risk reduction remedial alternative is intrinsic bioremediation with an aggressive monitoring program. Groundwater remedial design workplan in progress.						

Table 3-24

NAS CECIL FIELD SITE DESCRIPTION CHART

Site Number	Operable Unit	Site Name/Size	Period of Operation	Waste Type	Sources	Description of Activity	Previous Reports
18	--	Ammunition Disposal Area (0.1 acre)	1950s	Ammunition crates, miscellaneous ordnance	Magazine area	Waste materials from a nearby magazine area were trucked in and dumped over the site during the 1940s until 1950. Reportedly, all munitions were removed. As of 7/93, live munitions were still present at the site according to EOD personnel.	2, 5, 56
	Current Investigative Status: Surface water/sediment sampling completed in summer 1993. Magnetometer survey completed October 1994 with 16 anomalies identified. Anomalies visually inspected and ordnance removed from all but one area within the site (spring and summer 1995). Field Investigation Workplan submitted March 1995. Field investigation to include monitoring well installation, surface and subsurface soil, surface water and sediment, and groundwater sampling. Field investigation activities scheduled for FY 1997, pending allocation of funds.						
19	--	Rowell Creek Rubble Disposal Area (3 acres)	Section until 1991	Concrete, construction debris, asphalt, wood debris, trash	Construction and operations	Limited information on disposal practices	5, 8, 56
	Current Investigative Status: Field Investigation Workplan submitted March 1995. Field investigation to include records and document search, geophysical surveys, monitoring well installation, surface and subsurface soil, surface water and sediment, and groundwater sampling. Field investigation activities scheduled for FY 1997, pending allocation of funds.						

Notes: -- = not currently identified as an operable unit

1) Hydrogeologic Assessment, G&M, 1983
2) IAS, Envirodyne Engineers/NEESA, July 1985
3) NAS Cecil Field Stormwater Master Plan, Southern Division, August 1986
4) Sampling of Potable Water Wells, G&M, 1986
5) RCRA Facility Investigation, Harding and Lawson, March 1988
6) Federal Facility Agreement, no date
7) NAS Cecil Field Master Plan, Southern Division, August 1989
8) PSC Screening Work Plan, ABB-ES, February 1991
9) Community Relations Plan, ABB-ES, July 1991
10) Work Plan for OUs 1, 2, and 7, ABB-ES, September 1991
11) Aquatic Sampling Report, ECT, February 1992
12) Work Plan for OUs 1, 2, and 7, ABB-ES, February 1992
13) RI/FS Data Validation Report, no date included
14) Preliminary Risk Assessment OUs 1, 2, 7, ABB-ES, May 1992
15) TM for Supplemental Sampling OUs 1, 2, 7, ABB-ES, September 1992

Table 3-24 (Cont.)

16) Human Health RA Methodology TM OUs 1, 2, 7, ABB-ES, September 1992
17) Site Management Plan, ABB-ES, October 1992
18) ARARs Handbook, ABB-ES, October 1992
19) Ecological RA Methodology TM OUs 1, 2, 7, ABB-ES, December 1992
20) Alternative Screening Report for OU 1, ABB-ES, February 1993
21) Letter Report to Cliff Casey, ABB-ES, May 1993 (Site 6)
22) Letter Report to Cliff Casey, ABB-ES, (Sites 21 and 22 - date not available)
23) Focused Feasibility Study for Source Control at OU 7, ABB-ES, August 1993
24) Remedial Design for Source Control at OU 7, ABB-ES, August 1993
25) Draft RI/FS Work Plan for OUs 3, 4, 5, 6, ABB-ES, May 1994
26) Focused Feasibility Study for Source Control at Site 11, OU 6, ABB-ES, October 1993
27) Treatability Study Workplan, Operable Unit 2, Sites 3, 5, 17 (includes Site 4), ABB-ES, December 1993
28) Letter from City of Jacksonville, Site 5 free product analyses, Jerry Young, October 1993
29) Final Design, Site 16, Interim Remedial Action, ABB-ES, November 1993
30) Final Design, Site 11, Interim Remedial Action, ABB-ES, April 1994
31) Petrex Soil Gas Survey, NAS Cecil Field, Site 4, Northeast Research Institute, Inc., June 1993
32) Draft Focused Feasibility Study Report, OU 2, Site 5, ABB-ES, April 1994
33) Final Focused Feasibility Study Report, OU 2, Site 17, ABB-ES, June 1994
34) Final Draft Interim Record of Decision, OU 6, Site 11, ABB-ES, May 1994
35) Draft Remedial Investigation Report, OU 1, Sites 1 and 2, ABB-ES, March 1994
36) Draft Baseline Risk Assessment Report, OU 1, Sites 1 and 2, ABB-ES, March 1994
37) Draft Feasibility Study Report, OU 1, Sites 1 and 2, ABB-ES, March 1994
38) Draft NDI Holding Tank Closure Certification and Report, OU 7, Site 16, ABB-ES, June 1994
39) Draft Proposed Plan, OU 2, Site 17, ABB-ES, June 1994
40) Final IROD and Responsiveness Summary, OU 7, Site 16, ABB-ES, March 1994
41) Technical Memorandum, Selection of Monitoring Well Locations, OU 7, Site 16, ABB-ES, April 1994
42) Draft Environmental Baseline Survey, ABB-ES, June 1994
43) Feasibility Study, OU 7, ABB-ES, August 1994
44) Final NDI Holding Tank Closure Certification and Report, ABB-ES, September 1994
45) Interim Record of Decision, Site 5, OU2, ABB-ES, September 1994
46) Interim Record of Decision, Site 17, OU 2, ABB-ES, September 1994
47) BRAC Environmental Baseline Survey, ABB-ES, November 1994
48) Final Remedial Investigation, OU 1, ABB-ES, December 1994
49) Final Risk Assessment, OU 1, ABB-ES, December 1994
50) Final Feasibility Study, OU 1, ABB-ES, December 1994
51) Draft Feasibility Study, OU 2, ABB-ES, December 1994
52) Final Environmental Baseline Study, ABB-ES, January 1995
53) Technical Memorandum, OU 5 Confirmatory Sampling, ABB-ES, January 1995
54) BRAC Cleanup Plan, ABB-ES, March 1995
55) Draft EBS Addenda to the BCT for OLF Whitehouse, Palatka Radar Site, and the Jet Fuel Pipeline, ABB-ES, March 1995
56) Field Investigation Plan, Potential Sources of Contamination (PSC), ABB-ES, March 1995
57) Draft Remedial Investigation, Operable Unit 7, ABB-ES, March 1995
58) Draft Baseline Risk Assessment, Operable Unit 7, ABB-ES, March 1995
59) Draft Proposed Plan for Remedial Action, Naval Air Station Cecil Field Operable Unit 1, Old and Recent Landfills, ABB-ES, March 1995
60) Proposed Plan for Remedial Action, Operable Unit 1, Old and Recent Landfills, April 1995

Table 3-24 (Cont.)

61) Draft Feasibility Study Operable Unit 7, ABB-ES, April 1995
62) Draft Remedial Investigation, Operable Unit 8, ABB-ES, April 1995
63) Draft Baseline Risk Assessment, Operable Unit 8, ABB-ES, April 1995
64) Final Design, Site 5 Bioremediation, ABB-ES, April 1995
65) Draft Feasibility Study, Operable Unit 8, ABB-ES, May 1995
66) Final Remedial Investigation, Operable Unit 2, ABB-ES, May 1995
67) Final Baseline Risk Assessment, Operable Unit 2, ABB-ES, May 1995
68) Technical Memorandum, Operable Unit 5 Confirmatory Sampling, ABB-ES, June 1995
69) Draft Proposed Plan for Remedial Action, Operable Unit 2, June 1995
70) Final Feasibility Study, Operable Unit 2, ABB-ES, July 1995
71) Proposed Plan for Remedial Action for Operable Unit 2, July 1995
72) Draft Record of Decision, Operable Unit 1, ABB-ES, July 1995
73) Final Remedial Investigation Report, Operable Unit 7, ABB-ES, July 1995
74) Feasibility Study Operable Unit 7, ABB-ES, August 1995
75) Technical Memorandum, Operable Unit 6, Site 11 Revisions to Sample Locations, ABB-ES, August 1995
76) BRAC Environmental Baseline Survey Report, Addendum A, Outlying Landing Field Whitehouse, ABB-ES, August 1995
76a) BRAC Environmental Baseline Survey Report, Addendum B, Palatka Radar Site, ABB-ES, August, 1995
77) BRAC Environmental Baseline Survey Report, Addendum C, 103rd Street Jet Fuel Pipeline, ABB-ES, August 1995
78) Draft Record of Decision, OU 2, ABB-ES, August 1995
79) Final Record of Decision, OU 1, ABB-ES, September 1995
80) Final Record of Decision, OU 2, ABB-ES, September 1995
81) Final design, OU 1, April 1996
82) Final RI Report, OU 8, February 1996
83) Final Risk Assessment Report, OU 7 (Site 16), January 1996
84) Final Proposed Plan, OU 7, Site 16, March 1996
85) Treatability Study Report, Site 5, March 1996
86) Draft OU 7 Record of Decision, May 1996
87) Draft OU 4 RI Report, June 1996

Source: Routhier 1996.

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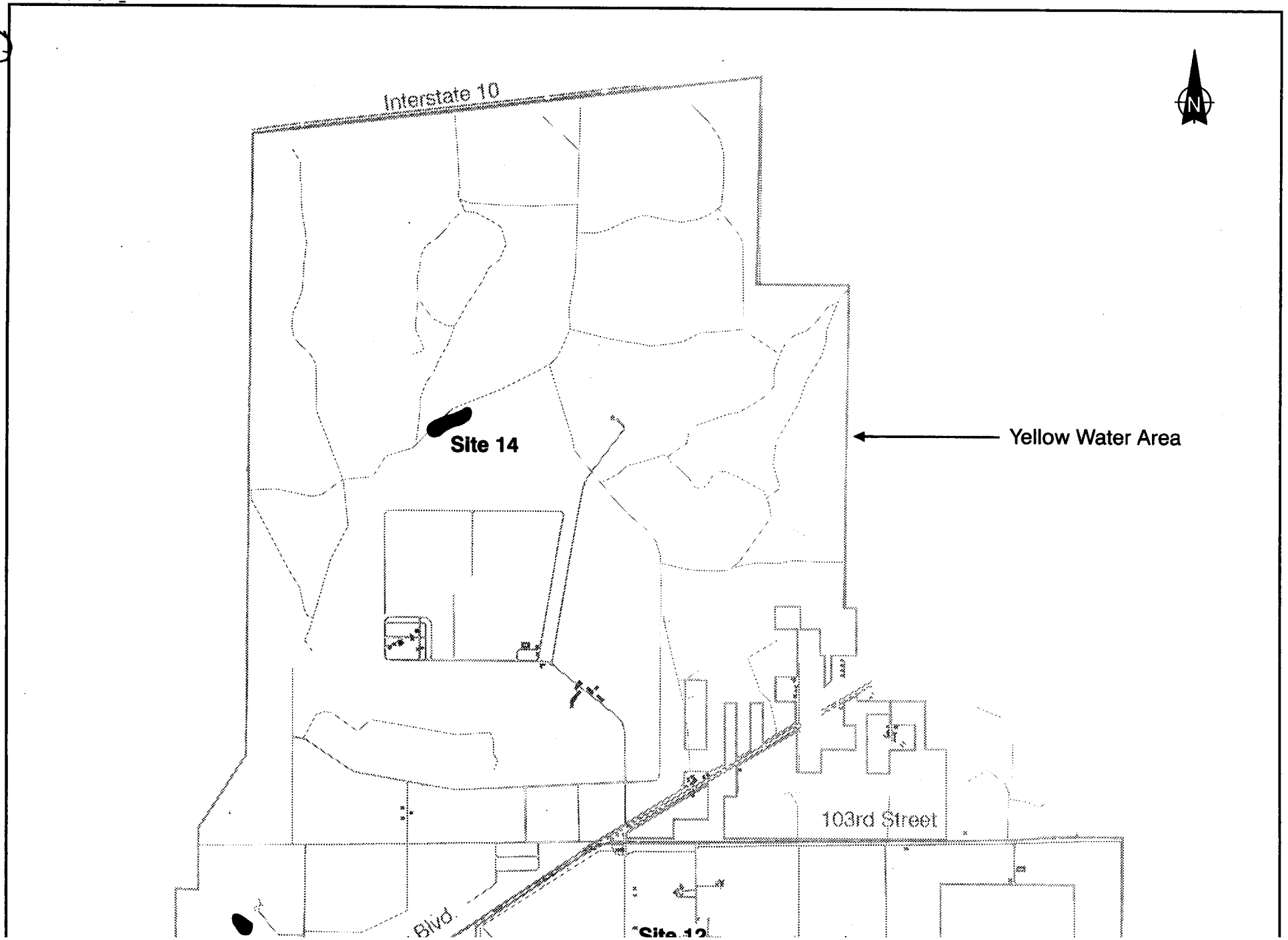
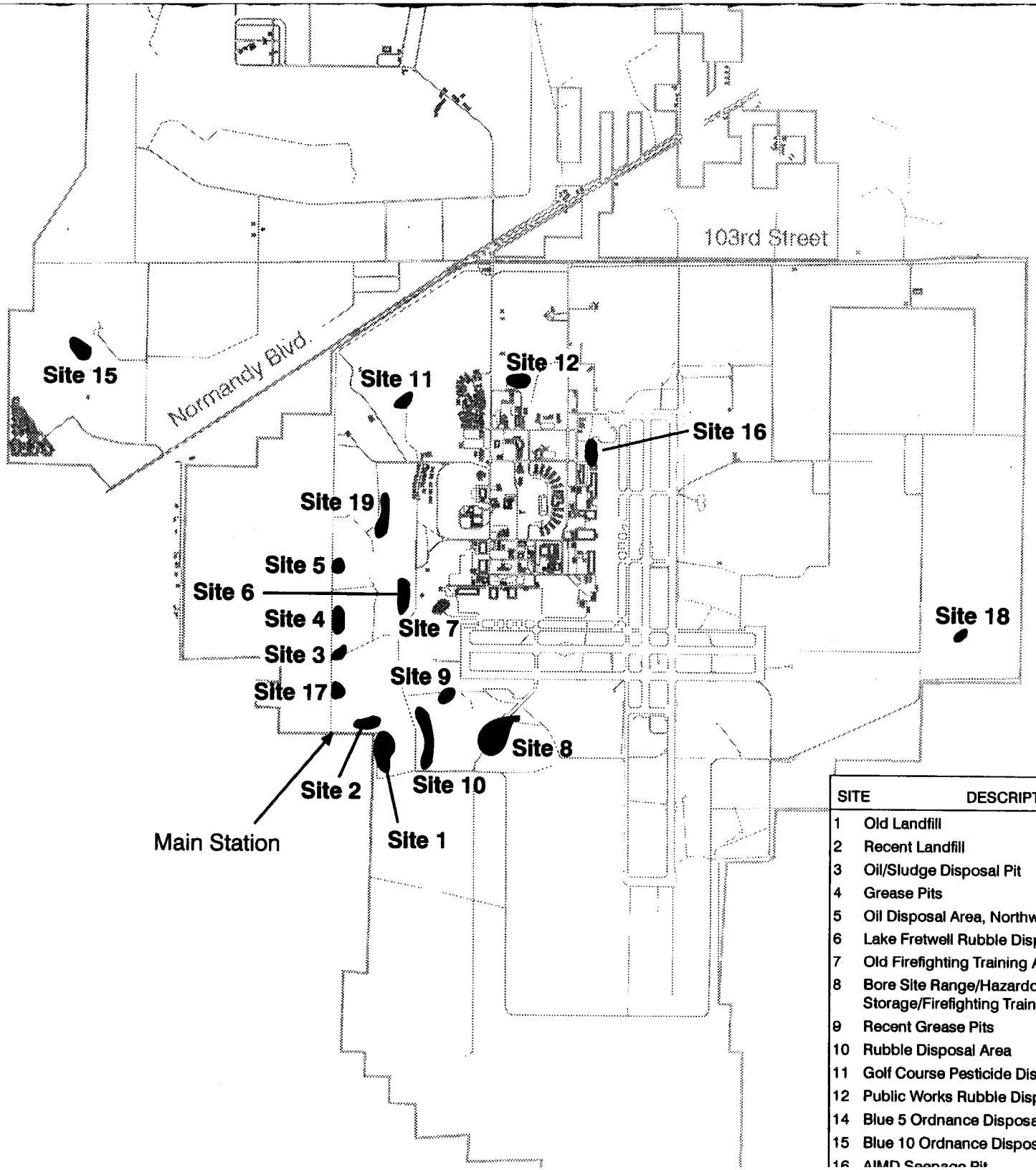




SITE	DESCRIPTION
1	Old Landfill
2	Recent Landfill
3	Oil/Sludge Disposal Pit
4	Grease Pits
5	Oil Disposal Area, Northwest
6	Lake Fretwell Rubble Disposal Area
7	Old Firefighting Training Area
8	Bore Site Range/Hazardous Waste Firefighting Storage/Firefighting Training Area
9	Recent Grease Pits
10	Rubble Disposal Area
11	Golf Course Pesticide Disposal Area
12	Public Works Rubble Disposal Area
14	Blue 5 Ordnance Disposal Area
15	Blue 10 Ordnance Disposal Area
16	AIMD Seepage Pit

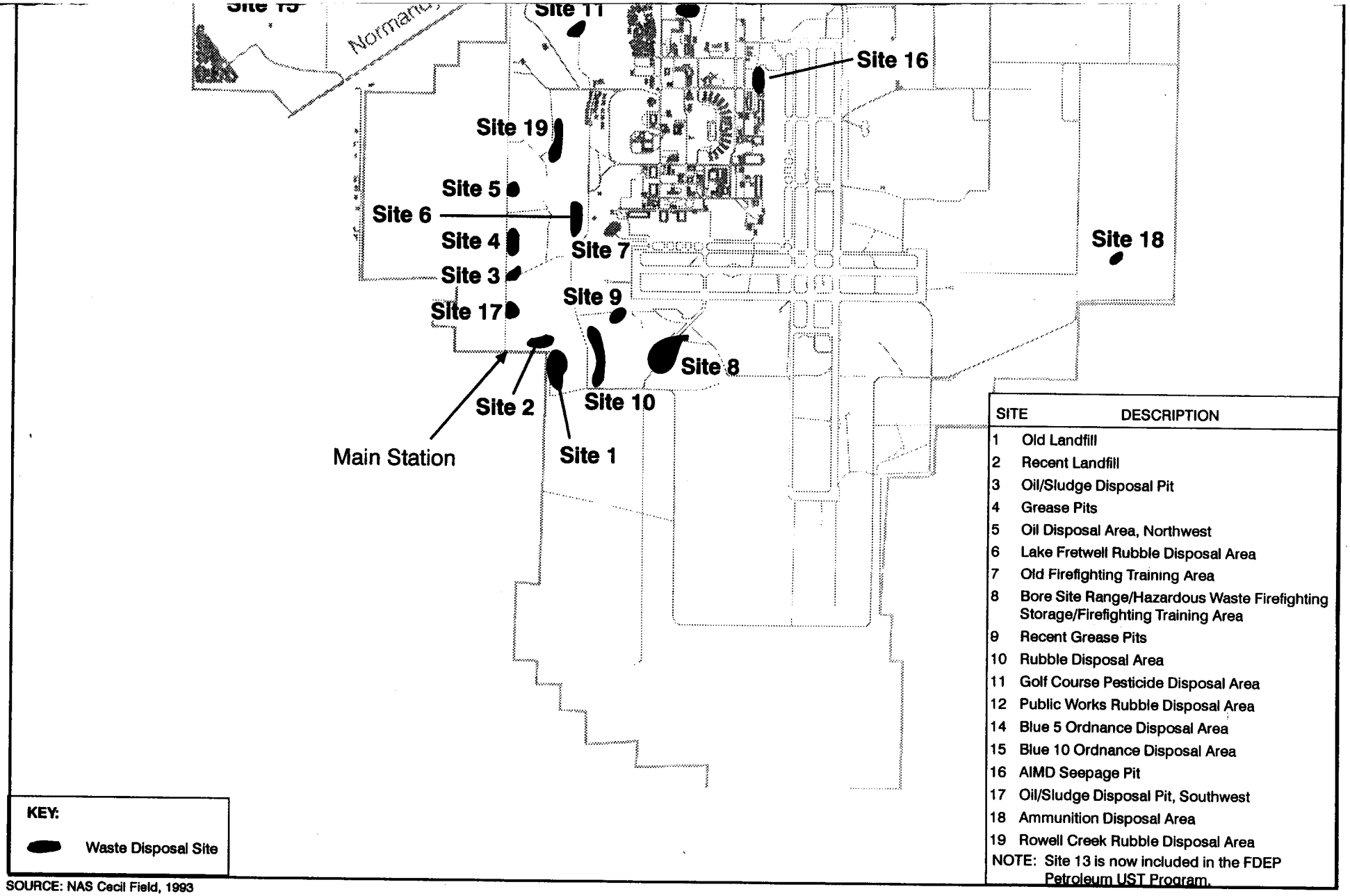


Figure 3-26 IRP SITES AT NAS CECIL FIELD

Table 3-25

ORIGINAL 16 AREAS OF INTEREST DESCRIPTIONS
NAS CECIL FIELD

AOI Number	Site Name	Period of Operation	Waste Type	Sources	Description of Activity	Current Investigative Status
AOI-20	Hazardous Waste Storage Facility	1981-1985	Hazardous waste drums	Facility	Concrete pad used to store drums. Pad full of cracks. No documented spills.	Field activities in planning stage.
AOI-21	Golf Course Maintenance Area, near Building 238	Unknown	Pesticides	Golf Course Maintenance Department	Trucks and spray equipment for the distribution of pesticides on the golf course were rinsed on a concrete pad. Wash water was allowed to drain into the golf course tributary of Rowell Creek.	Seven surface soil samples and three sediment samples were collected (1992). Sediments were sampled (1993) to support the evaluation of inputs to Rowell Creek drainage.
AOI-22	Golf Course Fairway 7 Area	Unknown	Pesticides and solid waste	Golf Course Maintenance Department and other unknown sources.	Debris such as 30- and 55-gallon drums, scrap metal, concrete rubble, tin cans, etc., is visible on the surface.	Three surface soil samples and three sediment samples were collected. Geophysical investigations are underway.
AOI-23	Aviation Ordnance Area (AVORD) Site	Unknown	Ordnance	—	—	Field activities in progress.
AOI-24	AVORD Pistol Range site	Unknown	Unknown	—	Partially full hazardous waste drums found and removed.	Field activities in planning stage.
AOI-25	Building 81 Transformer Storage Yard	Unknown	PCB oils	—	Several hundred transformers are currently stored on the ground surface at this site. Some 55-gallon drums labeled "PCB solids" are present.	Site screening scheduled for 1996.
AOI-26	Building 81 Dichlorodiphenyl-trichloroethene (DDT) Site	Unknown	DDT and pesticides	Building 81 operations	Building 81 is a pesticide storage building. Very little DDT mixing done at site.	Site screening scheduled for 1996.
AOI-27	Building 81 HAZMAT shed	Unknown	Unknown	Unknown	Site consists of a concrete pad with a roof constructed to facilitate runoff.	Site screening scheduled for 1996.
AOI-28	North TCP Site	Unknown	Solvents	Hazardous material storage	Storage of hazardous materials and evidence of stressed vegetation.	Site screening complete in 1996. Removal action required.

Table 3-25

ORIGINAL 16 AREAS OF INTEREST DESCRIPTIONS
NAS CECIL FIELD

AOI Number	Site Name	Period of Operation	Waste Type	Sources	Description of Activity	Current Investigative Status
AOI-29	Building 313 TCP Site	Unknown	Solvents	Hazardous material storage	Storage of hazardous materials and evidence of stressed vegetation.	Site screening scheduled for 1996.
AOI-30	Building 313 (East by Power Plant)	Unknown	Solvents	Suspect dumping	Stressed vegetation found, suspect solvent dumping over fence and behind buildings and lockers.	Site screening scheduled for 1996.
AOI-31	South TCP Site	Unknown	Solvents	Hazardous material storage	Temporary collection point at west end of east to west flightline.	Site screening scheduled for 1996.
AOI-32	Supply Building 335 HAZMAT Storage Area	Unknown	Solvents	Hazardous material storage	Used for new material storage. Part grassy area, part asphalt. Found empty solvent drums.	Site screening complete in 1996. No further action recommended.
AOI-33	DRMO Storage Area	Unknown	Solvents, paints, pesticides, and metals	Storage	Storage of materials prior to disposal or resale.	Site screening complete in 1996. Removal action required.
AOI-34	Rowell Creek Ordnance Disposal Area	Unknown	Ordnance	Dumping	Suspect ordnance thrown off each side of Perimeter Road bridge between Sites 1 and 10.	Unexploded ordnance. Survey and excavation complete in summer 1995.
AOI-35	PCBs on Perimeter Road	Unknown	PCBs	—	PCB-contaminated oil was reportedly used to keep the dust down on Perimeter Road.	Field activities in planning stage.

Key:

AOI = Area of Interest.
DDT = Dichlorodiphenyl trichloroethene.
DRMO = Defense Reutilization and Marketing Office.
HAZMAT = Hazardous materials.
PCBs = Polychlorinated biphenyls.
TCP = Temporary Collection Point.

Source: ABB-ES 1996.

As of January 1995, 33 buildings/parcels at NAS Cecil Field were coded yellow; 48 were coded red; and 217 were coded grey. (AOIs identified through the EBS are presented in Appendix E.) However, the total land area occupied by these AOIs represents only 7% of the land area at NAS Cecil Field.

3.11.3 Storage Tanks and Pipelines

Petroleum products used at NAS Cecil Field include aviation fuels, motor fuels, oils, heating fuel, lubricants, and hydraulic fluids. The largest petroleum product used is aviation fuel, which is brought to NAS Cecil Field through a 15-mile long pipeline parallel to 103rd Street from NAS Jacksonville and is stored at the North Fuel Farm (NFF), which consists of six 595,000-gallon bulk storage tanks. The pipeline system extends from the NFF to the operations area near the flightline, where fuel is stored in two 210,000-gallon day tanks, two high speed refueling pits, and an underground storage tank (UST) serving the Jet Engine Test Cell (ABB-ES 1994). This aviation fuel pipeline and storage system is scheduled to be closed as part of the closure of the station, however, it will not be disposed to other entities for reuse. Contamination associated with these facilities is currently being investigated and further actions, if necessary, will be the subject of BRAC cleanup activities at the station.

The 103rd Street pipeline was the subject of an EBS completed in 1995. The pipeline has undergone previous testing for structural integrity. A pig, a device that determines pipe wall thickness, was run through the entire line and indicated a number of anomalies (i.e., areas where the pipe wall thickness was below a minimum required thickness). The only known release from the pipeline occurred at a single off-station property along the pipeline route. This property was acquired by the Navy in 1996 and the residents were relocated. The property was transferred to NAS Jacksonville to facilitate remediation activities and future monitoring. A single family home on site was razed and soil remediation has been completed. Groundwater at the site will be monitored.

In 1981, the Day Tank 1 ruptured and 500,000 gallons were lost. In addition, the UST serving the Jet Engine Test Cell was discovered to be leaking in 1989. Repairs were made to each tank and both are now cleanup sites requiring soil and groundwater cleanup. Remediation is scheduled to begin in FY 1997.

A total of 162 USTs and 54 ASTs were assessed at NAS Cecil Field during the EBS, and subsequently, in the Tank Management Plan. Of the 162 USTs, 120 have been removed; and of the 54 ASTs, 15 have been removed (Routhier 1995). The EBS determined the compliance status of each tank and whether there was any evidence of a release of petroleum products. Sites under investigation as a result of known releases are provided on Table 3-26.

The EPA has delegated the responsibility for USTs/ASTs to the FDEP; therefore, UST/AST compliance and closure activities at NAS Cecil Field are being conducted in compliance with FAC Chapter 62-770. The Navy and the State of Florida have signed an agreement extending the regulatory deadline for bringing all USTs and ASTs at NAS Cecil Field into compliance until 1999 (ABB-ES 1995).

3.11.4 Lead and Copper in Drinking Water

In 1993, the Navy performed a survey of the NAS Cecil Field potable water distribution system and a statistical selection of facility taps was sampled. The samples were analyzed for lead and copper. Lead concentrations were detected from 0.000504 milligrams per liter (mg/L) to 0.01101 mg/L, and copper concentrations were detected from 0.030 mg/L to 1.158 mg/L. All of the samples fall below the EPA and FDEP action levels for lead (0.015) and copper (1.3 mg/L) (ABB-ES 1994).

3.11.5 Oil/Water Separators

Oil/water separators are process units located at various maintenance and fueling locations at the base. The separators are designed to remove oil, fuel, and grease from the wastewater effluent. The petroleum waste products are collected and disposed of off-site, and the wastewater is discharged to the sanitary sewer system and wastewater treatment plant (ABB-ES 1994). Fifteen oil/water separators were identified during the EBS and classified "grey." Further investigations are planned for these units (ABB-ES 1995).

3.11.6 Asbestos

Three asbestos surveys were performed at NAS Cecil Field between 1989 and 1993. A total of 342 buildings (including operational, support and residential housing units) were surveyed, representing approximately 66% of the buildings on base. Of the 342 buildings surveyed, 78 held asbestos-containing material (ACM), primarily as thermal system insulation. The surveys also documented whether the ACM was friable or nonfriable, and noted the condition of the material as damaged or undamaged (ABB-ES 1994). An Asbestos Management Plan has been prepared for the removal and repair of damaged, friable ACM.

Table 3-26

TANK INVESTIGATION PROGRAM SITES
NAS CECIL FIELD

Location	Year of Release	Release Quantity (gallons)	Type of Fuel	Actions to Date
North Fuel Farm	1985	2,200	JP-5	See North Fuel Farm, Tank 76-E.
North Fuel Farm	August 1987	22,772	JP-5	See North Fuel Farm, Tank 76-E.
North Fuel Farm	February 1991	913,000	JP-5	See North Fuel Farm, Tank 76-E.
North Fuel Farm, Tank 76-E	November 1993	1,800	JP-5	CA completed at the site. RAP completed in FY 1995.
Truck Stand (Facility 372)	December 1990	—	JP-5	CA completed. CAR submitted in May 1992. CAR addendum submitted July 1994.
South Fuel Farm	July 1991	—	—	CA completed in July 1991. CAR submitted in July 1992. All USTs except Day Tank 2 removed in July 1994. Excavated soil returned to the excavated pit.
Jet Engine Test Cell Facility (Facilities 334, 339, 328, and 811)	October 1989	Failed precision fitness testing	JP-5	Numerous leaks in the past. CAR submitted in March 1994. CAR addendum submitted in November 1994. RAP submitted in FY 95.
NAS Jacksonville - NAS Cecil Field Jet Fuel Pipeline	July 1989	Unknown	JP-5	CA began in 1989. CAR filed in May 1990. RAP submitted August 1991. Remedial actions began in 1995.
Helicopter Crash Site	February 1992	1,800	JP-5	PCAR submitted in January 1994. CAR submitted in FY 95.
S-3 Crash Site	December 1991	Unknown	—	IRA completed in August 1994.

Key:

CA = Contamination Assessment.
CAR = Contamination Assessment Report.
FY = Fiscal year.
IRA = Interim Remedial Action.
PCAR = Preliminary Contamination Assessment Report.
RAP = Remedial Action Plan.
UST = Underground storage tank.
— = Unknown

Source: ABB-ES 1995.

3.11.7 Lead-Based Paint

A Lead-Based Paint (LBP) Management Plan was prepared for NAS Cecil Field in October 1995. The LBP Management Plan contains the findings, observations, and a composite of information collected during a site investigation performed at NAS Cecil Field in November and December 1994. Fieldwork was performed on a Phase I or observational (nonintrusive) basis. In addition to the Phase I survey, a comprehensive surface by surface LBP investigation of target housing and community facilities was conducted in April/May 1995. Results of the comprehensive investigation are included in an Addendum to the LBP Management Plan (Navy 1995).

The objectives of the LBP Management Plan were:

- To offer a comprehensive and well-documented assessment of the potential LBP usage at selected facilities;
- To collect the information needed to structure an accurate estimation of a recommended in place LBP management program and associated costs;
- To qualify and quantify potentially affected surface areas to assist in the cost estimation on a surface by surface basis, in the event that encapsulation or abatement is necessary;
- To identify areas of immediate health risks of human exposure to LBP;
- To offer recommendations in establishing appropriate corrective actions to reduce existing hazards; and
- To offer a management plan for the inspected surfaces, with respect to federal, state, and local regulations.

By federal regulation and DoD policy, target housing is required to be physically tested for LBP hazard identification. Other facilities, such as community and recreational areas (where children are likely to frequent), were also included in the survey. A total of 173 pre-1978 facilities were selected for physical testing. Results of the investigation are presented in the Addendum to the LBP Management Plan on a building by building basis.

3.11.8 Polychlorinated Biphenyls

Transformers known to contain dielectric fluids with polychlorinated biphenyl (PCB) concentrations exceeding 500 parts per million (ppm) have either been removed or drained

and refilled by the Public Works Center at NAS Jacksonville under a program begun in 1986. All removal and replacements were completed in FY 1995 (ABB-ES 1995).

Two AOIs involving PCBs have been identified at NAS Cecil Field. AOI 25 is the Building 81 Transformer Storage Yard. This area contains abandoned transformers and electrical equipment, and may contain PCB-laden dielectric fluid. AOI 35 is Perimeter Road. Oil that may have contained PCBs was reportedly applied to unimproved sections of Perimeter Road to contain dust emissions (ABB-ES 1994). Information on these AOI sites is provided in Table 3-25.

3.11.9 Pesticides

Pesticides were reportedly used throughout NAS Cecil Field since its construction in 1941. However, the most concentrated use of pesticides occurred at the golf course, which has resulted in the discovery of one IRP site (IRP Site 11) where pesticide containers were buried, and two AOIs (AOI 21 and 22). AOI 21 is a pesticide applicators rinse area, and AOI 22 is a disposal site (ABB-ES 1994).

Another AOI (AOI 26) has been identified surrounding the former pesticide storage building. Pesticides, including DDT, were reportedly stored in this room until the construction of Building 101 in 1975 (ABB-ES 1994). Information on the IRP sites and AOIs is provided in Tables 3-24 and 3-25, respectively.

3.11.10 Medical and Biohazardous Waste

The only known building on the installation reported to generate biohazardous waste is the Dispensary, Dental, and Medical Clinic (Building 808). Biohazardous waste is handled by a certified contractor. The waste is shredded and heat-treated prior to disposal in sanitary landfill facilities (Routhier 1996). Over the past 10 years, the biohazardous waste has been managed by various certified contractors using similar handling protocols.

An aboveground collection tank, used to filter dental suction, is also associated with this building. Solids in the tank and liquids are routed to the station's sanitary sewer system (ABB-ES 1994).

3.11.11 Ordnance

A Draft Unexploded Ordnance (UXO) Survey Report was prepared in August 1996. The Draft UXO Report documents the UXO surveys conducted at NAS Cecil Field as part of the BRAC program. Geophysical surveys were conducted at the Rowell Creek Ordnance

Disposal Area, identified as AOI 34, and at the Ammunition Disposal Area, identified as IRP Site 18, during November and December 1994. Between April and December 1995, 11 locations in the Yellow Water Area were surveyed for residual UXO. Excavation of suspect areas identified by the surveys was undertaken by Navy personnel.

The UXO survey at AOI 34 resulted in the identification and excavation of 21 subsurface anomalies. Items recovered included chain-link fencing, reinforced concrete, scrap metal, and an assortment of construction debris. With the exception of one MK24 flare found in the creek bed, no ordnance was found.

The UXO survey at IRP 18 resulted in the identification and excavation of 16 subsurface anomalies. Two hundred and thirty-one ordnance items were recovered including 150 20-millimeter rounds, 76 2.75 rocket warheads, two unknown cartridges, one flare, one MK4 cartridge, and one 50-caliber round. The area beneath the bridge was not excavated at that time due to high water levels. This ordnance will be excavated when the water level in the creek lowers. All ordnance items were turned over to base EOD authorities for disposal.

The UXO survey at the Yellow Water Area encompassed 11 areas totaling 333 acres. The particular areas surveyed were predetermined by qualified ordnance personnel to be the areas most likely to contain residual UXO. This determination was made from historical drawings, old aerial photographs, and interviews. In general, most observed and detected items consisted of inert ordnance explosive wastes (OEW). The OEW was collected and disposed of off base. Eighteen UXOs were detected, including 16 7.62-millimeter rounds and two 50-caliber rounds. This UXO was disposed of off base or detonated at IRP Site 14.

In August 1996, the station's BRAC Cleanup Team made the decision that no further UXO surveys will be conducted at Yellow Water Area. This decision was based on the limited discovery of live ordnance found over the 333 surveyed acres. Therefore, based on current information, no property will be categorized as nontransferable solely due to suspicion of UXO.

3.11.12 Radioactive Materials and Mixed Wastes

A radiological scoping survey was conducted within the boundaries of the Yellow Water Area in the fall of 1994. The radiological scoping survey included collecting surface soil samples, samples of removable contamination and direct radiation readings to assess the nature and level of residual radioactive contamination in and around structures in the Yellow Water Weapons Command (YWWC). The survey techniques employed were those recommended in the "Manual for Conducting Radiological Surveys in Support of License Termination" (NUREG/CR-5849) (Navy 1994).

A radiological history was obtained through interviews with Navy personnel assigned to the weapons compound within the Yellow Water Area and the Radiological Affairs Office at NAS Jacksonville. The historical storage of nuclear weapons could neither be confirmed nor denied, based on interviews. The results of the surveys show that even though it was likely that the weapons compound was used to store, handle, and maintain nuclear weapons, site activities did not cause or create any significant radiological hazard or leave residual contamination. The results of the survey were documented in a report in February 1995.

State and EPA remedial project managers assigned to NAS Cecil Field were continuously informed of survey protocols and sampling results. Surveys were conducted with adequate quality assurance and by qualified personnel. Instrument calibration records are included in the Radiological Scoping Survey Report. The Radiological Scoping Survey Report was submitted to the Navy's Radiological Affairs and Support Office (RASO) in May 1995. No approval or comments have been received to date.

3.11.13 Radon

The Navy Radon Assessment and Mitigation Program (NAVRAMP) was established to systematically evaluate radon gas concerns at Naval installations. A radon assessment was performed at NAS Cecil Field in 1989 at selected housing units in both the Yellow Water Area and Main Base housing developments (ASS-ES 1994).

Seventy-one of the 122 housing units on base, or approximately 60%, were tested for radon. The results of the testing indicated that no radon levels above the EPA action level (4.0 picocuries per liter [4 pCi/L]) were present at NAS Cecil Field. The highest radon gas level in the survey was 1.0 pCi/L (one result). All of the other test results were less than 1.0 pCi/L, and approximately 50% of the samples (34 results) were below the analytical detection limit of 0.5 pCi/L (ABB-ES 1994).

3.11.14 Adjacent Properties

Adjacent properties were surveyed in the EBS to identify whether any potential contamination on those properties could impact NAS Cecil Field. The EBS classified adjacent properties as either having no known or suspected releases or having known or suspected releases. A records search was conducted of all properties within a 2-mile radius of NAS Cecil Field. Nineteen sites were identified based on various environmental records such as USTs notification, hazardous waste generator permits, and state listed hazardous waste sites (ABB-ES 1994).

Five properties have known or suspected releases of contaminants to the environment. The five properties include Sandler Road Landfill (0.8 mile east of NAS Cecil Field); Shadrach Phillips (0.5 mile northeast); Lil Champ Food Store on Normandy Boulevard (0.9 mile west); Lil Champ Food Store on W. Beaver Street (1.8 mile northeast); and River Bus Sales (2.0 mile northeast). The Sandler Road Landfill and Shadrach Phillips are state-listed hazardous waste sites. The Lil Champ Food Store on Normandy Boulevard and River Bus Sales are listed for having possible groundwater contamination from leaking USTs, and the Lil Champ Food Store on W. Beaver Street is listed for possible soil contamination from leaking USTs (ABB-ES 1994).

4 Environmental Consequences and Mitigative Measures

This section evaluates the potential environmental impacts of the reuse of NAS Cecil Field pursuant to the Preferred Reuse Plan and the four ARSs. In addition, mitigation measures to avoid or lessen potential environmental impacts are presented. Because most potential environmental impacts would result directly from reuse of the property by other entities, the Navy will not be responsible for implementing mitigation measures following disposal of the property, other than remediation of environmental contamination associated with past station activities. Full responsibility for implementing these suggested measures would be borne primarily by the ultimate receiving entity and enforced by federal, state, and local regulatory agencies. Cumulative impacts, or those that could result from the incremental impact of the proposed action when added to other past, present, and future actions, are also identified. Descriptions of the Preferred Reuse Plan and ARSs are presented in Section 2 of this DEIS.

4.1 Land Use and Aesthetics

The potential land use effects of the Preferred Reuse Plan and each ARS were evaluated according to: whether existing development constraints at the station would significantly impede the realization of each plan; whether each plan would result in on-site conflicts arising from inconsistent/incompatible land uses; and whether each plan would result in conflicts with existing or future land uses adjacent to the station property.

On-site development constraints were derived from information presented in Section 3 and include:

- Wetlands;
- Areas within the 100-year floodplain;
- Areas of potential archaeological sensitivity;

- Habitats of species of concern (i.e., threatened, endangered, and candidate species); and

- Environmentally contaminated areas that would likely require remediation (i.e., categories 4, 5, and 6 from the Environmental Baseline Survey of the Station).

The Preferred Reuse Plan and each ARS were reviewed using GIS analysis to determine areas without significant development constraints. Within land use categories under each of the plans, acreages with no constraints were multiplied by applicable FARs to determine new development that would be permitted (i.e., in square feet of building area). These estimates were then compared to the CFDC's projections for new development through 2010 to determine whether each plan, at least at a macro level, could be reasonably implemented without affecting environmentally sensitive areas. It should be noted that areas containing soils with low development suitability were excluded from the analysis because they coincided with wetland areas at the station.

For internal and external land use consistency assessments of the Preferred Reuse Plan and the ARSs, qualitative analysis was conducted using existing land development information and future land use projections contained in the Land Use Element of the *Jacksonville Comprehensive Plan* (Jacksonville Planning and Development Department 1990).

4.1.1 Preferred Reuse Plan

Implementation of the Preferred Reuse Plan would involve major, long-term changes to existing land use patterns, development controls, and ownership. This plan identifies seven major land use categories at the station totaling 17,202 acres including general aviation, aviation-related services, industrial, forestry, commercial, parks and recreation, and conservation. (The land use plan for the Preferred Reuse Plan is illustrated in Figure 2-1.)

Development Constraint Analysis

Figure 4-1 depicts the Preferred Reuse Plan and land areas exhibiting known development constraints. Although significant areas of the station are constrained for future development activities by features such as wetlands and habitats of species of concern, the station still contains large parcels that could reasonably support new development. Table 4-1 presents an analysis of the station's development potential, if development occurred only on areas without documented constraints, and used the FAR standards established in the CFDC's Base Reuse Plan (CFDC 1996). As shown, not only can the development anticipated to 2010

Table 4-1

CONSTRAINED LAND AREAS AND DEVELOPMENT POTENTIAL FOR THE PREFERRED REUSE PLAN

Land Use	Area Devoted to Land Use (Acres)	Area with Constraints (Acres)[a]	Area with No Constraints (Acres)	Floor Area Ratio (FAR)[b]	Permitted Development Potential (sq. feet)[c]	Planned New Development to 2010 (sq. feet)[b]	Additional Development Potential (sq. feet)[d]
Conservation	641	296	345	NA	NA	NA	NA
Forestry	2,835	1,615	1,220	NA	NA	NA	NA
Forestry/Airport Reserve	4,081	2,777	1,304	NA	NA	NA	NA
Parks and Recreation	2,943	1,332	1,611	NA	NA	NA	NA
General Aviation	1,566	1,142	424	NA	NA	NA	NA
Aviation-Related Services	445	103	342	0.50	7,448,760	0	7,448,760
Commercial	207	25	182	0.30	2,378,376	100,000	2,278,376
Light Industrial	3,455	1,151	2,304	0.15	15,054,336	2,500,000	12,554,336
Heavy Industrial	1,029	313	716	0.15	4,678,344	1,250,000	3,428,344
Total	17,202	8,754	8,448	NA	29,559,816	3,850,000	25,709,816

[a] Land areas containing at least one of the following constraints: wetlands, floodplains, habitats of species of concern, potentially archaeologically sensitive areas, or environmentally contaminated areas.

[b] As proposed in the *Cecil Field Final Base Reuse Plan* (CFDC 1996).

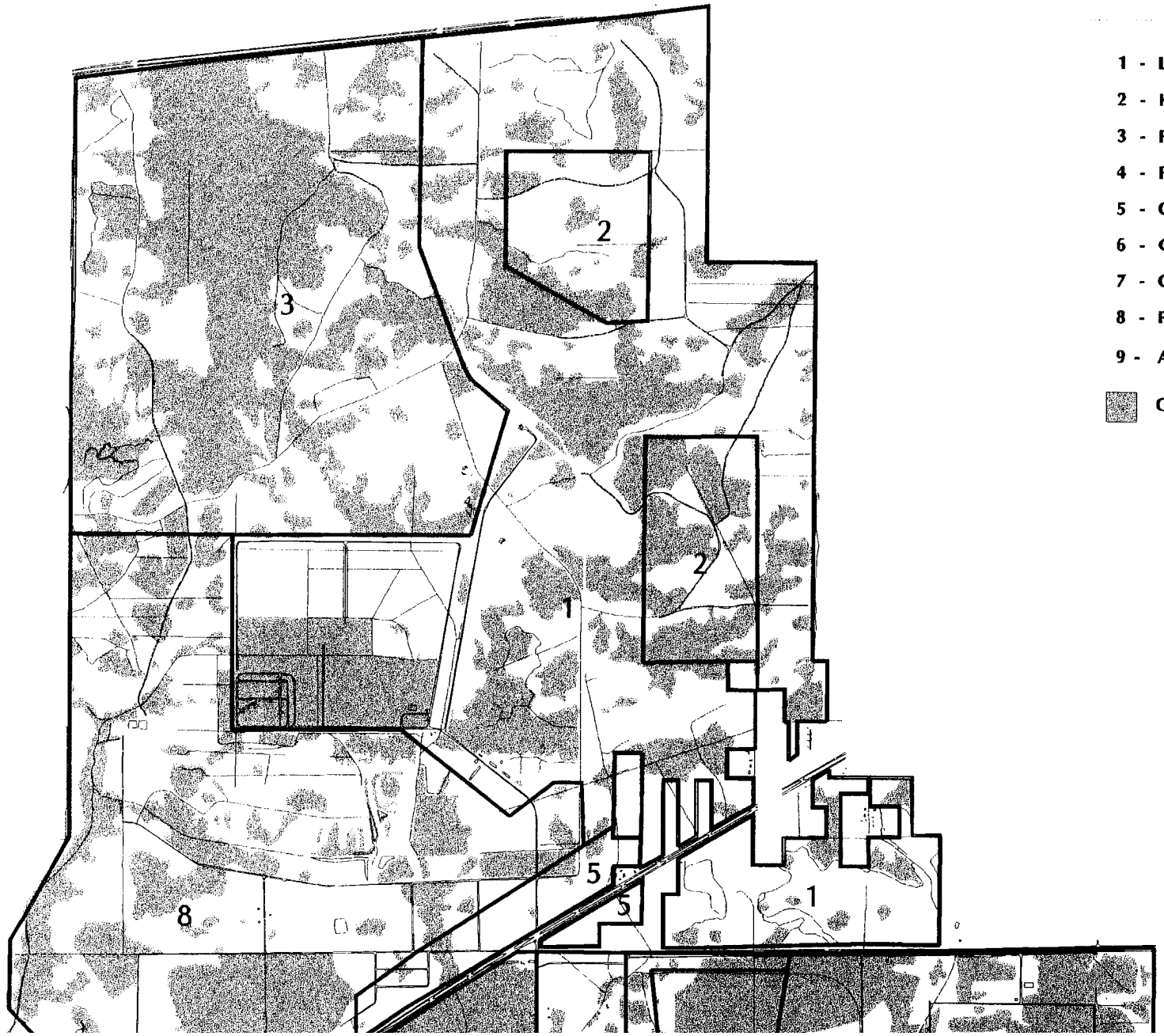
[c] Permitted development potential calculated by multiplying the floor area ratio by the land area without development constraints (i.e., converted into square feet).

[d] Additional development potential calculated by subtracting planned development to 2010 from permitted development potential.

Key:

NA = Not applicable; no buildings would be developed in these areas.

Source: Ecology and Environment, Inc., 1996.


LEGEND
1 - Light Industrial
2 - Heavy Industrial
3 - Forestry
4 - Forestry/Airport Reserve
5 - Commercial
6 - General Aviation
7 - Conservation
8 - Parks and Recreation
9 - Aviation-Related Services
Constrained Land Areas
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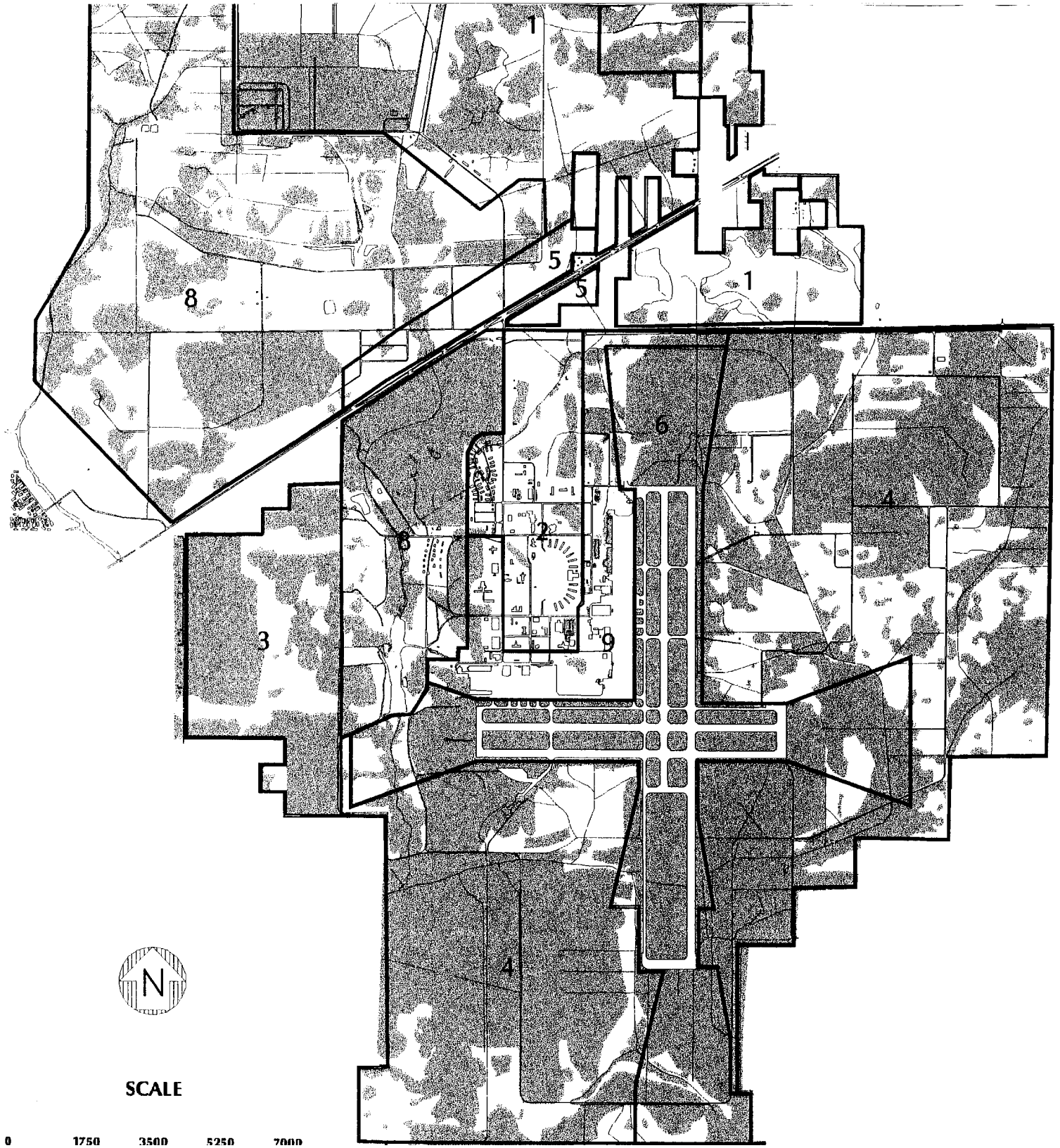
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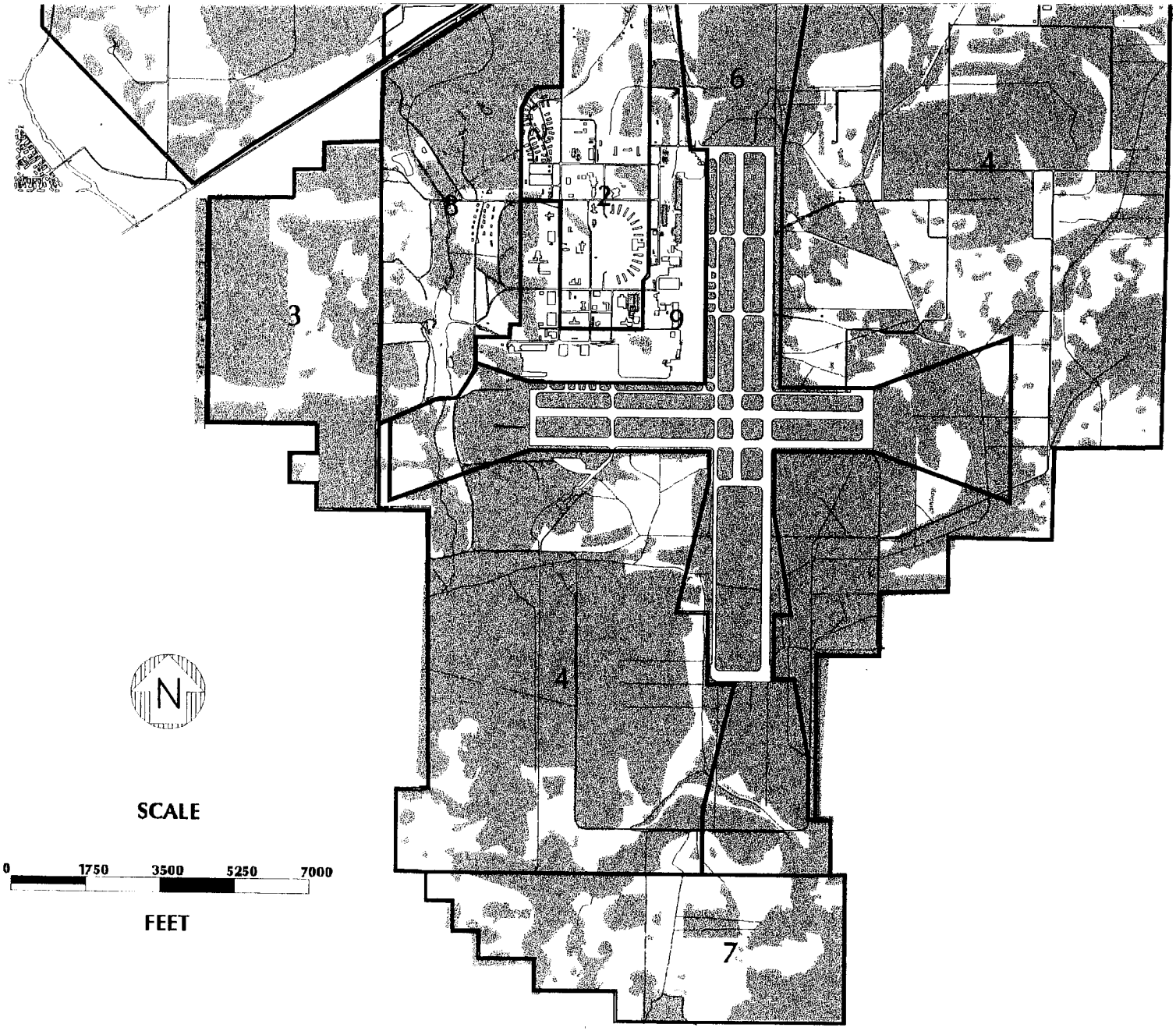


Source: CFDC 1996; Ecology and Environment, Inc. 1996

(3)

Figure 4-1 PREFERRED REUSE PLAN : CONSTRAINED LAND AREAS

be accommodated on unconstrained areas of the station, a significant amount of additional development could be realized without affecting environmentally sensitive features. Based upon market analysis, the CFDC projects that approximately 3.9 million square feet of new development could occur by 2010 under the Preferred Reuse Plan. However, permitted development on unconstrained land areas would total over 29 million square feet using the CFDC's FAR standards. Therefore, projected development under the Preferred Reuse Plan could be implemented without significantly affecting constrained areas.

Notwithstanding, the specific components of an individual project that would occur during the redevelopment process could still possibly affect these resources. Site-specific assessment of these potential effects would be conducted by redevelopers as new projects are proposed and reviewed during the local development approval process.

Internal Land Use Consistency

The proposed internal land use pattern represents a mixture of land uses which are generally compatible. Within the Yellow Water Area, industrial land use activities are targeted for approximately 4,500 acres of land. The light industrial land use district surrounds two areas designated for heavy industrial activities. Because the heavy industrial land uses are confined within the light industrial district, other proposed uses would be buffered from the impact of the heavy industrial activity. The proposed low FARs associated with the heavy industrial and light industrial areas encourage significant open space and help to ensure that natural buffers and environmentally sensitive areas are preserved. Land use activities adjacent to and west of the light industrial district include forestry, parks and recreation, and commercial development along Normandy Boulevard. These land uses are considered compatible.

The proposed internal land uses at the Main Station are compatible, with the exception of the area in the vicinity of the existing golf course and Lake Newman/Lake Fretwell recreational areas. Although the proposed parks and recreation land use is ideal given the existing facilities, this activity is not entirely consistent with the proposed adjacent heavy industrial areas to the east and aviation-related uses to the south.

Aviation-related uses on the Main Station would occupy approximately 2,000 acres. It is anticipated that several buildings in the area would be used to support helicopter and fixed-wing aircraft operations (CFDC 1996). The undeveloped areas, designated forestry/airport reserve lands, would provide a buffer between the station's industrial land uses and the less intense surrounding land uses.

The Preferred Reuse Plan capitalizes on several existing assets at the station to further the redevelopment effort. This primarily involves focusing redevelopment efforts around civilian reuse of all aviation facilities and established airspace/land use controls around the station. The plan recognizes the difficulty in replicating these assets for a new airport facility, and presents these assets as catalysts for new development on the former station property.

External Land Use Consistency

The Preferred Reuse Plan is generally compatible with the uses adjacent to NAS Cecil Field. Recreation/open space and forestry/airport reserve lands would be adjacent to the relatively undeveloped and rural areas west of NAS Cecil Field. The 641-acre area of Cecil Field in Clay County, which is designated for conservation, is adjacent to recreation/ preservation and open space areas in Clay County. Designated forestry/airport reserve uses in the eastern portion of the Main Station are consistent with adjacent land uses consisting of low-density, rural residential and agricultural uses.

The light industrial area that extends from the northern boundary of the Yellow Water Area south to Normandy Boulevard would be near mixed land uses including low-density residential and commercial activities. Although light industrial uses adjacent to low-density residential areas may be considered incompatible, the low FAR proposed in the plan and the preservation of natural surroundings would minimize this incompatibility. The planned forestry, recreation, and open space uses proposed for the western portion of the Yellow Water Area are consistent with adjacent rural residential and agricultural uses. The proposed commercial land uses along Normandy Boulevard and the light industrial land uses between Normandy Boulevard and 103rd Street do not present significant incompatibilities with adjacent uses.

Land use impacts would be gradual as specific elements of the plan are developed over the long time frame for projected buildout. As the development cycles of the plan are implemented and infrastructure facilities are provided, off-site development would be expected to reflect more urban intensities and densities than are currently exhibited. The expansion of Jacksonville's urban service area boundary would eventually include the NAS Cecil Field property.

Because land-use impacts would be gradual, all necessary facilities, such as transportation and utility infrastructure, should be in place to support the development. Overall, the redevelopment of NAS Cecil Field would influence the growth pattern in the southwest district by providing for a variety of commercial and industrial employment activities, rather than the singular use of the property as a military airfield.

Aesthetics

Development of the Preferred Reuse Plan would change the aesthetic features of the property, but the overall character of the station would not change significantly. On the Main Station, the implementation of the plan would result in improvements to the aesthetic resources. As part of the plan, the less desirable and unusable structures and utilities would be removed, and many of the existing positive visual environments, such as tall pine trees, which are dominant in the undeveloped areas and scattered in the developed areas, would remain to provide a unifying feature throughout the Main Station.

With the exceptions of a relatively small area and the ordnance storage facilities, the Yellow Water Area consists primarily of forested areas and wetlands. Development of the site with heavy and light industrial activities would result in a slight degradation of the visual components of the natural setting.

The aesthetic impacts to the Yellow Water Area would be offset through FAR controls, the designation of natural preservation of areas, establishment of buffers, landscaping, and sensitive design consideration in the siting of new industrial establishments.

4.1.2 Alternative Reuse Scenario 1

Under ARS 1, the former station property would be reused primarily for recreation/forestry uses. Limited portions of the station would be reused to support helicopter operations at the Main Station. The balance of the property would be reused for market-driven development. Land uses associated with market-driven development would likely be similar to but less extensive than pre-closure land uses, including office, light industrial, and manufacturing operations.

Development Constraint Analysis

Figure 4-2 depicts ARS 1 and land areas exhibiting known development constraints; Table 4-2 presents an analysis of the development potential of the station, if development occurred only on areas without documented constraints. Because development would be limited to currently developed areas of the Main Station, environmental features would not be significantly affected by this scenario.

Internal Land Use Consistency

As a result of the limited amount of development, no significant internal land use inconsistencies would result from implementing this ARS. However, while ARS 1 capitalizes

Table 4-2

CONSTRAINED LAND AREAS AND DEVELOPMENT POTENTIAL FOR ARS 1

Land Use	Area Devoted to Land Use (Acres)	Area with Constraints (Acres)[a]	Area with No Constraints (Acres)	Floor Area Ratio (FAR)[b]	Permitted Development Potential (sq. feet)[c]	New Development to 2010 (sq. feet)[b]	Additional Development Potential (sq. feet)[d]
Recreation/Forestry	15,578	8,128	7,450	NA	NA	NA	NA
Parks and Recreation	573	389	184	NA	NA	NA	NA
Helicopter Operations	158	30	128	NA	NA	NA	NA
Market-Driven Development	893	207	686	0.50	14,941,080	500,000	14,441,080
Total	17,202	8,754	8,448	NA	14,941,080	500,000	14,441,080

[a] Land areas containing at least one of the following constraints: wetlands, floodplains, habitats of species of concern, potentially archaeologically sensitive areas, or environmentally contaminated areas.

[b] As proposed in the *Cecil Field Base Final Reuse Plan* (CFDC 1996).

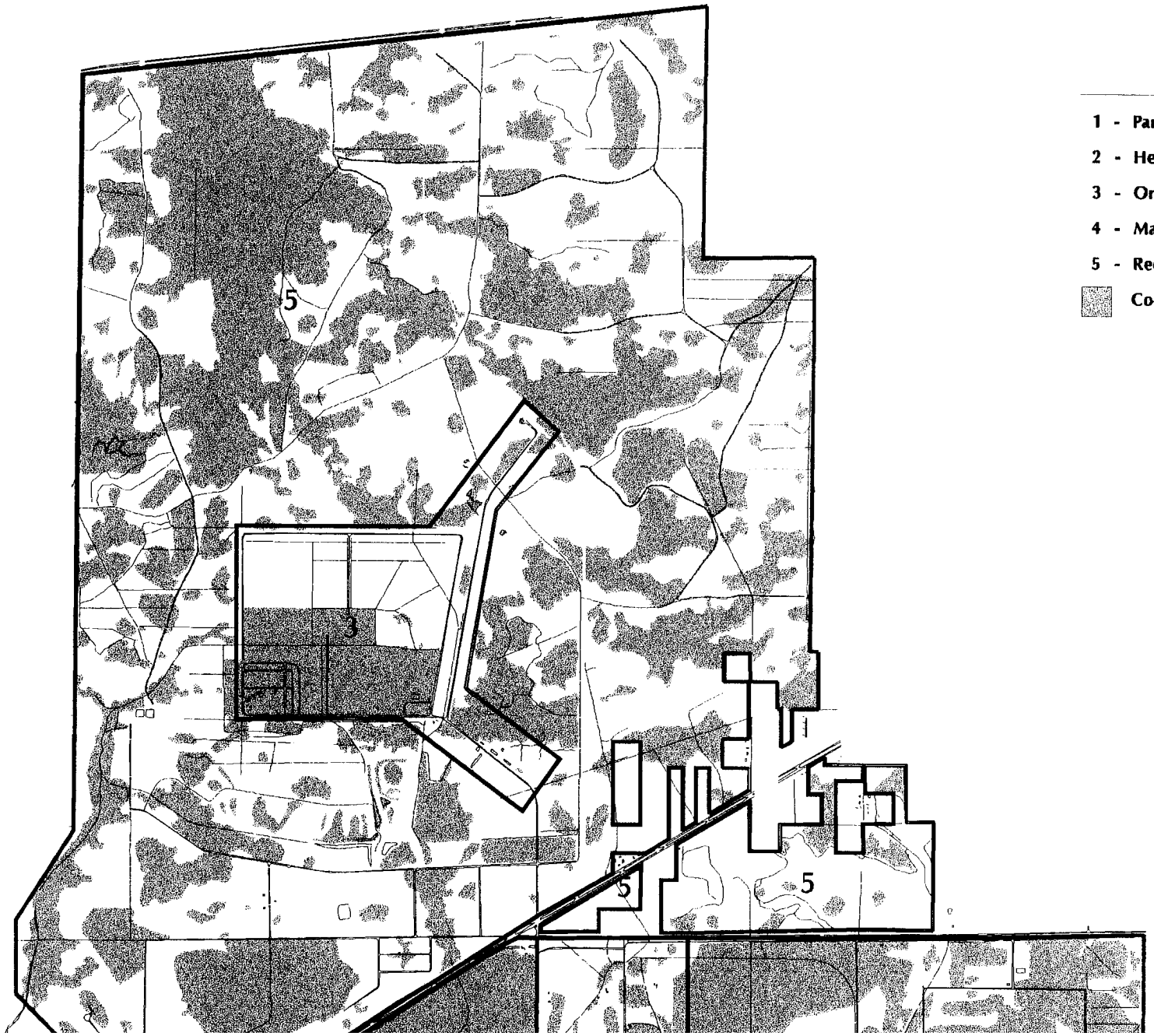
[c] Permitted development potential calculated by multiplying the floor area ratio by the land area without development constraints (i.e., converted into square feet).

[d] Additional development potential calculated by subtracting planned development to 2010 from permitted development potential.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no buildings would be developed in these areas.

Source: Ecology and Environment, Inc., 1996.



LEGEND

1 - Parks and Recreation

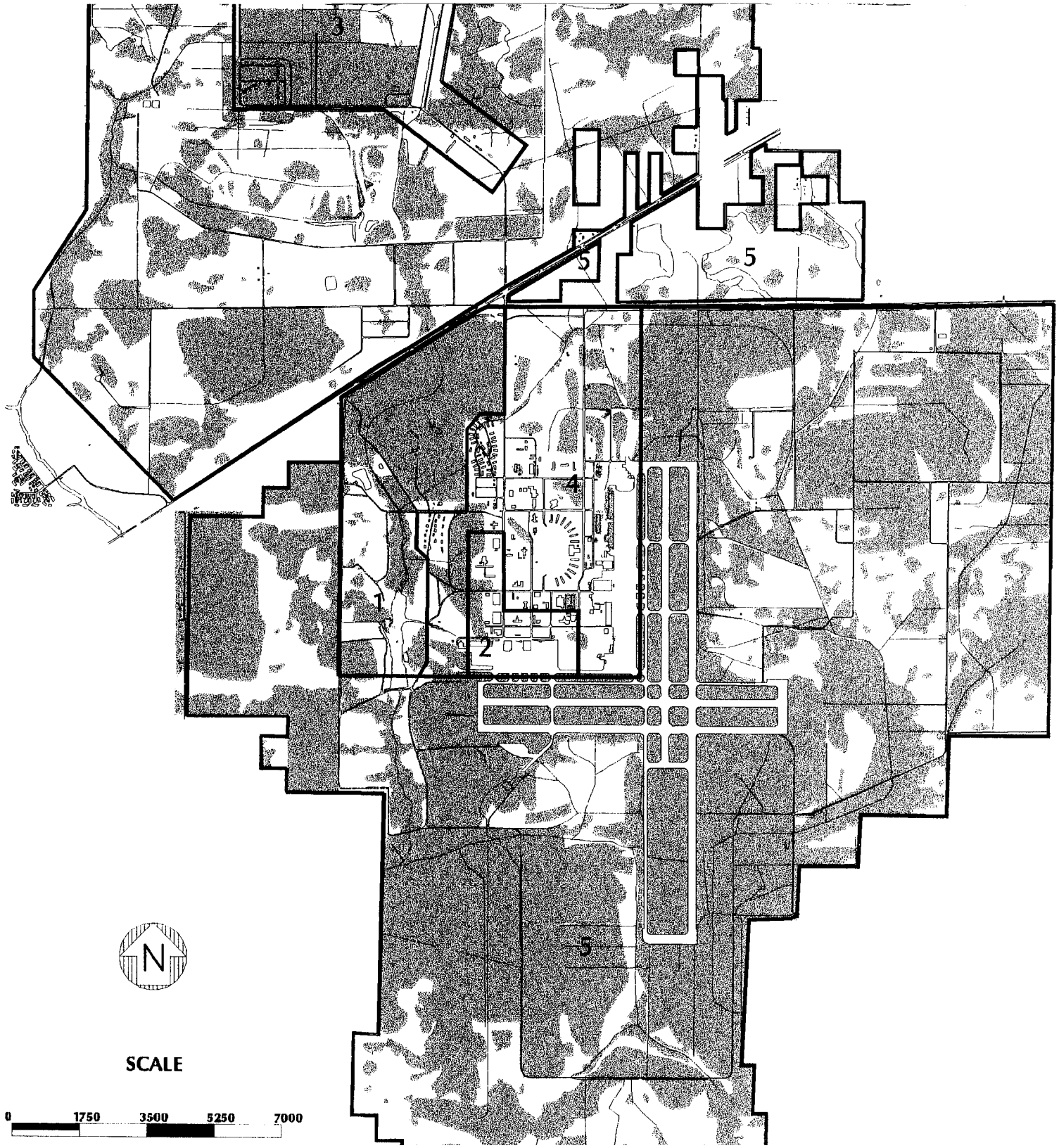
2 - Helicopter Operations

3 - Ordnance Storage

4 - Market-Driven Development

5 - Recreation/Forestry

Constrained Land Areas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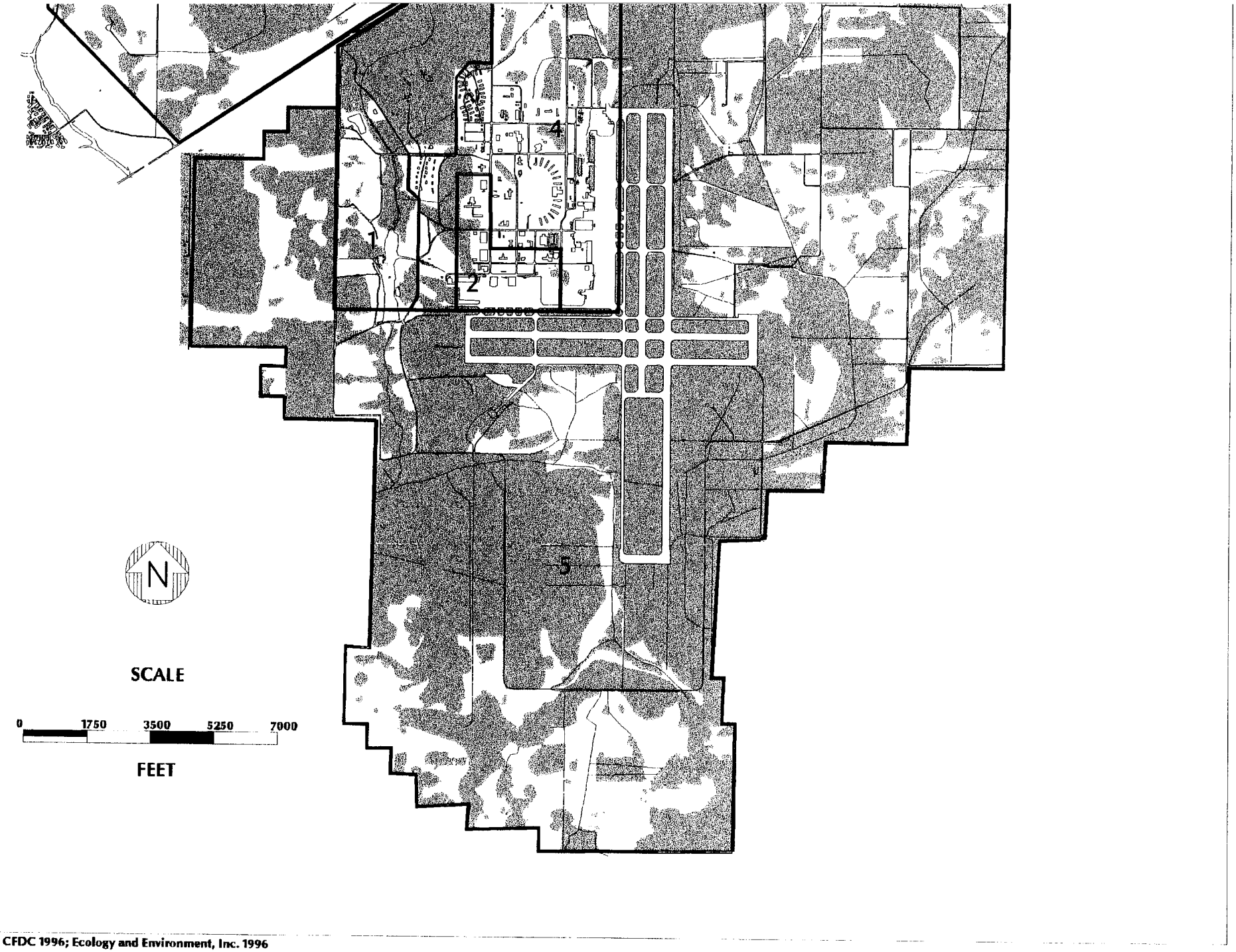

Source: CFDC 1996; Ecology and Environment, Inc. 1996

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Figure 4-2 ARS 1 : CONSTRAINED LAND AREAS

on the forestry assets at the station, it does little to take advantage of the valuable aviation assets. Further, because no centralized receiving entity would oversee development of the base, there is a greater possibility for incompatible market-driven development on the Main Station.

External Land Use Consistency

No significant external land use inconsistencies would result from implementing this plan.

Aesthetic Impacts

Implementation of this ARS could result in short- and long-term aesthetic impacts in previously developed areas of the station. It is expected that existing buildings would deteriorate and only necessary maintenance of structures consistent with a caretaker approach would occur (i.e., buildings awaiting reuse). Based on the scale of the property, it is likely that existing buildings and station grounds would become aesthetically displeasing.

4.1.3 Alternative Reuse Scenario 2

Under ARS 2, reuse of the former station property would primarily involve the reuse of the existing airfield facilities for civilian aircraft and helicopter operations. However, no major investments in infrastructure or other activities to encourage redevelopment would occur. Administrative measures, such as land development regulations and the comprehensive plan process, would be the primary controls over redevelopment. Redevelopment efforts would be focused on the developed area of the Main Station. Other than market-driven development around the previously disturbed ordnance storage area, the Yellow Water Area would not realize any appreciable new development. Immediate reuse of facilities in the developed area of the Main Station would be random and driven by general aviation uses. The balance of the property would continue to be used for its forestry resources. The future reuse and development of land at NAS Cecil Field would be a result of the comprehensive planning process, land development regulation process, and private market forces. In the long-term, redevelopment of properties by private interests would largely be limited to land uses that are consistent with pre-closure uses.

Development Constraint Analysis

Figure 4-3 depicts ARS 2 and land areas exhibiting known development constraints; Table 4-3 presents an analysis of the development potential of the station if development occurred only on areas without documented constraints. Environmental constraints would not significantly affect the implementation of ARS 2. The CFDC projects that approximately 500,000 square feet of new development could be realized under ARS 2 (CFDC 1996). However, development that would be allowed using FAR standards would total over 18 million square feet. Therefore, projected development could reasonably be implemented without affecting constrained land areas.

Internal Land Use Consistency

No significant internal land use inconsistencies would result from implementing ARS 2. Because new development would be very limited and center around already disturbed areas, it is unlikely that internal land use conflicts would result. Depending on the ultimate mix of market-driven development in the developed portion of the Main Station, there would be a small potential for conflicts with proposed park and recreation land. Such conflicts would be assessed by the ultimate receiving entity through the city's review process.

External Land Use Consistency

No significant external land use inconsistencies would result from implementing ARS 2. Forestry uses would abut adjacent properties under ARS 2; therefore there would be no change from current conditions.

Aesthetic Impacts

Based on the limited amount of proactive planning and development under ARS 2, there is a potential for the deterioration of existing facilities at the station after disposal.

4.1.4 Alternative Reuse Scenario 3

ARS 3 involves the most aggressive redevelopment approach among the alternatives. It would involve completely dismantling all aviation assets at the station and redeveloping the property into a large-scale, mixed-use complex of manufacturing, light industrial, residential, and recreational uses.

Table 4-3

CONSTRAINED LAND AREAS AND DEVELOPMENT POTENTIAL FOR ARS 2

Land Use	Area Devoted to Land Use (Acres)	Area with Constraints (Acres)[a]	Area with No Constraints (Acres)	Floor Area Ratio (FAR)[b]	Permitted Development Potential (sq. feet)[c]	Planned New Development to 2010 (sq. feet)[b]	Additional Development Potential (sq. feet)[d]
Forestry	11,737	6,382	5,355	NA	NA	NA	NA
Parks and Recreation	2,332	1,265	1,067	NA	NA	NA	NA
General Aviation	1,833	670	1,163	NA	NA	NA	NA
Market-Driven Development	1,300	437	863	0.50	18,796,140	500,000	18,296,140
Total	17,202	8,754	8,448	NA	18,796,140	500,000	18,296,140

[a] Land areas containing at least one of the following constraints: wetlands, floodplains, habitats of species of concern, potentially archaeologically sensitive areas, or environmentally contaminated areas.

[b] As proposed in the *Cecil Field Final Base Reuse Plan* (CFDC 1996).

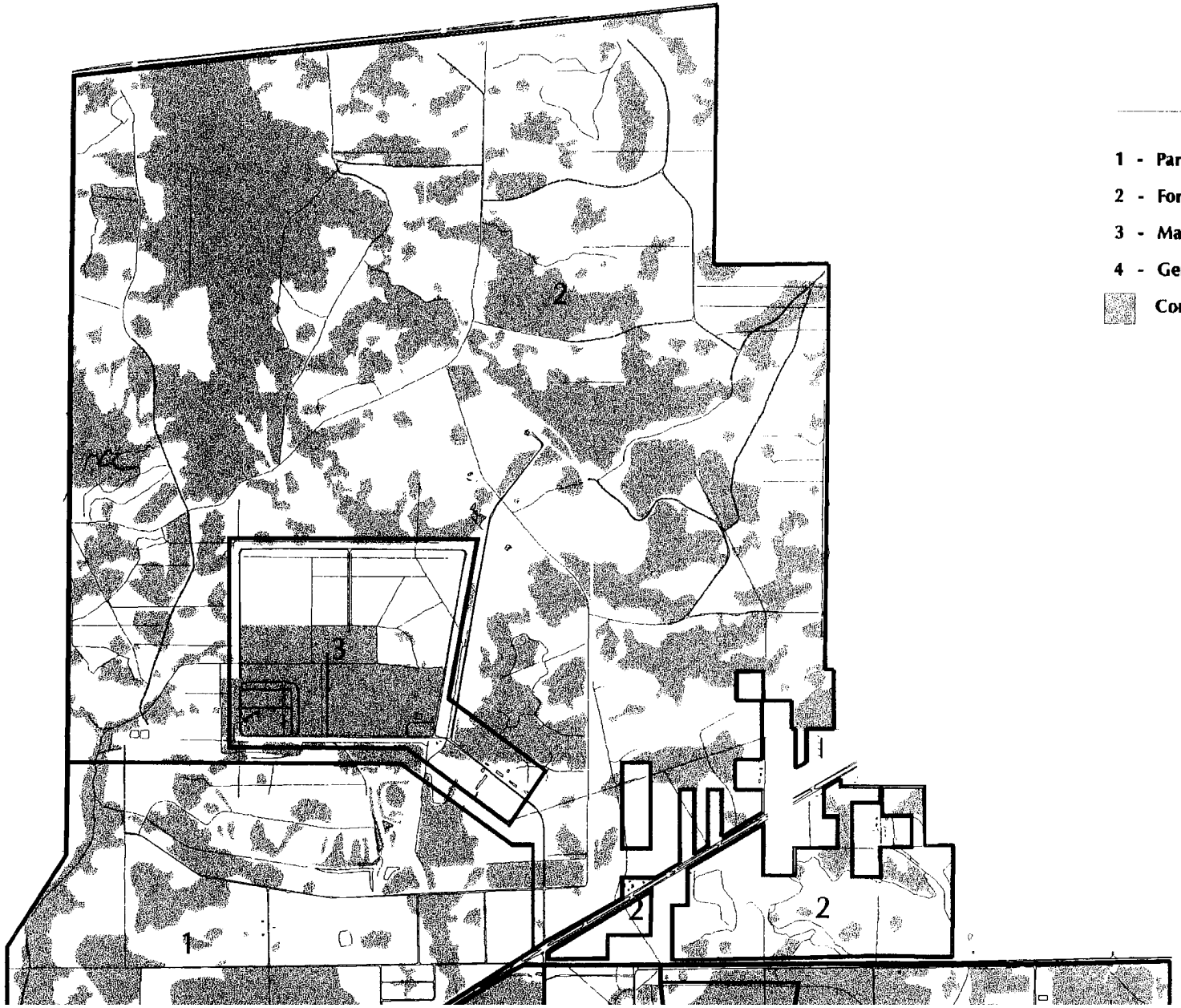
[c] Permitted development potential calculated by multiplying the floor area ratio by the land area without development constraints (i.e., converted into square feet).

[d] Additional development potential calculated by subtracting planned development to 2010 from permitted development potential.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no buildings would be developed in these areas.

Source: Ecology and Environment, Inc., 1996.


LEGEND
1 - Parks and Recreation
2 - Forestry
3 - Market-Driven Development
4 - General Aviation
Constrained Land Areas
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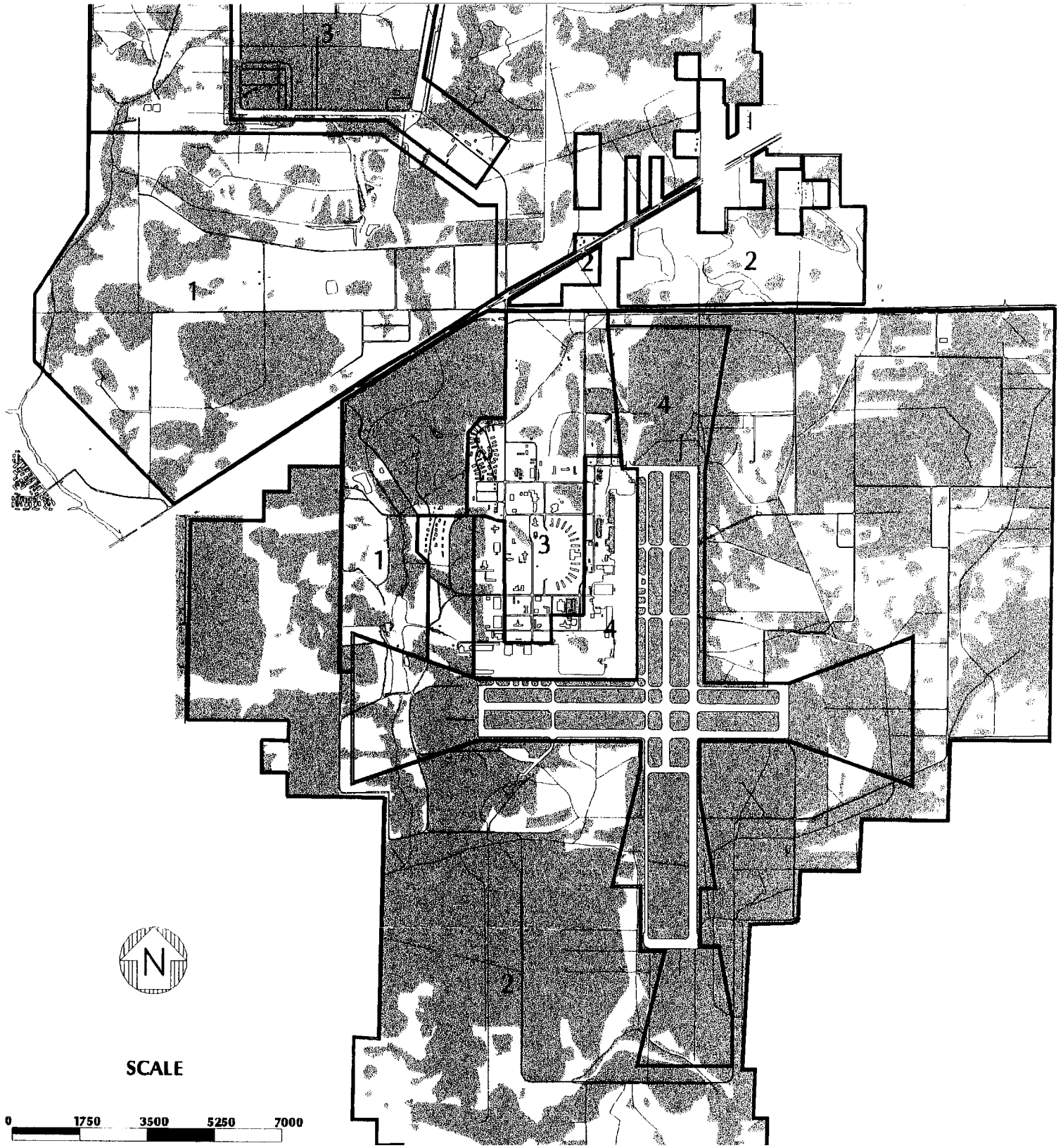
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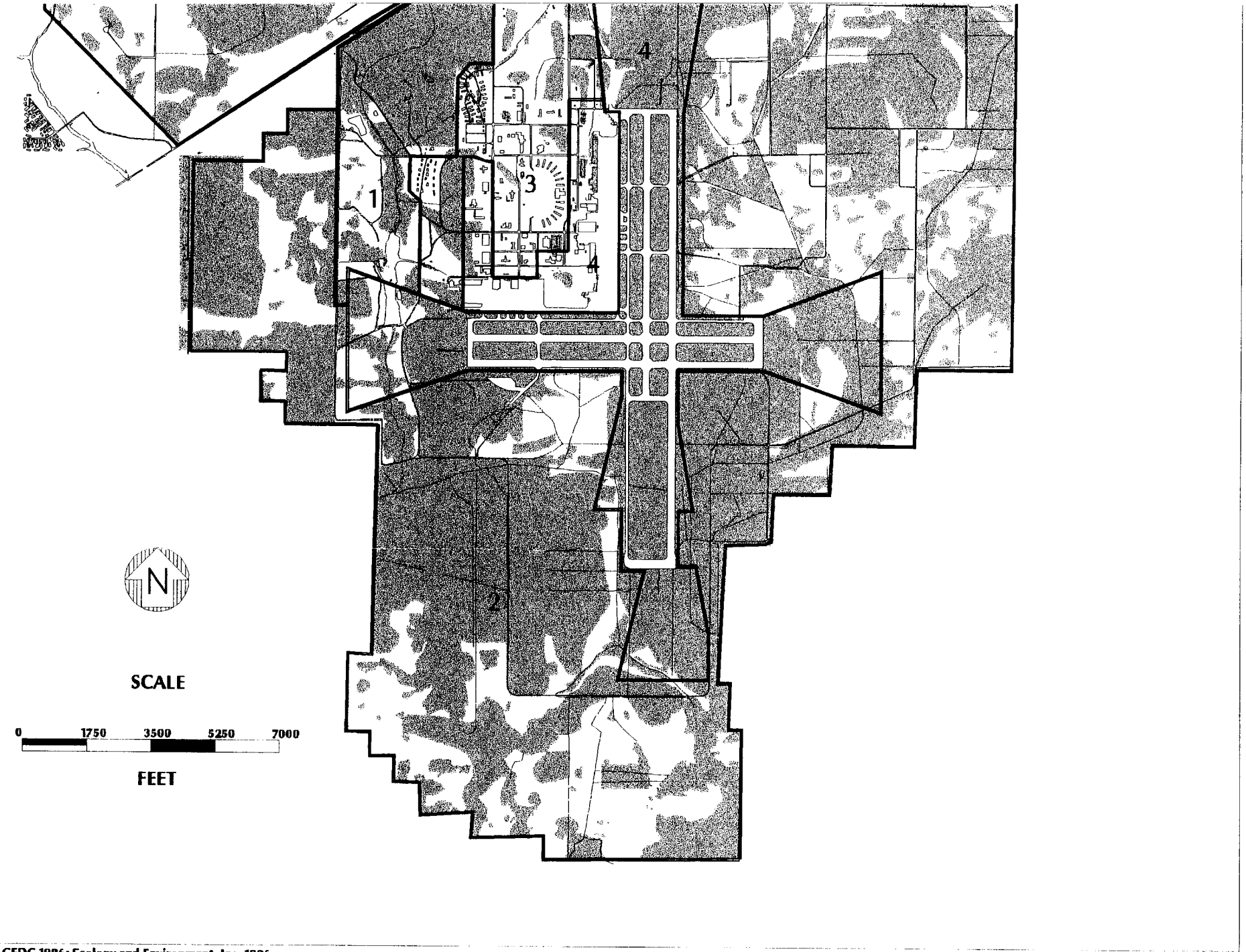

Source: CFDC 1996; Ecology and Environment, Inc. 1996

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Figure 4-3 ARS 2 : CONSTRAINED LAND AREAS

Development Constraint Analysis

Figure 4-4 depicts ARS 3 and land areas exhibiting known development constraints; Table 4-4 presents an analysis of the development potential of the station, if development occurred only in areas without documented constraints. While industrial and commercial development under ARS 3 would not be significantly affected by development constraints, the planned residential development would be impeded by environmental features at the station, if developed at the assumed density (i.e., one unit per 2 acres). Notwithstanding, it is likely that the residential development could be "clustered" into smaller sized lots of 1 acre or less to avoid constrained areas, while maintaining the same overall net yield of residential units.

Internal Land Use Consistency

Development under ARS 3 would not likely result in any significant internal land use conflicts. However, by introducing residential uses into the scenario, the potential exists for future conflicts with industrial and manufacturing uses if these areas are not properly buffered from one another.

Overall, ARS 3 takes the least advantage of existing assets at the station by complete discontinuation of aviation facilities and long-term development of all lands currently used for their forestry resources. In turn, ARS 3 would involve the most infrastructure investment to facilitate any development activities.

External Land Use Consistency

This ARS would result in limited conflicts with off-station land uses, and is consistent with mixed-use development goals established in the *Jacksonville Comprehensive Plan.* However, based on the limited amount of development in this section of the city, encouragement of such an extensive development outside the city's existing urban service area could have the potential for contributing to urban sprawl, altering the anticipated growth patterns in this section and resulting in an unintended need for capital improvements and speculative land ventures.

Aesthetic Impacts

Aesthetic impacts would be similar to the impacts associated with the Preferred Reuse Plan.

Table 4-4

CONSTRAINED LAND AREAS AND DEVELOPMENT POTENTIAL FOR ARS 3

Land Use	Area Devoted to Land Use (Acres)	Area with Constraints (Acres)[a]	Area with No Constraints (Acres)	Floor Area Ratio (FAR)[b]	Permitted Development Potential (sq. feet)[c]	Planned New Development to 2010 (sq. feet)[b]	Additional Development Potential (sq. feet)[d]
Conservation	2,292	1,577	715	NA	NA	NA	NA
Open Space	1,574	642	932	NA	NA	NA	NA
Parks and Recreation	570	394	176	NA	NA	NA	NA
Planned Residential	3,471	2,279	1,192	NA[e]	NA - 1,192 units	NA - 3,250 units	NA (2,058 units)
Commercial	410	55	355	0.30	4,639,140	200,000	4,439,140
Business Park	307	86	221	0.50	4,813,380	275,000	4,538,380
Incubator Uses	720	147	573	0.50	12,479,940	275,000	12,204,940
Light Industrial	4,149	1,784	2,365	0.15	15,452,910	2,000,000	13,452,910
Manufacturing	3,709	1,790	1,919	0.15	12,538,746	750,000	11,788,746
Total	17,202	8,754	8,448	NA	49,924,116	3,500,000	46,424,116

[a] Land areas containing at least one of the following constraints: wetlands, floodplains, habitats of species of concern, potentially archaeologically sensitive areas, or environmentally contaminated areas.

[b] As proposed in the *Cecil Field Final Base Reuse Plan* (CFDC 1996).

[c] Permitted development potential calculated by multiplying the floor area ratio by the land area without development constraints (i.e., converted into square feet).

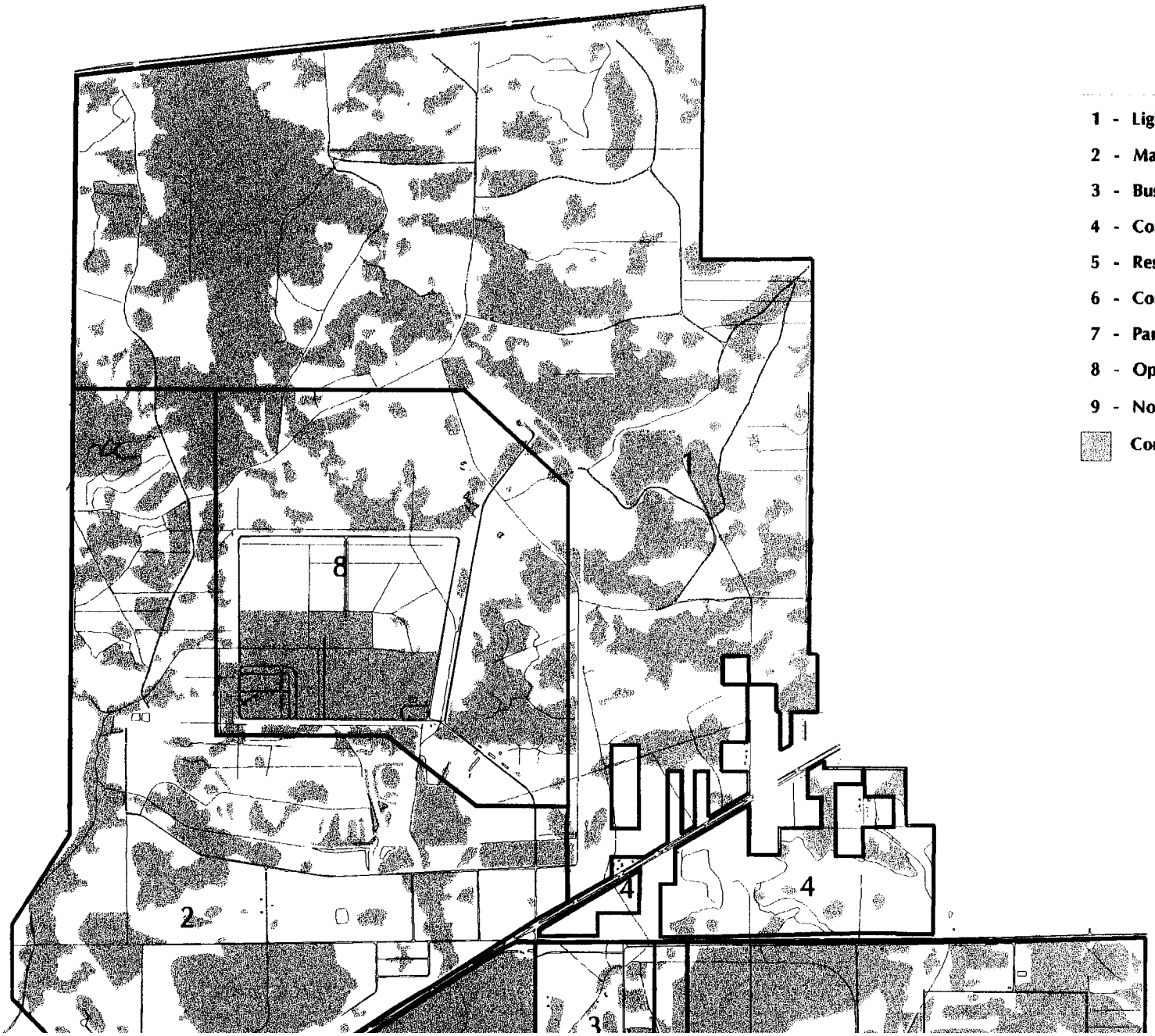
[d] Additional development potential calculated by subtracting planned development to 2010 from permitted development potential.

[e] FAR not applicable; permitted density assumed to be one residential unit per acre.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no buildings would be developed in these areas.

Source: Ecology and Environment, Inc., 1996.



LEGEND

1 - Light Industrial

2 - Manufacturing

3 - Business Park

4 - Commercial

5 - Residential

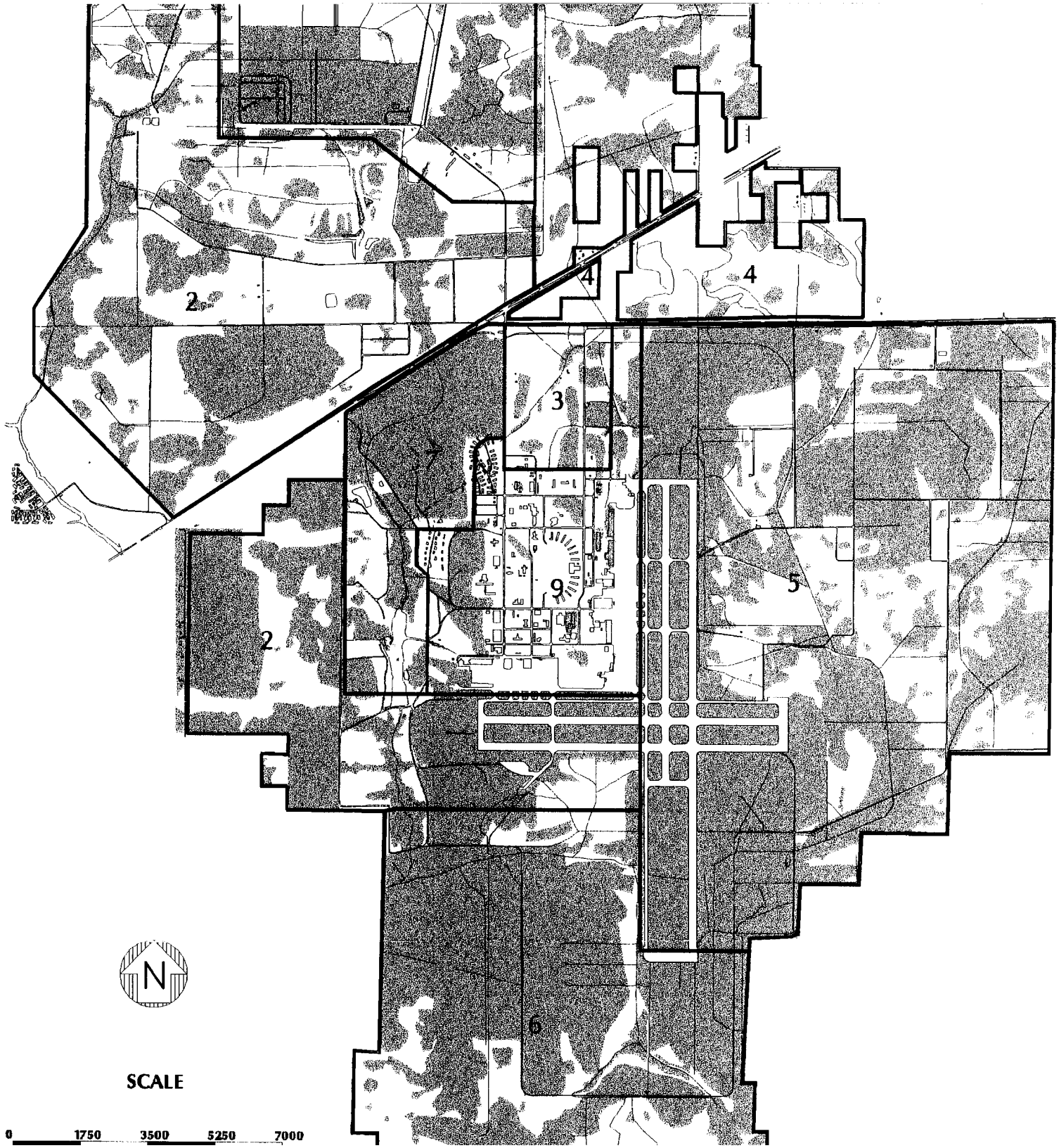
6 - Conservation

7 - Parks and Recreation

8 - Open Space

9 - Non-Aviation/Incubator

Constrained Land Areas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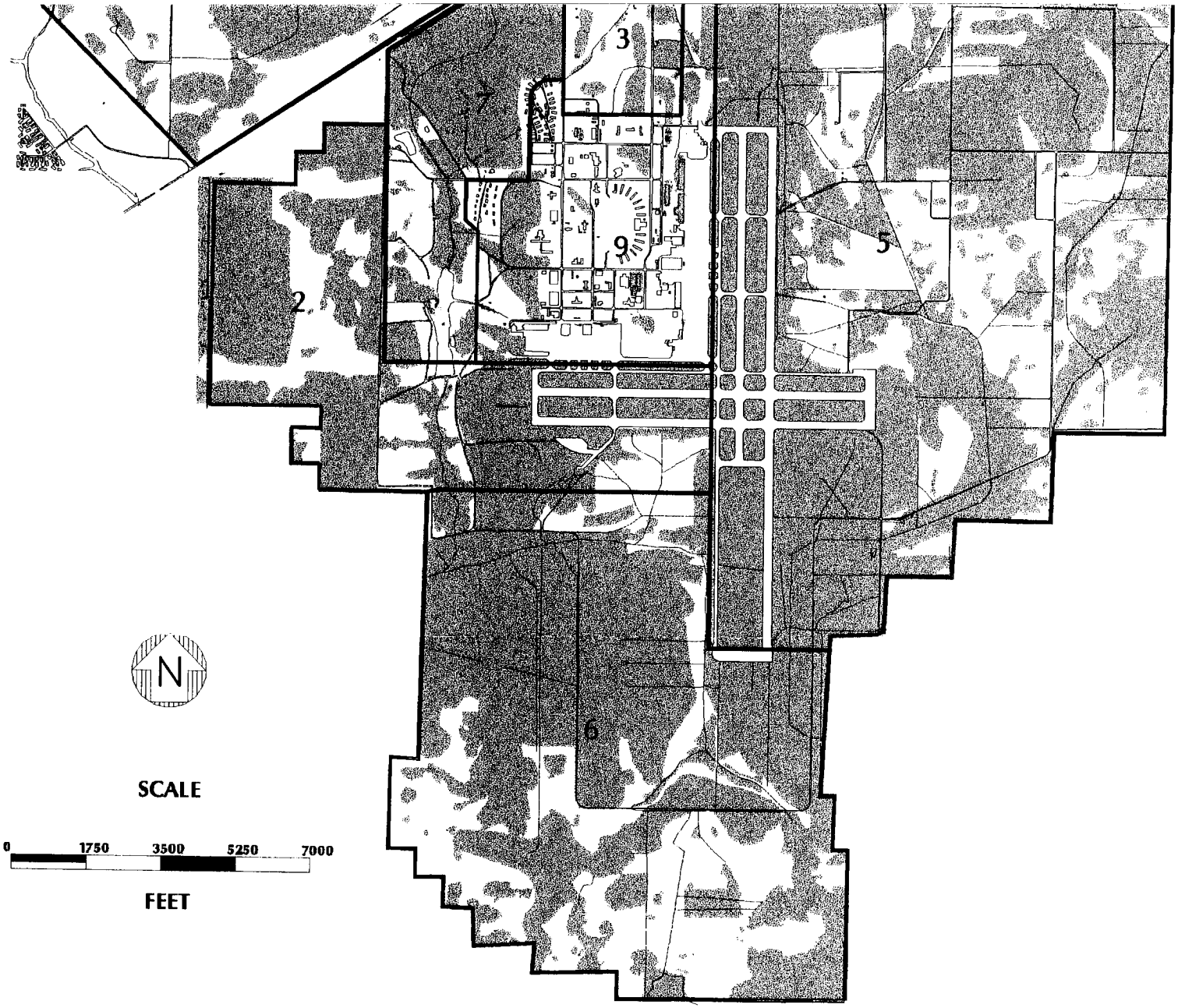

Source: CFDC 1996; Ecology and Environment, Inc. 1996

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Figure 4-4 ARS 3 : CONSTRAINED LAND AREAS

4.1.5 Alternative Reuse Scenario 4

ARS 4 is similar to the Preferred Reuse Plan, except that it introduces additional land uses at the Yellow Water Area and an additional land use district at the Main Station. Under ARS 4, the Yellow Water Area's light industrial, agriculture, and recreation land use activities would be reduced to provide land for a corrections facility and a juvenile justice facility.

A new light industrial area is included for the area west of the proposed park and recreation area on the Main Station. This reduces the amount of forestry land as proposed under the Preferred Reuse Plan and represents a slight land use incompatibility with the adjacent park area.

No significant internal or external land use inconsistencies would result from implementing this plan.

Development Constraint Analysis

Figure 4-5 depicts ARS 4 and land areas exhibiting known development constraints; Table 4-5 presents an analysis of the development potential of the station, if development occurred only on areas without documented constraints. Environmental features would not significantly affect the implementation of ARS 4.

Internal Land Use Consistency

The internal land use consistency would be similar to the Preferred Reuse Plan. The major difference would involve proposed uses of the Yellow Water Area. Both the corrections and juvenile justice facilities would be adjacent to light industrial activities. This could result in potential land use conflicts depending on the type and intensity of industrial uses ultimately developed. However, given the FAR standards assumed under ARS 4, new industrial development could be controlled so that it does not adversely affect populations in the corrections or juvenile justice facilities.

External Land Use Consistency

The external land use consistency would be similar to the Preferred Reuse Plan. Proposed land uses abutting areas surrounding the station would include a mix of forestry, conservation, parks and recreation, and light industrial uses, as under the Preferred Reuse Plan.

Table 4-5

CONSTRAINED LAND AREAS AND DEVELOPMENT POTENTIAL FOR ARS 4

Land Use	Area Devoted to Land Use (Acres)	Area with Constraints (Acres)[a]	Area with No Constraints (Acres)	Floor Area Ratio (FAR)[b]	Permitted Development Potential (sq. feet)[c]	Planned New Development to 2010 (sq. feet)[b]	Additional Development Potential (sq. feet)[d]
Conservation	641	296	345	NA	NA	NA	NA
Forestry	980	598	382	NA	NA	NA	NA
Forestry/Airport Reserve	4,452	2,957	1,495	NA	NA	NA	NA
Parks and Recreation	2,955	1,363	1,592	NA	NA	NA	NA
State Corrections Facility	1,439	650	789	0.10	3,436,884	1,000,000	2,436,884
Juvenile Justice Facility	126	44	82	0.15	535,788	0	535,788
General Aviation	1,566	1,142	424	NA	NA	NA	NA
Aviation-Related Services	445	103	342	0.50	7,448,760	0	7,448,760
Commercial	207	25	182	0.30	2,378,376	100,000	2,278,376
Light Industrial	3,362	1,263	2,099	0.15	13,714,866	2,500,000	11,214,866
Heavy Industrial	1,029	313	716	0.15	4,678,344	1,250,000	3,428,344
Total	17,202	8,754	8,448	NA	32,193,018	4,850,000	27,343,018

Key at end of table.

Table 4-5 (Cont.)

[a] Land areas containing at least one of the following constraints: wetlands, floodplains, habitats of species of concern, potentially archaeologically sensitive areas, or environmentally contaminated areas.
[b] As proposed in the *Cecil Field Final Base Reuse Plan* (CFDC 1996).
[c] Permitted development potential calculated by multiplying the floor area ratio by the land area without development constraints (i.e., converted into square feet).
[d] Additional development potential calculated by subtracting planned development to 2010 from permitted development potential.

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable; no buildings would be developed in these areas.

Source: Ecology and Environment, Inc., 1996.

LEGEND

1 - Light Industrial

2 - Heavy Industrial

3 - Forestry

4 - Forestry/Airport Reserve

5 - Commercial

6 - General Aviation

7 - Conservation

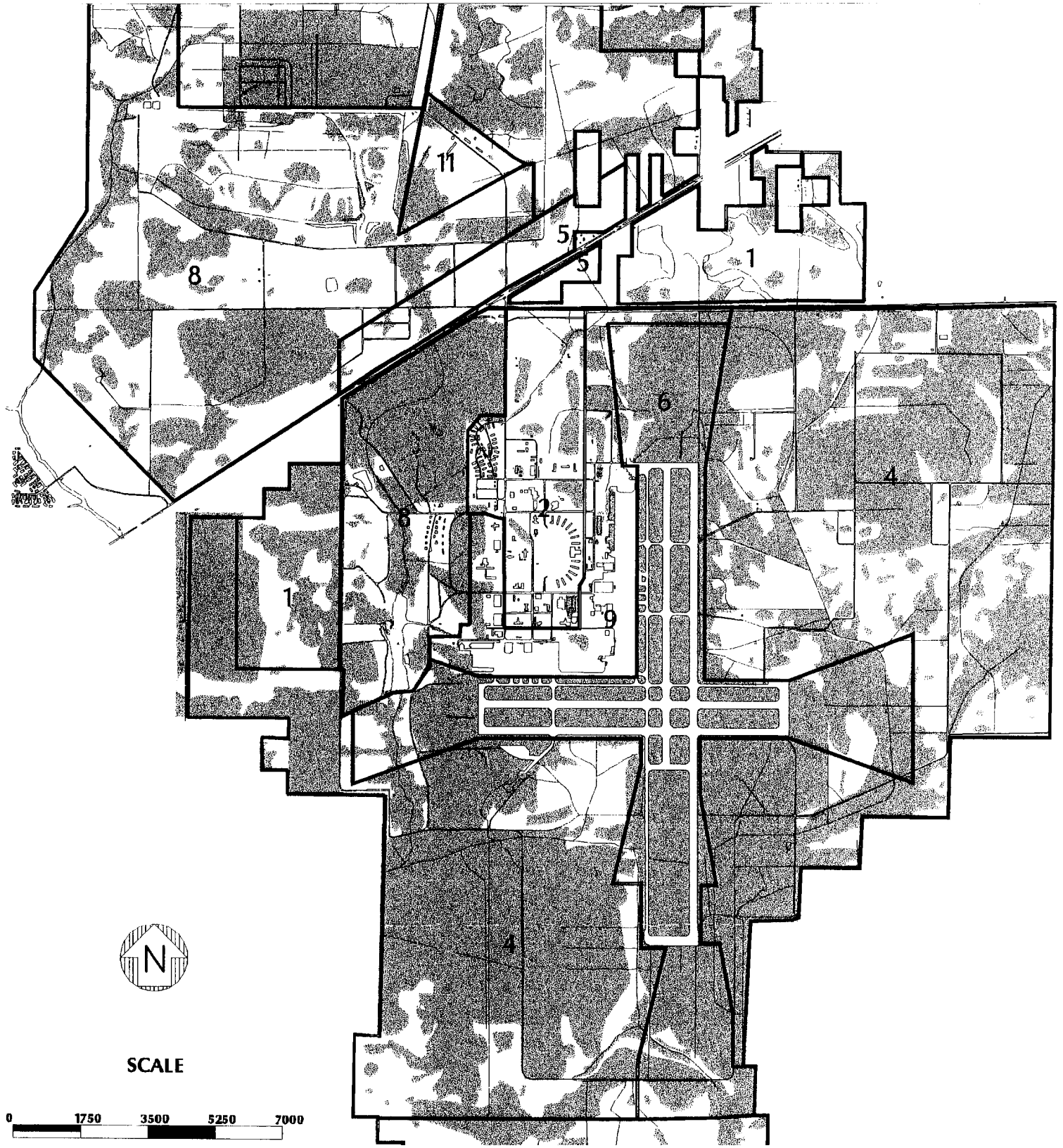
8 - Parks and Recreation

9 - Aviation-Related Services

10 - State Corrections Facility

11 - Juvenile Justice Facility

Constrained Land Areas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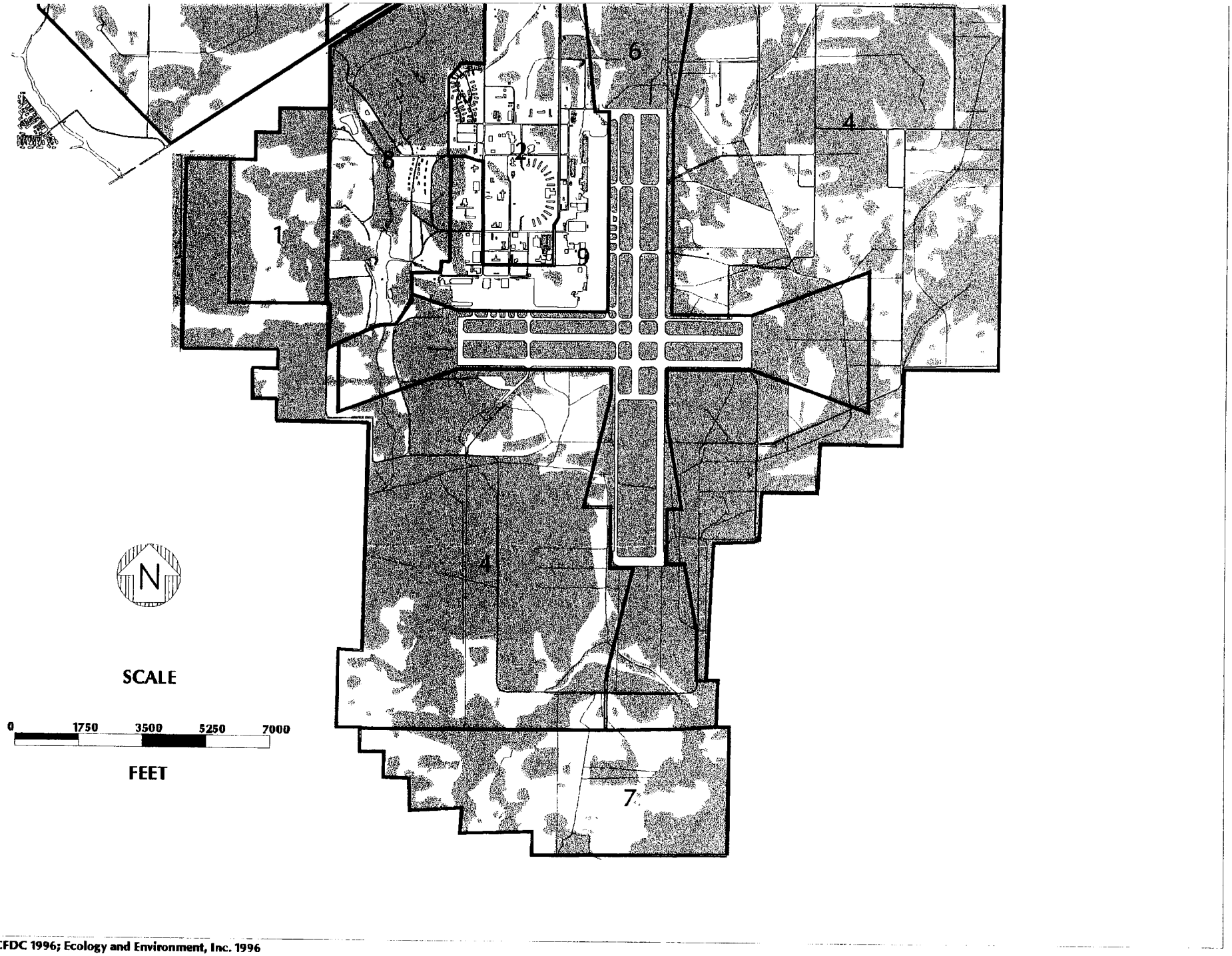

Source: CFDC 1996; Ecology and Environment, Inc. 1996

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Figure 4-5 ARS 4 : CONSTRAINED LAND AREAS

Aesthetic Impacts

Aesthetic impacts would be similar to the Preferred Reuse Plan.

4.1.6 Cumulative Impacts

There are no reasonably foreseeable land use actions or development activities around NAS Cecil Field that would result in cumulative impacts to land use. However, the actual redevelopment of NAS Cecil Field (specifically, planned infrastructure changes to support this redevelopment) could result in cumulative impacts to land use on the west side of Jacksonville.

As discussed in Section 4.9, infrastructure changes to support redevelopment would include amending the urban service boundary in the city's Comprehensive Plan to include the station property. These boundaries define areas of priority for public infrastructure investment, such as potable water and sewer facilities. Assuming that significant new public investments will be made to support redevelopment of the station, these improvements could influence new development around the station property that could benefit from expanded water and sewer facilities. However, the potential for such "spin-off" development would be tempered by overall demand for new development in the west side of Jacksonville, which is expected to be somewhat lower than demand in other parts of the city (Jacksonville Planning and Development 1990).

4.1.7 Mitigation Measures

To mitigate potential land use impacts, the receiving entity or Duval/Clay counties will implement appropriate planning mechanisms to ensure that the redevelopment and reuse of NAS Cecil Field is consistent with the city/county development objectives. These measures include:

- Establishing an effective redevelopment strategy and implementation plan that is consistent with established land use categories and zoning classifications;
- Effectively managing and implementing a capital improvement program; and
- Coordinating land use development with contamination clean-up and investigation.

Implementation, Land Use and Zoning

To minimize land use conflicts, the land use implementation strategy of the receiving entity must be consistent with the reuse plan as amended to the *2010 Jacksonville Comprehensive Plan* and approved in accordance with the Florida Defense Conversion and Transition Act. Because the property would be transferred from the Navy to non-federal entities, the land would become subject to state and local government control. Therefore, once the reuse plan is formally adopted and approved as a land use amendment to the Jacksonville and Clay County Comprehensive Plans, subsequent changes to the original reuse plan would be subject to the requirements of Chapter 163 FS, and depending on the magnitude of the change may be subject to the requirements of Chapter 380 FS (pertaining to Developments of Regional Impact). Therefore, the implementation strategy of the responsible entities needs to be consistent with the approved reuse plan (as amendments to respective local comprehensive plans) and the locally adopted zoning classification for effective and efficient implementation of the redevelopment process.

Capital Improvements Program (CIP)

The implementation of the Preferred Reuse Plan would require significant capital expenditures and programming for improvements such as water and sewer, aviation system improvements, road and drainage improvements, rail improvements, and demolition. The programming would coordinate the associated cost of capital projects with the phasing and sequence of the redevelopment process. The receiving entity would formulate an overall CIP for the station property, identifying new/upgraded facilities required, prioritization of improvements in accordance with redevelopment goals and projects, and financing mechanisms to fund such facilities. This plan would then be incorporated into the Jacksonville city-wide CIP, which would be adopted by the City Council.

The CIP would have to be coordinated among the major receivers of property. Because several competing entities would require capital improvements to support their respective redevelopment goals, certain issues for effective implementation need to be considered, such as:

- Which entity(s) would be responsible for the cost of providing area-wide and site-specific infrastructure;
- How the CIP would relate to the phasing of the Preferred Reuse Plan; and

- How the on- and off-site improvements would be coordinated among entities on-site and the service providers.

Clarification of these issues would result in a more effective and economically efficient redevelopment process.

Coordination of Development with Future and Ongoing Contamination Investigations

It is not anticipated that existing contamination would influence future land use development (see Section 4.11). However, land development activities will have to consider those areas in which remedial actions are under way but incomplete and areas in which hazardous sites are identified but remedial actions have not been undertaken. The investigation and analysis of these areas is ongoing by the Navy, EPA, and FDEP; therefore, information regarding the extent and types of contamination at the station will not be fully available until after the EIS process is complete. The ultimate receiving entity will be required to coordinate with the Navy, EPA, and FDEP to ensure that land use conflicts do not occur in the future. This would be consistent with the team approach to remediation presented in the *BRAC Cleanup Plan* (see Section 4.11).

4.2 Topography, Geology, and Soils

4.2.1 Preferred Reuse Plan

Implementation of the Preferred Reuse Plan would not adversely impact soils on the base property, but limited impacts would be associated with specific construction projects and result in soil compaction, rutting, and exposure to potential erosion. Impacts to soils would be restricted to the area of disturbance only, and would be minimized by the use of standard soil erosion and sedimentation control measures (i.e., hay bales, silt fences, etc.) during the construction phase of new projects (see Section 4.2.7).

Much of the area proposed for redevelopment is currently developed; therefore, the soils have been previously disturbed. In undisturbed areas where development is proposed, enough land area is available to site buildings and/or structures so that areas with soil-related development constraints or high erosion potential can be avoided.

As this plan is implemented, site-specific analysis of soil conditions would be conducted in conjunction with the development of soil erosion and sedimentation control plans. Each soil erosion and sedimentation control plan would include descriptions of acceptable post-development storm water runoff rates and provide general drainage design

criteria. Specific soil erosion and sedimentation control measures would be instituted as part of the local review and permitting process, consistent with the conservation element of the *Jacksonville Comprehensive Plan.*

No impacts to local or regional geologic resources or topography would result from this plan.

4.2.2 Alternative Reuse Scenario 1

Implementation of ARS 1 would result in similar impacts as discussed for the Preferred Reuse Plan. Because limited new development is proposed, impacts to soils under this ARS would be primarily associated with ground disturbance resulting from demolition activities, removal of utilities, and ongoing management of forestry resources.

4.2.3 Alternative Reuse Scenario 2

Implementation of ARS 2 would result in similar impacts as discussed for the Preferred Reuse Plan.

4.2.4 Alternative Reuse Scenario 3

Implementation of ARS 3 would result in similar impacts as discussed for the Preferred Reuse Plan.

4.2.5 Alternative Reuse Scenario 4

Implementation of ARS 4 would result in similar impacts as discussed for the Preferred Reuse Plan.

4.2.6 Cumulative Impacts

There are no reasonably foreseeable actions that would result in cumulative impacts to topography, geology, and soils at the NAS Cecil Field property. All anticipated impacts would be localized in nature and associated with redevelopment activities.

4.2.7 Mitigation Measures

Site-specific impacts to soils would be minimized by avoidance of areas where soils may present development constraints (i.e., where a high erosion potential exists). Mitigation measures taken by the ultimate site developers would include the use of standard soil erosion and sedimentation control measures during the construction phase of new projects (i.e., hay

bales, silt fences, etc.). Specific soil erosion and sedimentation control measures would be instituted as part of the local review and permitting process, consistent with the conservation element of the *Jacksonville Comprehensive Plan*.

4.3 Terrestrial Resources

Upon the closure of NAS Cecil Field, terrestrial resources would be managed in accordance with a natural resource management plan being developed by the USFWS (Epstein 1995). This plan will set forth policies for resource management prior to final disposal by the Navy. Following disposal by the Navy, redevelopment activities would be conducted by receiving entities and private developers. These entities would be responsible for obtaining appropriate reviews, approvals, and permits associated with terrestrial resource protection prior to conducting redevelopment activities.

4.3.1 Preferred Reuse Plan

Implementation of the Preferred Reuse Plan would result in overall minor impacts to terrestrial resources in the short-term and interim time frame, and moderate impacts in the long-term time frame.

Upland Vegetation and Wildlife

Implementation of the Preferred Reuse Plan would not significantly impact upland vegetation and wildlife in the short term. Developed areas on the Main Station including existing facilities, airstrips, and the golf course would continue to be used in their present state with no additional development of surrounding areas. The golf course and other recreational lands on the Main Station (e.g., Lake Fretwell) would continue to be maintained in their present condition with no impacts to the existing vegetation or wildlife.

The remaining extensive lands on the west, south, and east sides of the Main Station, including areas surrounding the airstrips, and the majority of the Yellow Water Area would be used for passive recreation and forestry purposes. The potential uses could include the development of ball fields, equestrian trails, and the maintenance of existing trails and roads to be used for hiking and biking. Such recreational activities would negligibly impact vegetation and wildlife due to their typically unobtrusive nature and the small amount of terrestrial resources impacted relative to the total undeveloped acreage on the station. Most of these areas would continue to be managed under a basewide forestry management plan to be developed by CFDC. The plan would likely be similar to the Navy's existing management

plan, which is designed for sustainable management of the forest resources. Periodic selective harvesting of pinelands and hardwood habitats would continue. Harvesting results in both the loss of habitat for certain forest-dwelling wildlife species and the creation of open habitat for other species. Overall, a variety of forest stands of different ages would be maintained by the forestry management plan to the benefit of wildlife species.

The southern end of the Main Station would be maintained in its present state as a conservation area. This area would adjoin the Brannan Field Mitigation Park (which is managed by the FGFWFC), the Jennings State Forest, and the city's proposed Wildlife Management Area to create a sizeable contiguous conservation area. Most of this conservation area is upland pine and hardwood forests.

The proposed long-term construction of heavy and light industrial developments and additional buildings and facilities would require land clearing and vegetation removal. In general, these developments would directly impact vegetation and associated wildlife by removing habitats and fragmenting the remaining habitats, which would restrict potential wildlife movements. However, the enforcement of FAR standards to control overall density of the developments would minimize impacts. Only a small portion of the total land set aside for a specific development project would actually be used; most would be maintained in its present ecological condition. Moreover, the principal affected habitat type would be planted slash pine, which is widespread and very common at NAS Cecil Field and throughout northeastern Florida. Therefore, overall impacts to upland vegetation and wildlife would not be significant.

Wetland Vegetation and Wildlife

Based on the lack of significant change in land use or management proposed by the Preferred Reuse Plan, the overall wetland vegetation and wildlife would continue to exist in its present state. The existing forestry management plan provides for periodic harvesting of forested wetland stands including wetlands dominated by pines, deciduous broad-leaved trees, and cypress. The removal of trees alters the vegetation composition and structure, wildlife use, and hydrologic patterns of wetlands. Scrub/shrub and emergent wetlands are not altered by forestry practices.

Overall, land uses proposed in the Preferred Reuse Plan would not result in significant impacts to wetlands as identified on National Wetland Inventory maps. Section 4.1 presents a constraints analysis to determine if projected development could be reasonably developed on lands without sensitive environmental features. Wetland areas were a main constraint feature included in this analysis. Due to the large amount of nonwetland area that

could be developed and the limited amount of proposed development, it is unlikely that encroachment into wetlands would be required to accommodate development. The majority of wetland areas in the Yellow Water Area are located in the northwest portion, which would continue to be managed for forestry. Maintenance of the present land uses at the Main Station would not directly impact wetlands.

However, proposed long-term development could potentially impact wetlands, especially the light and heavy industrial development in the eastern side of the Yellow Water Area. This portion of the Yellow Water Area contains sizeable hardwood, cypress, pine, and scrub/shrub wetlands. However, the relatively small amount of land that would actually be developed compared to the total area set aside for development should allow projects to be located on upland areas. In addition, the long-term continued implementation of the forestry management plan throughout much of the western side of the Yellow Water Area and the east side of Main Station would maintain the most extensive wetland systems on the station. Therefore, significant direct encroachment upon wetlands would be unlikely.

Field surveys would need to be conducted by developers in accordance with applicable federal, state, and local regulations after site-specific development plans are formed to determine the extent of wetlands. As specific development plans are proposed near known wetland areas, wetland delineations will need to be conducted by the developer to determine specific wetland boundaries in relation to proposed developments and to ensure that wetland areas will be preserved and maintained.

Threatened and Endangered Species

Continued implementation of the present forestry management plan throughout most of the Yellow Water Area and much of Main Station in the interim would maintain the presence of suitable habitat for species of concern discussed in Section 3.3, such as the gopher tortoise, Florida pine snake, eastern indigo snake, Florida mouse, Sherman's fox squirrel, and Bachman's sparrow in the drier pinelands. Although only the gopher tortoise, Sherman's fox squirrel, and Bachman's sparrow have been confirmed on the station, the extent of suitable habitat for these species of concern makes it possible that other species occur on the station (see Section 3.3). Continued periodic harvesting and prescribed burning of selected pinelands would create habitats that would benefit these species at a variety of developmental stages. Longer rotation times between harvests and increased prescribed burning, especially at the Yellow Water Area, would further increase the value of the pinelands to these species of concern. In addition, the burning of pine habitats around certain emergent and cypress wetlands on the Yellow Water Area could increase potential breeding habitat for the flatwoods

salamander by favoring the growth of wiregrass. Subsequent to the harvesting of the drier areas on the Main Station, replanting with longleaf pine instead of the current slash pine would further increase habitat suitability for the aforementioned species of concern.

Proposed long-term development could potentially impact suitable habitats and individual species. For example, grading for building construction could cause mortality to gopher tortoises occupying their burrows, and the development of light industrial activities at the existing ordnance storage area could result in a loss of suitable foraging habitat for the southeastern American kestrel. In addition, fragmentation of suitable habitats, especially by large developments and transportation corridors, could be a significant indirect impact. However, the most intensive development would require relatively small areas; proper project siting could avoid suitable habitats. In general, most of the suitable habitat for species of concern occurs on the Main Station, whereas much of the long-term new development is planned to occur at the Yellow Water Area. Based on the presence of species of concern and suitable habitats at the station, developers would be required to conduct additional consultation with the USFWS and FGFWFC and/or additional surveys would likely be required prior to development.

4.3.2 Alternative Reuse Scenario 1

Overall, ARS 1 would result in the fewest impacts to terrestrial resources because of the minimal amount of redevelopment. Some existing facilities would be maintained, and new development would be minimal relative to the other reuse plans.

Upland Vegetation and Wildlife

ARS 1 would not result in significant changes to existing development patterns. The proposed uses at the Main Station would occur within existing structures, aviation facilities including runways, other developed areas, and maintained lawn. In addition, the golf course and other recreational lands on the Main Station (e.g., Lake Fretwell) would continue to be maintained in their present condition with no impacts to the vegetation or wildlife.

The remaining lands, consisting of virtually all of the Yellow Water Area and most of the Main Station, would be used for passive recreation and forestry purposes. The resultant extensive greenspace could serve as an important wildlife travel corridor between Cary State Forest, which is approximately 6 miles due north of the Yellow Water Area, the Jennings

State Forest, which borders the south side of Main Station, and Camp Blanding, which borders Jennings State Forest.

Wetland Vegetation and Wildlife

Based on the lack of significant change in land use or management proposed by ARS 1, wetland vegetation and wildlife would not be affected. Continued implementation of the forestry management plan would not alter the ecological integrity of the wetland systems.

Threatened and Endangered Species

Implementation of ARS 1 would not impact the present distribution of species of concern at the station or the suitability of habitats. The continued uses of the Main Station, including maintenance of the airstrips and forestry management, are compatible with maintenance of habitat suitable for inhabitants of dry pinelands.

4.3.3 Alternative Reuse Scenario 2

Implementation of ARS 2 would result in predominantly minor overall impacts to existing biological resources. Most of the station would be maintained in its present state for forestry purposes, existing facilities would continue to be used, and limited new development would occur in disturbed portions of the Main Station and Yellow Water Area.

Upland Vegetation and Wildlife

Under ARS 2, the dominant land use would be forestry. Therefore, vegetation and wildlife resources would continue without significant variation from the current species distribution and composition. The planned market-driven development in the Main Station and Yellow Water Area would occur entirely within the already disturbed areas; therefore, the loss of vegetation would be minimal and would not impact the overall value of habitats to wildlife.

Wetland Vegetation and Wildlife

ARS 2 would not result in encroachment on wetlands. Continued implementation of the forestry management plan would not alter the ecological integrity of wetland systems. Only a small area of the existing Yellow Water ordnance area contains NWI wetlands. However, the small amount of acreage required for development, compared to the overall size

of the general area, would allow for the avoidance of wetland areas and prevent direct impacts to wetland resources.

Threatened and Endangered Species

Impacts to suitable habitat for species of concern would be similar to those resulting from current operations. Continued forestry management practices would maintain the habitat suitability for the species of concern. The market driven development in the Yellow Water Area would result in the loss of suitable foraging habitat for the southeastern American kestrel. However, the actual area required for development compared to the areas that would remain undisturbed is minor.

4.3.4 Alternative Reuse Scenario 3

Compared to the other ARSs, ARS 3 would result in a greater disturbance of upland habitats, wetland habitats, and suitable habitats for species of concern. In particular, direct impacts could occur to wetlands through possible hydrologic alterations, and indirect impacts could occur to wildlife through restricted movement and habitat fragmentation.

Upland Vegetation and Wildlife

ARS 3 would result in widespread impacts to upland vegetation and wildlife, particularly at the Main Station. Residential development in the eastern part of the Main Station would cause the removal of much of the forest, thereby minimizing the value of this area to wildlife. Manufacturing facilities, commercial development, and light industrial developments would constitute relatively intensive land uses and potentially cause the loss of more upland habitat than the other ARSs. The creation of a conservation area in the southern portion of the Main Station would retain a sizeable area in its present land cover, which is primarily dry pinelands with scattered hardwood wetlands.

Wetland Vegetation and Wildlife

Wetlands would be directly impacted by several proposed developments associated with ARS 3. Residential development, which is the most intensive land use of this proposed reuse plan, would encroach upon numerous acres of hardwood, cypress, and scrub/shrub wetlands in the eastern section of the Main Station. Additional indirect impacts could result from potential alterations of hydrology. Most of the Yellow Water Area is designated for light industrial and manufacturing activities. Over half of this area is mapped as wetland, and

encroachment upon wetlands would likely occur despite the modest FARs. Creation of the conservation area on the Main Station would preserve some hardwood and pine wetlands.

Threatened and Endangered Species

ARS 3 would potentially result in the direct loss of much suitable habitat for several species of concern including the gopher tortoise, Florida mouse, eastern indigo snake, Sherman's fox squirrel, Florida pine snake, Bachman's sparrow, numerous plant species in drier habitats, and possibly the wood stork in wetland areas. Proposed development on the Main Station would probably cause direct impacts to individual gopher tortoises through mortality or significant alteration of occupied habitats. In addition, developments throughout the station would fragment suitable habitats, thereby restricting movement of most species of concern. Individuals that are not directly impacted would be isolated from other individuals, potentially resulting in significant impacts to the local population through decreased reproduction. The proposed conservation area south of the Main Station and adjacent to the Brannan Field Mitigation Bank would create a sizeable conservation area, and would somewhat offset overall impacts to species of concern.

4.3.5 Alternative Reuse Scenario 4

Impacts resulting from the implementation of ARS 4 would be similar to the Preferred Reuse Plan.

4.3.6 Cumulative Impacts

Reasonably foreseeable actions that would affect terrestrial resources in the vicinity of the NAS Cecil Field property include:

- Actions taken by the State of Florida to establish a natural corridor between the Cary State Forest and the Jennings State Forest; and
- Actions taken by the City of Jacksonville to establish a Wildlife Management Area adjoining the southeast portion of the station property.

When combined with planned actions associated with the preferred Reuse Plan, the abovementioned actions could result in beneficial cumulative impacts to terrestrial resources in the vicinity of the station property. The Preferred Reuse Plan encourages and supports the establishment of a natural corridor through the station property on lands not well suited for new development (e.g., wetlands, floodplains, etc.). Also, the plan includes a sizeable

conservation area that would abut the city's planned Wildlife Management Area. Cumulatively, these actions would significantly contribute to the state's goal of creating a natural corridor in this area, while allowing sensitive development of station property.

4.3.7 Mitigation Measures

Upon completion of the federal actions necessary to finalize the disposal of NAS Cecil Field, the station property would be available for reuse/development activities, and be the subject of Florida development and natural resource regulations. The FGFWFC would ensure that all reuse activities fulfill permit requirements regarding both state and federally listed species of concern likely to be impacted by the proposed reuse action. In addition, the ultimate receiving entity would implement the CFDC's Forestry Management Plan developed for NAS Cecil Field in the areas designated for such use in the Preferred Reuse Plan.

Reuse and redevelopment of NAS Cecil Field would also be subject to the provision of the Conservation/Coastal Management Element requirements of the Jacksonville Comprehensive Plan. The relevant issues include: conservation and protection of riverine wetlands, conservation and protection of native plant communities, protection of wildlife, and impact on wetlands. The policies also require the maintenance of ecological functions of upland and wetland habitats.

Regarding conservation and protection of native plant communities, Objective 3.3 of the plan is:

> To "conserve, appropriately use, protect, and manage environmentally sensitive lands (native plant communities and wildlife habitat) to maintain the natural ecological community types and sustainable population of wildlife native to the City [of Jacksonville]."

Regarding the protection of wildlife, Objective 3.5 of the plan is:

> To "protect and manage endangered, threatened, and species of special concern so there is no reduction in numbers of species that are found in the City and no significant loss of population size. Conserve and protect the functional values of areas of native wildlife habitats which require species protection efforts."

Regarding the protection of wetlands, under Objective 4.1 of the plan certain development is permitted provided that the following standards are met:

- **Encroachment** in the riverine/estuarine wetlands is the least damaging to the wetlands and that no practicable on-site alternative exists; and

- The development is designed and located in such a manner that there is **no net loss** to the wetland functions.

All new development on the station property would be subject to review and approval through the local permitting process. This process will ensure that development will be conducted consistent with the city conservation policies.

In addition to local conservation policies, individual projects under the Preferred Reuse Plan would be subject to state and federal regulatory programs, depending on the type and scale of development proposed. Individual developers would be responsible for obtaining reviews and permits prior to project implementation. For example, new projects could be subject to permitting under the Clean Water Act if they could potentially affect wetlands under the jurisdiction of USACE.

4.4 Water Quality and Hydrology

4.4.1 Preferred Reuse Plan

Surface Water Hydrology

No significant impacts to surface water hydrology are anticipated from implementation of the Preferred Reuse Plan. All development proposed for the property would be undertaken pursuant to the jurisdiction of the *Jacksonville 2010 Comprehensive Plan* and would therefore be subject to policies, goals, and guidelines which ensure continuing natural functions of waterbodies, wetlands, and floodplains, as well as attainment of water quality standards.

To preserve and protect the significant wetlands on the station and provide natural connections to off-site wetland areas, the Preferred Reuse Plan limits the amount of development in environmentally sensitive areas and allows for the preservation of natural areas. No new realignment of streams or physical alteration of wetland systems is anticipated as a result of implementing the Preferred Reuse Plan; therefore, no impacts to surface water flow patterns or reduction of flood retention capacity are anticipated.

The station currently has a well developed system of primarily open drainage systems. However, many of the open ditches and swales indicate restricted flows resulting from a lack of maintenance and sediment removal. As new areas of the station are open for

development, primarily in the Yellow Water area, additional storm water collection, conveyance and outfall systems will be required to be installed (see Section 4.9, Infrastructure). Redevelopment would not result in a significant increase in storm water runoff off site because appropriate storm water management practices would be implemented.

Water Quality

Implementation of the Preferred Reuse Plan is unlikely to result in adverse effects to water quality. The proposed plan is not expected to affect streams located on the station property, which are classified as Class III waterbodies by FDEP. (FDEP classification designates waterbodies for recreation, propagation, and maintenance of a healthy well-balanced population of fish and wildlife.) Eventual deactivation of the station's wastewater treatment plant (WWTP) would improve water quality through the elimination of effluent discharge and a reduction of nutrient loads to Rowell Creek. Therefore, long-term improvement to water quality is anticipated.

Potential surface water quality impacts may result from industrial storm water discharge, or from normal maintenance and use of developed areas (e.g., herbicide and insecticide use, increased levels of oil and gas in storm water runoff from roads and parking lots). Following property transfer, industrial storm water discharge permits will be required by EPA. A Storm water Pollution Prevention Plan and Illicit Discharge Report will be required for future land use development on the station property.

Adverse impacts to surface water quality could potentially result from the various types of industrial uses through accidental or unpermitted discharges. However, heavy industrial uses are anticipated to be in the form of clean modern manufacturing operations. Furthermore, industrial use development is proposed to occupy less than 10% of the overall land area.

Groundwater

The Preferred Reuse Plan would not impact the availability of groundwater in the area or the quality of the water withdrawn. Most potable water in Duval County is obtained from wells which tap into the Floridian Aquifer. Principal recharge to the Floridan aquifer occurs in an area in the lakes region of southwestern Clay County, eastern Bradford County, and western Alachua County, where the confining beds are either thin or missing. Little or no recharge of the Floridian aquifer occurs near NAS Cecil Field. An increase in impervious surface area resulting from development would not significantly decrease the amount of water recharged into the Floridian aquifer.

The potable water system at NAS Cecil Field currently operates independently of the municipal system. However, it is anticipated that the station will be connected to the city's potable system in September/October 1997 (Lund 1996). Until the station property is connected with the city's potable water supply system, increased, reduced, or changed use of the potable water supply may necessitate a change in consumptive-use permits (obtained from the St. Johns River Water Management District [SJRWMD]). Overall, implementation of the Preferred Reuse Plan and fulfillment of its associated consumptive use permits would not cause an exceedance of safe aquifer yields.

The reuse plan does not propose development on any of the identified contaminated sites located on the station property. Overall, remediation of contaminated groundwater areas will result in improvements to groundwater quality.

4.4.2 Alternative Reuse Scenario 1

Surface Water Hydrology

Implementation of ARS 1 would not result in any adverse impacts to surface water hydrology or flood retention capacity in the vicinity of the station because existing conditions would be maintained. No new realignment of streams or physical alteration of wetland systems would result from this scenario.

Water Quality

Implementation of ARS 1 would not result in any adverse impacts to water quality in the vicinity of the station. Eventual deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek, which will improve water quality. Forestry would continue to use best management practices, and proper erosion control measures to prevent the possibility of agriculture runoff would continue.

Groundwater

Implementation of ARS 1 would not result in any adverse impacts to the availability of groundwater in the area or the quality of water withdrawn because existing conditions would be essentially maintained. Remediation of contaminated groundwater areas identified during the RFI process will result in improvements to groundwater quality.

4.4.3 Alternative Reuse Scenario 2

Surface Water Hydrology

Based on the limited amount of new development planned, implementation of ARS 2 should not result in any adverse impacts to surface water hydrology or flood retention capacity in the vicinity of the station. No new realignment or physical alteration of streams or wetland systems would result from this scenario.

Water Quality

Implementation of ARS 2 would not result in any adverse impacts to water quality. Deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek, and it would ultimately result in improved water quality. Minor surface water quality impacts may occur from normal maintenance and use of developed areas, including herbicide and insecticide use, and oil and gas in storm water runoff from roads, parking lots, and aviation areas. However, these effects would be less significant than under pre-closure conditions.

Groundwater

Implementation of ARS 2 would not result in any adverse impacts to the availability of groundwater in the area or the quality of water withdrawn. It is anticipated that the station will be connected to Jacksonville's potable system in September/October 1997 (Lund 1996). Until the station is connected with the city's potable water supply system, increased, reduced, or changed use of the potable water supply may necessitate a change in consumptive-use permits. Fulfillment of consumptive-use permits will not cause an exceedance of safe aquifer yields. The remediation of contaminated groundwater areas will result in improvements to groundwater quality.

4.4.4 Alternative Reuse Scenario 3

Surface Water Hydrology

Implementation of ARS 3 would potentially impact the surface water hydrology and flood retention capacity on the station property. The development of large tracts of land for manufacturing/light industrial and planned residential projects would potentially result in realignment of streams or physical alteration of wetland systems. The significance of impacts

from construction and operation of this scenario would depend on the final design. Depending on the extent of development, this scenario would most likely alter natural sheet flow and flow characteristics of streams as a result of the increase in impervious surface area.

Water Quality

Development of large tracts of land for manufacturing, light industrial, residential, and commercial projects may result in an increased use of pesticides, insecticides, or herbicides for lawn care, and increased levels of oil and gas in storm water runoff from roads and parking lots. Furthermore, increased water flow intensity and sediment loads resulting from increased runoff velocity over impervious and newly cleared areas may occur from development of large tracks of land for industrial projects. Deactivation of the WWTP would eliminate treated sewage effluent discharge and reduce nutrient loads into Rowell Creek and ultimately result in improved water quality.

Groundwater

Implementation of ARS 3 would not impact the availability of groundwater in the area. The development of large tracts of land for industrial, residential, and commercial projects would potentially increase the amount of impervious surfaces in the area, and consequently, decrease the amount of recharge to the surficial and intermediate aquifers through soil infiltration. However, the Floridian aquifer system would not be affected because little or no recharge of significant groundwater occurs near the station.

It is anticipated that the Base will be connected to the city's potable system in September/October 1997 (Lund 1996). Until the station is connected with the city's potable water supply system, an increased, reduced, or changed use in the potable water supply may necessitate a change in consumptive-use permits. Fulfillment of consumptive-use permits will not cause an exceedance of safe aquifer yields. Remediation of contaminated groundwater areas identified will result in improvements to groundwater quality.

4.4.5 Alternative Reuse Scenario 4

Implementation of ARS 4 would result in similar impacts as those discussed for the Preferred Reuse Plan.

4.4.6 Cumulative Impacts

Other than the eventual discontinuation of various activities associated with the use of NAS Cecil Field as a naval airfield (e.g., operation of independent WWTP and potable water facilities), there are no reasonably foreseeable actions in the region that would result in cumulative impacts to water resources when combined with the effects of the Preferred Reuse Plan.

Based on careful planning and conservation of sensitive areas, the Preferred Reuse Plan would not result in significant cumulative impacts to surface water hydrology, water quality, or groundwater resources in the Jacksonville area. All development proposed for NAS Cecil Field will be under the jurisdiction of the *Jacksonville 2010 Comprehensive Plan*; therefore, it will be subject to policies, goals, and guidelines which ensure continuing natural functions of waterbodies, wetlands, and floodplains, as well as attainment of water quality standards. All appropriate federal, state, and county permits will be obtained under this development plan in order to protect these resources. With the construction of additional impervious surfaces, additional storm water control structures would be necessary on the property. However, base station redevelopment would not result in significant increases in storm water runoff in the Jacksonville area.

4.4.7 Mitigation Measures

Site-specific mitigation for impacts to surface water hydrology and groundwater quality would be developed by individual redevelopers during the EPA, USACE, FDEP, and SJRWMD permitting processes following submission of individual project plans and detailed specifications.

4.5 Climate and Air Quality

4.5.1 Climate

Neither the Preferred Reuse nor any of the ARSs would have a significant impact on local or regional climate conditions.

4.5.2 Air Quality

Air quality impacts of the Preferred Reuse Plan and ARS 1, ARS 2, ARS 3, and ARS 4 must comply with any federal, state or local agency regulations based on the Clean Air Act as amended in 1990. Major regulations that may apply are construction and operating permit procedures for stationary air pollution emitting sources and emission standards such as

the New Source Performance Standards and control technology standards. Developers of future facilities are responsible for obtaining the proper permits prior to development.

Duval County has been designated as an ozone maintenance area (see Section 3.5); therefore, any action must comply with the air quality maintenance plan in Florida's SIP. The General Conformity Rule applies to actions that occur in maintenance and nonattainment areas. This action was analyzed for applicability of the General Conformity Rule.

As discussed in Section 3.5.2.2, transfers of land under certain conditions are exempt from General Conformity Rule applicability. One of the conditions for exemption is complete transfer of land. After the transfer, the Federal agency involved in the action does not retain authority to control air pollutant emissions associated with these lands, nor does it retain authority over any facilities developed or located on these lands. This exemption applies to the reuse of NAS Cecil Field because the Navy anticipates complete transfer of lands and facilities to other parties. Thus, this action is exempt from the General Conformity Rule.

Although exempted from the analysis requirements of the General Conformity Rule, NEPA requirements still apply. As such, this DEIS addresses potential impacts to air quality.

Because ozone is the main pollutant of concern in Duval County, the focus of the air quality analysis is on emissions of VOCs and NO_x, which are the pollutants that react to form ozone. Analyses are also presented for carbon monoxide (CO) and particulate matter (PM) emissions from mobile and stationary sources and construction/demolition activities. Pre-closure and projected total annual emissions of VOCs, NO_x, CO, and PM were compared to evaluate the impacts to air quality from the proposed action. The latest emission factors published by the EPA for aircraft and mobile sources and construction/demolition were used for the analysis.

Emissions were estimated for personally owned vehicles (POVs) for the Preferred Reuse Plan and each ARS. Estimated future trip generation data were distributed according to current NAS Cecil Field employee trip distribution (see Sections 3.7, 3.8 and 4.8). Daily trip data presented in Sections 3.8 and 4.8 are one-way trip counts. Round-trip (RT) counts were determined by dividing the total number of one-way trips (inbound and outbound) by two. An average round-trip commuting distance was determined based on the distance from a central location in Duval (10.9 miles) and Clay (30.3 miles) counties. For the small percentage of trips originating outside of these two counties, an average RT commuting distance of 50 miles was assigned. The number of daily vehicle miles travelled (VMT) was determined by multiplying the number of daily trips from each location by the RT distance. The annual VMT was determined by multiplying the daily VMT by 240 work days per year.

VOC, NO_x and CO emission factors (grams/mile) for model year 1999 (EPA 1992) were applied to the annual VMT to determine annual emissions.

Aircraft emission estimates were based on estimated future aircraft operations and emission factors for aircraft chosen as representative of the aircraft classes included in future operations. Estimated future aircraft operations are shown in Table 4-6. These operations levels apply to the Preferred Reuse Plan, and ARS 2, and ARS 4. Aircraft operations under ARS 1 consist only of helicopters (AH-64, UH-60, and OH-58). No aircraft operations are included in ARS 3.

Emission estimates for ground operation of aircraft include idling and taxiing, take-off/climbout up to 3,000 feet; approach/landing, taxiing in, and idling. Emission factors are based on fuel usage and operating mode (e.g., take-off, climbout, etc.). Fuel use is determined by multiplying the fuel use rate by the time spent in each operating mode. Emission factors for aircraft are shown in Table 4-7 (EPA 1992a). Commercial aircraft use of the airfield was specified by the CFDC as "single engine piston" through "large jet" aircraft. For these aircraft classes, representative aircraft models for which published emission factors exist were used.

Emissions were estimated for full LTO cycles and touch-and-go (T&G) operations. Since taxiing in and out and idling do not occur for T&G operations, the emissions produced under these conditions were not calculated. Total annual emissions of VOC and NO_x were determined by summing the emissions generated by each operating mode for annual LTO and T&G operations and each aircraft type.

Stationary source emissions were estimated for major sources expected to be included in any reuse scenario. Emission estimates were obtained from the existing emission inventory for NAS Cecil Field (Navy 1995) and assumed to represent emission levels in future years. Selection of which sources to include in each reuse scenario was based on best engineering judgement. For example, if significant aircraft activity is part of a reuse scenario, then emissions associated with aircraft maintenance activities are included. A boiler plant is included in the stationary source inventory for future facilities requiring steam for heat or hot water (e.g., a correctional institution).

Construction and demolition (C&D) emission estimates are based on the anticipated new structural floor space requirements shown in Tables 2-2, 2-5, 2-7, 2-9, and 2-11. Emissions of VOCs and NO_x are generated by heavy construction equipment. Particulate emissions result from mechanical disturbance of structures and soil. Construction of structural floor space was evenly divided over the five-year period of each phase.

Table 4-6

ESTIMATED FUTURE AIRCRAFT OPERATIONS FOR THE PREFERRED REUSE PLAN, ARS 1, ARS 2, AND ARS 4

Aircraft Type	Annual Operations[a]			
	Phase 1 (1998-2004)		Phase 2 (2005-2010)	
	Takeoff and Landings	Touch-and-Go	Takeoff and Landings	Touch-and-Go
AH-64 (Helicopter)	1,450	475	3,300	1,200
UH-60 (Helicopter)	425	175	875	300
OH-58 (Helicopter)	1,325	325	875	250
Single Engine Piston (Cessna 150)	10,000	2,000	15,000	2,500
Twin Engine Piston (Cessna 337)	10,000	2,000	20,000	2,500
Turbo Prop (DeHavilland DHC 6)	15,000	2,000	25,000	2,500
Corporate Jet (Lear 31)	15,000	0	20,000	0
Large Jet (Boeing 737-300)	5,000	0	10,000	0

[a] ARS 1 contains only those helicopter operations listed.

Source: CFDC 1996.

Table 4-7

EMISSION FACTORS FOR AIRCRAFT BY OPERATING MODE

Aircraft	Number of Engines	Engine Model	Mode	Fuel Flow (lb/min)	Emissions (lb/1,000 lb fuel)	
					VOCs	NO_x
AH-64 (Helicopter)	2	T58-GE-5	Taxi-out/idle	2.2	97	1.5
			Climbout	14.8	0.8	7.2
			Approach	14.8	0.8	7.2
			Taxi-In/idle	2.2	97	1.5
UH-60 (Helicopter)	1	T58-GE-5	Taxi-out/idle	2.2	97	1.5
			Climbout	14.8	0.8	7.2
			Approach	14.8	0.8	7.2
			Taxi-In/idle	2.2	97	1.5
OH-58 (Helicopter)	1	T58-GE-5	Taxi-out/idle	2.2	97	1.5
			Climbout	14.8	.0.8	7.2
			Approach	14.8	0.8	7.2
			Taxi-In/idle	2.2	97	1.5
Cessna 150	1	O-200	Taxi-out/idle	0.14	29.0	1.58
			Takeoff	0.75	20.8	4.87
			Climbout	0.75	20.8	4.87
			Approach	0.43	33.2	1.14
			Taxi-In/idle	0.14	29.0	1.58
Cessna 337	2	TSIO-360C	Taxi-out/idle	0.19	138.26	1.91
			Takeoff	2.22	9.17	2.71
			Climbout	1.66	9.55	4.32
			Approach	1.02	11.31	3.77
			Taxi-In/idle	0.19	138.26	1.91
DHC 6	2	PT6A-27	Taxi-out/idle	1.92	50.2	2.4
			Takeoff	7.1	0	7.8
			Climbout	6.7	0	7.0
			Approach	3.6	2.2	8.4
			Taxi-In/idle	2.0	50.2	2.4

Key at end of table.

Table 4-7

EMISSION FACTORS FOR AIRCRAFT BY OPERATING MODE

Aircraft	Number of Engines	Engine Model	Mode	Fuel Flow (lb/min)	Emissions (lb/1,000 lb fuel)	
					VOCs	NO_x
Lear 31	2	TFE731-2	Taxi-out/idle	3.17	20.04	2.82
			Takeoff	27.12	0.11	15.25
			Climbout	22.88	0.13	13.08
			Approach	8.86	4.26	5.9
			Taxi-In/idle	3.17	20.04	2.82
Boeing 737-300	2	CFM-56-3	Taxi-out/idle	16.01	1.83	3.9
			Takeoff	134.92	0.04	18.5
			Climbout	111.51	0.05	16.0
			Approach	44.71	0.1	8.4
			Taxi-In/idle	16.01	1.83	3.9

Key:

lb = Pounds.
NO_x = Oxides of nitrogen.
VOCs = Volatile organic compounds.

Source: EPA 1992a.

Three phases in the development of new facilities—demolition, site preparation, and construction—were analyzed for emission generation. New construction is assumed to occur on previously developed land; therefore, demolition of existing structures occurs prior to new construction. Particulate emissions generated by demolition are based on actual structural floor space removed (assumed equal to new floor space to be constructed) and emission factors for structure take-down, debris removal, and vehicular activity (EPA 1992).

Heavy construction equipment engine emissions (VOCs and NO_x) are based on emission factors (EPA 1992a) and best engineering estimates of the types and quantities of equipment required for demolition.

VOC, NO_x, and PM emissions generated by site preparation activities are based on best engineering estimates of the type and quantity of equipment used and the duration of activities. Site preparation and construction activities generally require more acreage than the actual building footprint because of the need for logistical and operational activities such as equipment and material storage and space to operate equipment and vehicles. Building footprint estimates were doubled to account for this extra space requirement.

Site preparation emission estimates were calculated following this procedure for the Preferred Reuse Plan. For each ARS, emissions were increased or decreased based on the ratio of acreage involved in each ARS compared to acreage involved in the Preferred Reuse Plan. Construction emission estimates were also calculated in this manner.

4.5.2.1 Preferred Reuse Plan

The primary air emission sources are expected to be aircraft, mobile source activity to and from the property, construction activities, and aircraft maintenance facilities. Table 4-8 presents estimated annual emissions from aircraft operations for Phase 1 (1998 to 2004) and Phase 2 (2005 to 2010) of the Preferred Reuse Plan. Mobile source (vehicle) emission estimates for the Preferred Reuse Plan are shown in Table 4-9. These estimates are based on 1999 mobile source emission factors, estimates of average daily trips, and 240 workdays per year. Emissions associated with C&D activities are presented in Table 4-10.

Summaries of projected emissions for the Preferred Reuse Plan and pre-closure emissions are presented in Table 4-11. As noted, VOC emissions would decrease by 422 tons per year from pre-closure conditions to the completion of Phase 2. Emissions of NO_x during the same period would decrease by 250 tons per year.

From pre-closure conditions to completion of Phase 2, annual emissions of CO would increase by 407 tons per year. Annual emissions of PM would increase by 82 tons per year. The increase in CO emissions is primarily a result of the increase in the VMT by employees

Table 4-8

EMISSION ESTIMATES FOR AIRCRAFT OPERATIONS FOR THE PREFERRED REUSE PLAN (tons/year)

Aircraft	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
	VOCs		NO_x		VOCs		NO_x	
	Touch-and-Go	Full LTO	Touch-and-Go	Full LTO	Touch-and-Go	Full LTO	Touch-and-Go	Full LTO
AH-64	0.1	2.4	0.7	2.0	5.4	0.2	4.7	1.7
UH-60	0	0.7	0.2	0.6	1.4	0	1.2	0.4
OH-58	0.1	2.2	0.5	1.9	14.0	0	1.2	0.3
Piston 1 Engine	0.2	1.2	0	0.1	1.8	0.2	0.2	0
Piston 2 Engine	0.3	5.7	0.1	0.7	11.5	0.4	1.3	0.2
Turbo prop	0.1	38.1	0.6	6.0	63.5	0.1	10.0	0.7
Corporate Jet	0	13.3	0	7.7	17.8	0	10.3	0
Large Jet	0	4.0	0	44.0	8.0	0	88.0	0
Total	0.8	67.6	2.1	63.0	123.4	0.9	116.9	3.3

Key:

LTO = Landing and takeoff.
NO_x = Oxides of nitrogen.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-9

VEHICLE EMISSION FACTORS, ANNUAL VMT, AND EMISSIONS FOR THE PREFERRED REUSE PLAN

Development Phase	Vehicle Emission Factors (grams/mile)			Annual VMT	Total Emissions (tons/year)		
	VOCs	NO_x	CO		VOCs	NO_x	CO
Phase 1	1.58	2.23	21.05	20,574,965	36	51	477
Phase 2	1.58	2.23	21.05	55,493,549	97	136	1,288

Key:

CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
VMT = Vehicle miles travelled.
VOCs = Volatile organic compounds.

Sources: EPA 1992; E & E 1996.

Table 4-10

ANNUAL CONSTRUCTION AND DEMOLITION EMISSIONS FOR THE PREFERRED REUSE PLAN (tons/year)

Activity	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
	Acreage[a]/year	VOCs	NO_x	PM	Acreage[a]/year	VOCs	NO_x	PM
Demolition[b]	13.8	1.0	7.2	1.8	21.6	1.6	11.3	2.8
Site Prep[c]	13.8	0.7	5.7	0.5	21.6	1.1	8.9	0.6
Construction[d]	13.8	1.4	11.0	66	21.6	2.2	17.2	104
Total	NA	3.1	23.9	68.3	NA	4.9	37.4	107.4

a Acreage used in site preparation and construction calculations is total disturbed land (twice construction footprint).

b Demolition assumed to require four haul trucks, two bulldozers, two front-end loaders, and two backhoes for a 120-day period each year.

c Site preparation assumed to require four haul trucks, two graders, two bulldozers, two front-end loaders and one excavator for 90 days each year.

d Construction assumed to require two small cranes, two hi-lifts, two compactors, one paver, two rollers, and five haul trucks for 120 days each year.

Key:

NA = Not applicable.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-11

AIR POLLUTANT EMISSIONS SUMMARY FOR THE PREFERRED REUSE PLAN (tons/year)

Emission Source	VOCs	NO_x	CO	PM
Pre-closure	711	552	883	25
Phase 1				
Aircraft	68.4	65.1	—	—
Stationary	63	9	2	—
Construction	3	24	—	68
Mobile	36	51	477	—
Total	170.4	149.1	479	68
Net change from pre-closure	-540.6	-402.9	-404	+43
Phase 2				
Aircraft	124.3	120.2	—	—
Stationary	63	9	2	—
Construction	5	37	—	107
Mobile	97	136	1,288	—
Total	289.3	302.2	1,290	107
Net change from pre-closure	-421.7	-249.8	+407	+82

Key:

CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

^TSource: Ecology and Environment, Inc., 1996.

at the facility. The increase in PM emissions is solely a result of the C&D projects associated with the preferred alternative (see Table 4-10). Construction PM emissions would be temporary; they would cease upon completion of the proposed facilities.

4.5.2.2 Alternative Reuse Scenario 1

The primary air emission sources for ARS 1 are expected to be aircraft and mobile source activity to and from the former Cecil Field. Aircraft type is limited to helicopter use in this scenario; thus, emissions are only produced during take-off, landing, and T&G operations. The helicopter engine emissions presented in Table 4-12 were estimated by applying the emission factors in Table 4-7 to the estimated future aircraft operations in Table 4-6. New stationary source emissions are anticipated to be minimal because no major facilities that emit air pollutants are planned for construction.

Mobile source emission estimates for ARS 1 are shown in Table 4-13. These estimates are based on 1999 mobile source emission factors, estimates of average daily trips and 240 workdays per year. C&D emission estimates are shown on Table 4-14.

Summarized emissions for ARS 1 are compared to pre-closure levels in Table 4-15. At the completion of Phase 2, a substantial decrease in emissions of all compounds is anticipated.

4.5.2.3 Alternative Reuse Scenario 2

The primary air emission sources for ARS 2 are expected to be aircraft, mobile source activity to and from the former Cecil Field, and C&D activities. Table 4-8 presents estimated annual emissions from aircraft operations for Phase 1 and Phase 2 of the Preferred Reuse Plan. Aircraft emissions for ARS 2 would be identical to those in the Preferred Reuse Plan because aircraft activity and type would be the same for both scenarios. Stationary source emissions are expected to be significantly lower compared to pre-closure levels.

Mobile source emission estimates are shown in Table 4-16. These estimates are based on 1999 mobile source emission factors, estimates of average daily trips, and 240 workdays per year. C&D emission estimates are shown in Table 4-17.

Summaries of projected emissions for ARS 2 are compared to pre-closure levels in Table 4-18. Emissions decrease significantly from pre-closure conditions to completion of Phase 2. VOC emissions decrease by 491 tons per year; NO_x emissions decrease by 374 tons per year; and PM emissions decrease by 7 tons per year. CO emissions would decrease by 457 tons per year.

Table 4-12

AIRCRAFT EMISSIONS ESTIMATE FOR ARS 1 (tons/year)

Aircraft	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
	VOCs		NO_x		VOCs		NO_x	
	T&G	LTO	T&G	LTO	T&G	LTO	T&G	LTO
AH-64	0.1	2.4	0.7	2.0	0.2	5.4	1.7	4.7
UH-60	0.0	0.7	0.2	0.6	0.0	1.4	0.4	1.2
OH-58	0.1	2.2	0.5	1.9	0.0	1.4	0.3	1.2
Total	0.2	5.3	1.4	4.5	0.2	8.2	2.4	7.1

Key:

ARS = Alternative Reuse Scenario.
LTO = Landing and takeoffs.
NO_x = Oxides of nitrogen.
T&G = Touch-and-go.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-13

VEHICLE EMISSION FACTORS, ANNUAL VMT, AND EMISSIONS FOR ARS 1

Development Phase	Vehicle Emission Factors (grams/mile)			Annual VMT	Total Emissions (tons/year)		
	VOCs	NO_x	CO		VOCs	NO_x	CO
Phase 1 (1998-2004)	1.58	2.23	21.05	22,617,747	39	56	525
Phase 2 (2005-2010)	1.58	2.23	21.05	27,529,744	48	68	639

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
VMT = Vehicle miles travelled.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-14

ANNUAL CONSTRUCTION AND DEMOLITION AIR EMISSIONS FOR ARS 1 (tons/year)

Activity	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
	Acreage[a]/year	VOCs	NO_x	PM	Acreage[a]/year	VOCs	NO_x	PM
Demolition[b]	2.3	0.17	1.2	0.3	2.3	0.17	1.2	0.3
Site Prep[c]	2.3	0.12	0.95	0.1	2.3	0.12	0.95	0.1
Construction[d]	2.3	0.23	1.8	11.0	2.3	0.23	1.8	17.3
Total	NA	0.52	3.95	11.4	NA	0.52	3.95	17.7

a Acreage used in site preparation and construction calculations is total disturbed land (twice construction footprint).
b Demolition structural floor space assumed equal to new construction floor space. Emission calculations based on EPA 1992.
c Site preparation assumed to require 15 days/year.
d Construction assumed to require two small cranes, two hi-lifts, two compactors, one paver, two rollers, and five haul trucks for 120 days each year. Based on ratio of acreages (13.8/2.3 = 6).

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-15

AIR POLLUTANT EMISSIONS SUMMARY FOR ARS 1 (tons/year)

Emission Source	VOCs	NO_x	CO	PM
Pre-closure	711	552	883	25
Phase 1 (1998-2004)				
Aircraft	5.5	5.9	—	—
Stationary	—	—	—	—
Construction	0.52	3.9	—	11.4
Mobile	39	56	525	—
Total	45	66	525	11.4
Net change from pre-closure	-666	-486	-358	-13.6
Phase 2 (2005-2010)				
Aircraft	8.4	9.5	—	—
Stationary	—	—	—	—
Construction	0.52	3.95	—	17.7
Mobile	48	68	639	—
Total	57	81	639	17.7
Net change from pre-closure	-654	-471	-244	-7.3

Key:

ARS = Alternative Reuse Scenario.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-16

VEHICLE EMISSION FACTORS, ANNUAL VMT, AND EMISSIONS FOR ARS 2

Development Phase	Vehicle Emission Factors (grams/mile)			Annual VMT	Total Emissions (tons/year)		
	VOCs	NO_x	CO		VOCs	NO_x	CO
Phase 1 (1998-2004)	1.58	2.23	21.05	9,890,207	17	24	229
Phase 2 (2005-2010)	1.58	2.23	21.05	18,262,427	32	45	424

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
VMT = Vehicle miles travelled.
VOCs = Volatile organic compounds.

Sources: EPA 1992; Ecology and Environment, Inc., 1996.

Table 4-17

ANNUAL CONSTRUCTION AND DEMOLITION AIR EMISSIONS FOR ARS 2 (tons/year)

Activity	Phase 1				Phase 2			
	Acreage[a]/yr	VOCs	NO_x	PM	Acreage[a]/yr	VOCs	NO_x	PM
Demolition[b]	2.3	0.17	1.2	0.3	2.3	0.17	1.2	0.3
Site Prep[c]	2.3	0.12	0.95	0.1	2.3	0.12	0.95	0.1
Construction[d]	2.3	0.23	1.8	11.0	2.3	0.23	1.8	17.3
Total	NA	0.52	3.95	11.4	NA	0.52	3.95	17.7

[a] Acreage used in site preparation and construction calculations is total disturbed land (twice construction footprint).

[b] Demolition structural floor space assumed equal to new construction floor space. Emission calculations based on EPA 1992.

[c] Site preparation assumed to require 15 days/year.

[d] Construction assumed to require two small cranes, two hi-lifts, two compactors, one paver, two rollers, and five haul trucks for 120 days each year. Based on ratio of acreages (13.8/2.3 = 6).

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-18

AIR POLLUTANT EMISSIONS SUMMARY FOR ARS 2 (tons/year)

Emission Source	VOCs	NO_x	CO	PM
Pre-closure	711	552	883	25
Phase 1				
Aircraft	68.4	65.1	—	—
Stationary	63	9	2	—
Construction	0.52	3.95	—	11.4
Mobile	17	24	229	—
Total	148.92	102.05	231	11.4
Net change from pre-closure	-562.08	-419.95	-652	-13.6
Phase 2				
Aircraft	124.3	120.2	—	—
Stationary	63	9	2	—
Construction	0.52	3.95	—	17.7
Mobile	32	45	424	—
Total	219.82	178.15	426	17.7
Net change from pre-closure	-491.18	-373.85	-457	-7.3

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

4.5.2.4 Alternative Reuse Scenario 3

The primary air emission sources from ARS 3 are expected to be mobile source activity to and from the station and C&D activities. Aircraft emissions do not occur under this scenario because no aircraft activity is proposed.

Stationary source emissions are expected to lower significantly compared to the pre-closure conditions.

Mobile source emission estimates are shown in Table 4-19. These estimates are based on 1999 mobile source emission factors, estimates of average daily trips and 240 workdays per year. C&D emission estimates are shown on Table 4-20. These estimates are based on new structural floor space requirements and development of residential housing areas.

Summaries of projected emissions for ARS 3 and pre-closure emissions are presented in Table 4-21. This table shows that from pre-closure to completion of Phase 2, annual emissions of VOCs would decrease 455 tons. NO_x emissions would increase by 118 tons annually. Annual emissions of CO would increase by 1,871 tons from pre-closure conditions to the completion of Phase 2. Annual PM emissions would increase by 1,029 tons from pre-closure conditions to the completion of Phase 2. The increase in CO emissions is primarily a result of the increase in the vehicle miles traveled by facility employees. The increase in emissions of particulate matter is due solely to C&D projects.

4.5.2.5 Alternative Reuse Scenario 4

The primary air emission sources are expected to be aircraft, mobile source activity to and from the former Cecil Field, construction activities, and the addition of a boiler plant for the proposed correctional facility.

Aircraft emissions are projected to be the same under ARS 4 as in the Preferred Reuse Plan. Vehicle-related emissions are shown in Table 4-22. These emissions are based on emission factors and projected daily trips (see Section 4.8). C&D emissions are shown in Table 4-23. VOC and NO_x emissions result from equipment engine exhaust; particulate emissions are generated by mechanical disturbance of existing structures and soil.

Summaries of projected emissions for ARS 4 and pre-closure emissions are presented in Table 4-24. Annual emissions of VOCs and NO_x would decrease from pre-closure conditions to the completion of Phase 2 by 384 tons and 201 tons, respectively. Annual particulate emissions would increase by 82 tons. CO would increase by 706 tons.

Table 4-19

VEHICLE EMISSION FACTORS, ANNUAL VMT, AND EMISSIONS FOR ARS 3

Development Phase	Vehicle Emission Factors (grams/mile)			Annual VMT	Total Emissions (tons/year)		
	VOCs	NO_x	CO		VOCs	NO_x	CO
Phase 1 (1998-2004)	1.58	2.23	21.05	28,684,787	50	71	666
Phase 2 (2005-2010)	1.58	2.23	21.05	118,687,383	207	292	2,754

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
VMT = Vehicle miles travelled.
VOCs = Volatile organic compounds.

Sources: EPA 1992a; E & E 1996.

Table 4-20

ANNUAL CONSTRUCTION AND DEMOLITION AIR EMISSIONS FOR ARS 3 (tons/year)

Activity	Phase 1				Phase 2			
	Acreage[a]/ Year	VOCs	NO_x	PM	Acreage[a]/ Year	VOCs	NO_x	PM
Demolition[b]	113.8	8.2	549.4	1.8	218.4	15.8	114	2.3
Site Prep[c]	113.8	5.8	47.0	3.7	218.4	11.1	90.2	7.1
Construction[d]	113.8	11.5	90.7	544.0	218.4	22.2	174.1	1,045
Total	NA	25.5	197.1	549.5	NA	49.1	378.3	1,054

a Acreage used in site preparation and construction calculations is total disturbed land (twice construction footprint).

b Demolition structural floor space assumed equal to new construction floor space. Emission calculations based on EPA 1992.

c Site preparation assumed to require 15 days/year.

d Construction assumed to require two small cranes, two hi-lifts, two compactors, one paver, two rollers, and five haul trucks for 120 days each year. Based on ratio of acreages (13.8/2.3 = 6).

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-21

AIR POLLUTANT EMISSIONS SUMMARY FOR ARS 3 (tons/year)

Emission Source	VOCs	NO_x	CO	PM
Pre-closure	711	552	883	25
Phase 1				
Aircraft	—	—	—	—
Stationary	—	—	—	—
Construction	25.5	197.1	—	550
Mobile	50	71	666	—
Total	76	268	666	550
Net change from pre-closure	-635	-284	-217	+525
Phase 2				
Aircraft	—	—	—	—
Stationary	—	—	—	—
Construction	49.1	378.3	—	1,054
Mobile	207	292	2,754	—
Total	256	670	2,754	1,054
Net change from pre-closure	-455	+118	+1,871	+1,029

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-22

VEHICLE EMISSION FACTORS, ANNUAL VMT, AND EMISSIONS FOR ARS 4

Development Phase	Vehicle Emission Factors (grams/mile)			Annual VMT	Total Emissions (tons/year)		
	VOCs	NO_x	CO		VOCs	NO_x	CO
Phase 1 (1998-2004)	1.58	2.23	21.05	30,026,206	54	74	697
Phase 2 (2005-2010)	1.58	2.23	21.05	64,944,791	113	160	1,507

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
VMT = Vehicle miles travelled.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-23

ANNUAL CONSTRUCTION AND DEMOLITION AIR EMISSIONS FOR ARS 4 (tons/year)

Activity	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
	Acreage[a]/yr	VOCs	NO_x	PM	Acreage[a]/yr	VOCs	NO_x	PM
Demolition[b]	23.0	1.7	12	2.9	21.6	1.6	11.3	2.8
Site Prep[c]	23.0	1.2	9.5	0.8	21.6	1.1	8.9	0.7
Construction[d]	23.0	2.3	18.3	110.0	21.6	2.2	17.2	103.3
Total	NA	5.2	39.8	113.7	NA	4.9	37.4	106.8

[a] Acreage used in site preparation and construction calculations is total disturbed land (twice construction footprint).
[b] Demolition structural floor space assumed equal to new construction floor space. Emission calculations based on EPA 1992.
[c] Site preparation assumed to require 15 days/year.
[d] Construction assumed to require two small cranes, two hi-lifts, two compactors, one paver, two rollers, and five haul trucks for 120 days each year. Based on ratio of acreages (13.8/2.3 = 6).

Key:

ARS = Alternative Reuse Scenario.
NA = Not applicable.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

Table 4-24

AIR POLLUTANT EMISSIONS SUMMARY FOR ARS 4 (tons/year)

Emission Source	VOCs	NO_x	CO	PM
Pre-closure	711	552	883	25
Phase 1				
Aircraft	68.4	65.1	—	—
Stationary	85	33	82	—
Construction	5.2	39.8	—	113.7
Mobile	52	74	697	—
Total	210.6	211.9	779	113.7
Net change from pre-closure	-500.4	-340.1	-104	+88.7
Phase 2				
Aircraft	124.3	120.2	—	—
Stationary	85	33	82	—
Construction	4.9	37.4	—	106.8
Mobile	113	160	1,507	—
Total	327.2	350.6	1,589	106.8
Net change from pre-closure	-383.3	-201.4	+706	+81.8

Note: Stationary sources include boiler and other airfield type sources. Emissions estimate based on actual reported emissions for 1994.

Key:

ARS = Alternative Reuse Scenario.
CO = Carbon monoxide.
NO_x = Oxides of nitrogen.
PM = Particulate matter.
VOCs = Volatile organic compounds.

Source: Ecology and Environment, Inc., 1996.

4.5.2.6 Cumulative Impacts

Other than the termination of Navy aircraft operations at NAS Cecil Field after its closure, the only reasonably foreseeable action that could result in cumulative impacts to air quality would be the subsequent use of OLF Whitehouse by NAS Jacksonville (see Section 1.4). OLF Whitehouse will be used for operations by P-3 and S-3 aircraft. S-3 aircraft will be transferred to NAS Jacksonville after NAS Cecil Field is closed. However, emissions associated with these operations should not result in cumulative increases, because they would involve only a redistribution of aircraft operations from one portion of the air quality control region (i.e., Duval County) to another. The actual emission estimates associated with these changes will be the subject of separate NEPA documentation at NAS Jacksonville.

More significantly, the termination of F/A-18 operations at NAS Cecil Field will result in cumulative reductions in ozone precursor emissions in the region. The cumulative impact on VOC and NO_x emissions for the Preferred Reuse Plan compared to pre-closure levels is a decrease in emissions. The projected VOC and NO_x emission decreases demonstrates that the Preferred Reuse Plan would not cause or contribute to any new violation of the ozone NAAQS. The cumulative impact of these emission changes would not have a significant impact on ozone concentration; therefore, implementation of the Preferred Reuse Plan and each of the ARSs would conform to the Florida SIP.

The cumulative impact of the Preferred Reuse Plan on CO emissions is anticipated to be higher at the completion of Phase 2 than at pre-closure. CO emission increases are the result of projected increases in VMT. However, Duval County is in attainment for CO; therefore, this increase would not have significant implications on conformance with the Florida SIP.

PM emissions increase under the Preferred Reuse Plan as a result of C&D activities, but these increases are considered temporary. These emissions would cease upon completion of construction projects.

4.5.2.7 Mitigation

Mitigation measures for CO emissions include improving traffic flow or applying traffic demand measures to reduce VMT and CO emissions. The need for mitigation and selection of specific mitigation measures will be developed by individual developers in conjunction with local agencies following submission of individual project plans.

Mitigation measures for PM emissions occurring during construction/demolition activities include applying water or another wetting agent to prevent dust production during

these activities. Individual developers will be required by local agencies to evaluate the need for mitigation following submission of individual project plans.

4.6 Noise

4.6.1 Preferred Reuse Plan

The most significant sources of noise resulting from implementation of the Preferred Reuse Plan are military and civilian aircraft operations. Other less significant noise sources include traffic, industrial operations, and C&D activities.

Noise impacts resulting from aircraft operations were analyzed using the Integrated Noise Model (INM) Version 5.0 (FAA 1995). INM is an FAA computer-based model that is used to evaluate aircraft noise impacts in the vicinity of civilian airports. INM contains several databases that contain aircraft procedure and noise data. After entering projected aircraft operations (e.g., LTO cycles, T&G operations), runway, flight track, and flight profile data, INM was used to generate projected L_{dn} noise contours surrounding NAS Cecil Field for the subsequent phases of redevelopment after its closure.

Under the Preferred Reuse Plan, five types of civilian fixed wing aircraft and three types of helicopters are anticipated to use the airfield (CFDC 1996).

For civilian aircraft, representative aircraft models within each category were used for the purposes of the modeling (FAA 1995). These aircraft models included the GASE-PV (single-engine prop), Beechcraft Model 58 Barron (twin-engine prop), DASH 7 (turbo prop), Lear 25 (corporate jet), and Boeing 737 (large jet).

It should be noted that projected helicopter operations were not included in the noise analysis. FAA does not include model inputs for noise analysis of helicopter operations in the INM; the Heliport Noise Model (HNM) was used to evaluate these impacts (FAA 1995).

In accordance with guidance from the FAA (Vahovich 1997), HNM model runs for helicopter operations associated with reuse of NAS Cecil Field were inputed into INM to obtain the total projected noise exposure associated with projected rotary- and fixed-wing aircraft operations. The UH-60 helicopter was used as the surrogate rotary-wing aircraft. This helicopter type has a rotor type (i.e., double rotor), power plant, and horsepower comparable to the AH-64 helicopter. It is slightly larger and more powerful than the OH-58. Therefore, use of the noise profile of the UH-60 would result in a conservative estimate of helicopter noise.

Assumed flight tracks and profiles for the model were derived from the NAS Cecil Field AICUZ program, which currently governs existing operations at the station (see Figures

4-6 and 4-7). It is reasonable to assume that these tracks would remain relatively similar under civilian use of the station after closure. Full LTO cycles and T&G operations were distributed over each of the station's primary and crosswind runways using the same percentages indicated in the AICUZ documentation, which was calculated based upon historic wind direction data (U.S. Navy 1984). This distribution is presented in Table 4-25.

Projected L_{dn} contours for Phase 1 (2004) of the redevelopment under the Preferred Reuse Plan are compared to existing AICUZ noise contours and depicted on Figure 4-8; Figure 4-9 presents the same comparison for Phase 2 (2010) of the redevelopment. As these figures show, projected noise exposure from aircraft operations at the station would be significantly less than under pre-closure conditions. This is primarily the result of the significant decrease in overall operations that will occur after the station closes and because aircraft training activities between NAS Cecil Field and OLF Whitehouse will no longer occur.

Figure 4-10 presents projected Phase 2 noise contours over existing surrounding land use. As shown, the 75 dB contour stays with the current station boundary and would not significantly affect on-station land uses proposed under the Preferred Reuse Plan, as compared to existing AICUZ noise contours. The projected 65 dB contour would extend beyond the current station boundaries; however, it would primarily affect lands devoted to forestry and conservation. No significant residential populations would be affected by projected noise contours under the Preferred Reuse Plan.

In addition to noise associated with aircraft operations as implementation of the Preferred Reuse Plan progresses, it is anticipated that business establishments would begin to relocate to the station, resulting in long-term, gradual increases in ambient noise levels from other sources. These increases would be associated with both industrial operations and local traffic resulting from increased employment. In addition, future infrastructure and road improvements, as well as the demolition of station structures during redevelopment, would require the use of heavy construction machinery, resulting in short-term increases in ambient sound levels. Quantitative estimates of the noise levels resulting from these sources cannot be conducted without specific data regarding the new industrial activities, projected traffic, and construction/demolition projects. Nevertheless, the absence of any concentrations of sensitive noise receptors (e.g., residential areas, hospitals, churches, etc.) in proximity to the station indicates that these effects would not be significant.

Table 4-25

AVERAGE DAILY RUNWAY DISTRIBUTION OF PROJECTED FLIGHT OPERATIONS

Runway Usage[b]	INM51 Representative Aircraft	LTOs/Year —	T&Gs/Year —	LTOs/day[a] —	T&Gs/day[a] —	Runway 18L		Runway 18R		Runway 36L		Runway 36R	
						Full LTOs 17.70%	T&Gs 12.80%	Full LTOs 17.90%	T&Gs 12.30%	Full LTOs 18.20%	T&Gs 20%	Full LTOs 15.50%	T&Gs 19.90%
Phase 1													
AH-64	UH-60[c]	1,450	475	6.04	2.0	1.07	0.26	1.08	0.25	1.10	0.40	.94	0.39
UH-60	UH-60[c]	425	175	1.77	0.73	0.31	0.09	0.32	0.08	0.33	0.15	0.27	0.14
OH-58	UH-60[c]	1,325	325	5.52	1.35	0.98	0.17	0.99	0.16	1.00	0.27	0.86	0.26
Single Engine Piston	GASEPV	10,000	2,000	41.67	8.33	7.38	1.07	7.46	1.03	7.58	1.67	6.46	1.66
Twin Engine Piston	BEC58P	10,000	2,000	41.67	8.33	7.38	1.07	7.46	1.03	7.58	1.67	6.46	1.66
Turbo Prop	DHC7	15,000	2,000	62.50	8.33	11.06	1.07	11.19	1.03	11.38	1.67	9.69	1.66
Corporate Jet	LEAR25	15,000	0	62.50	0	11.06	0	11.19	0	11.38	0	9.69	0
Large Jet	Boeing 737	5,000	0	20.83	0	3.69	0	3.73	0	3.79	0	3.23	0
Phase 2													
AH-64	UH-60	3,300	1,200	13.75	5.0	2.43	0.64	2.46	0.62	2.50	1.00	2.13	0.99
UH-60	UH-60	875	300	3.65	1.25	0.64	0.16	0.65	0.15	0.66	0.25	0.57	0.24
OH-58	UH-60	875	250	3.65	1.04	0.64	0.13	0.65	0.12	0.66	0.21	0.57	0.20
Single Engine Piston	GASEPV	15,000	2,500	62.50	10.42	11.06	1.33	11.19	1.28	11.38	2.08	9.69	2.07
Twin Engine Piston	BEC58P	20,000	2,500	83.33	10.42	14.75	1.33	14.92	1.28	15.17	2.08	12.92	2.07
Turbo Prop	DHC7	25,000	2,500	104.17	10.42	18.44	1.33	18.65	1.28	18.96	2.08	16.15	2.07
Corporate Jet	LEAR25	20,000	0	83.33	0	14.75	0	14.92	0	15.17	0	12.92	0
Large Jet	Boeing 737	10,000	0	41.67	0	7.38	0	7.46	0	7.58	0	6.46	0

Key at end of table.

Table 4-25

AVERAGE DAILY RUNWAY DISTRIBUTION OF PROJECTED FLIGHT OPERATIONS

Runway Usage[b]	INM51 Representative Aircraft	LTOs/Year	T&Gs/Year	LTOs/day[a]	T&Gs/day[a]	Runway 9L		Runway 9R		Runway 27L		Runway 27R	
						Full LTOs	T&Gs	Full LTOs	T&Gs	Full LTOs	T&Gs	Full LTOs	T&Gs
						7.70%	10%	7.70%	9.80%	7.70%	9.70%	7.70%	6.50%
Phase 1													
AH-64	UH-60	1,450	475	6.04	2.0	0.47	0.20	0.47	0.19	0.47	0.19	0.47	0.13
UH-60	UH-60	425	175	1.77	0.73	0.14	0.07	0.14	0.06	0.14	0.06	0.14	0.05
OH-58	UH-60	1,325	325	5.52	1.35	0.43	0.13	0.43	0.12	0.43	0.12	0.43	0.09
Single Engine Piston	GASEPV	10,000	2,000	41.67	8.33	3.21	0.83	3.21	0.82	3.21	0.81	3.21	0.54
Twin Engine Piston	BEC58P	10,000	2,000	41.67	8.33	3.21	0.83	3.21	0.82	3.21	0.81	3.21	0.54
Turbo Prop	DHC7	15,000	2,000	62.50	8.33	4.81	0.83	4.81	0.82	4.81	0.81	4.81	0.54
Corporate Jet	LEAR25	15,000	0	62.50	0	4.81	0	4.81	0	4.81	0	4.81	0
Large Jet	Boeing 737	5,000	0	20.83	0	1.60	0	1.60	0	1.60	0	1.60	0
Phase 2													
AH-64	UH-60	3,300	1,200	13.75	5.0	1.06	0.50	1.06	0.49	1.06	0.48	1.06	0.33
UH-60	UH-60	875	300	3.65	1.25	0.28	0.13	0.28	0.12	0.28	0.12	0.28	0.08
OH-58	UH-60	875	250	3.65	1.04	0.28	0.10	0.28	0.10	0.28	0.10	0.28	0.07
Single Engine Piston	GASEPV	15,000	2,500	62.50	10.42	4.81	1.04	4.81	1.02	4.81	1.01	4.81	0.68
Twin Engine Piston	BEC58P	20,000	2,500	83.33	10.42	6.42	1.04	6.42	1.02	6.42	1.01	6.42	0.68
Turbo Prop	DHC7	25,000	2,500	104.17	10.42	8.02	1.04	8.02	1.02	8.02	1.01	8.02	0.68
Corporate Jet	LEAR25	20,000	0	83.33	0	6.42	0	6.42	0	6.42	0	6.42	0
Large Jet	Boeing 737	10,000	0	41.67	0	3.21	0	3.21	0	3.21	0	3.21	0

Key at end of table.

Table 4-25 (Cont.)

[a] Assumes 240 flying days per year. 75% of daily flights during day (0700-1900) and 25% during evening (1900-2200).
[b] Runway usage (i.e., primary vs. crosswind) assumed to be the same as reported in the NAS Cecil Field AICUZ documentation.

Key:

AICUZ = Air Installation Compatible Use Zone.
Full LTOs = Aircraft operations that include takeoff, climbout, approach, landing, and taxiing modes.
INM51 = Integrated Noise Model (Version 5.1).
T&Gs = Touch-and-go aircraft operations.

Source: CFDC 1996; U.S. Navy 1984.

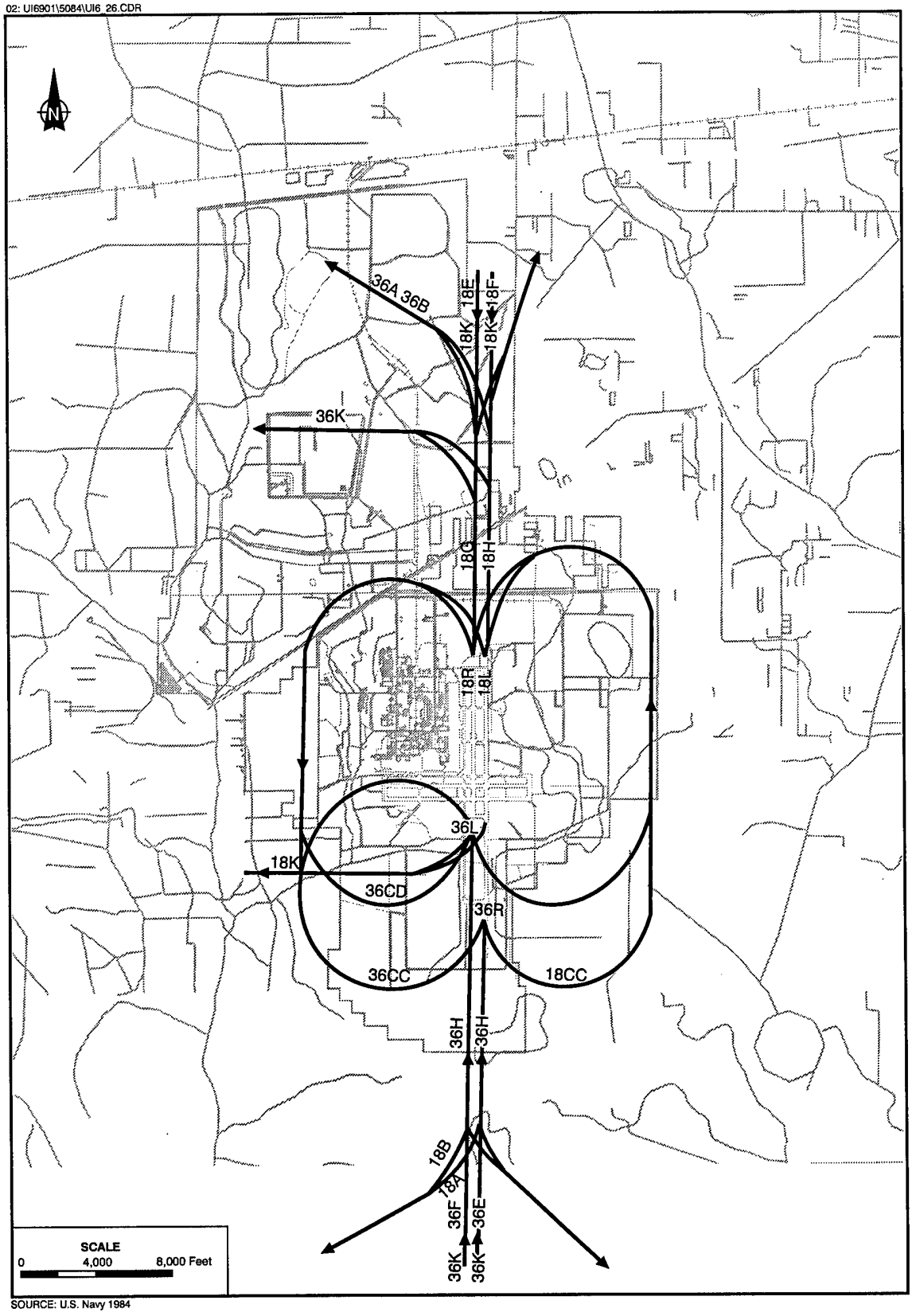
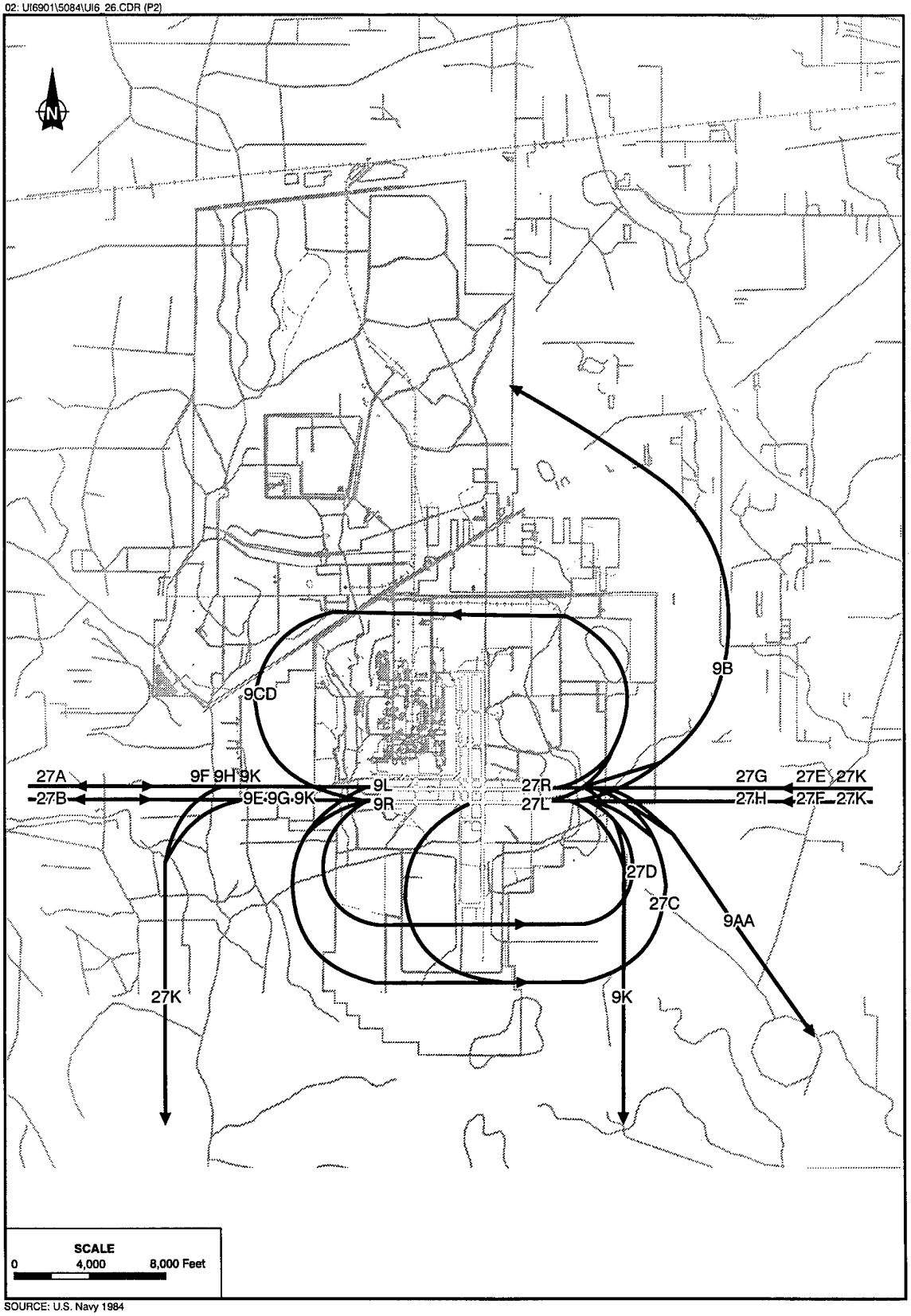


Figure 4-6 FLIGHT TRACKS ASSOCIATED WITH RUNWAYS 18 AND 36

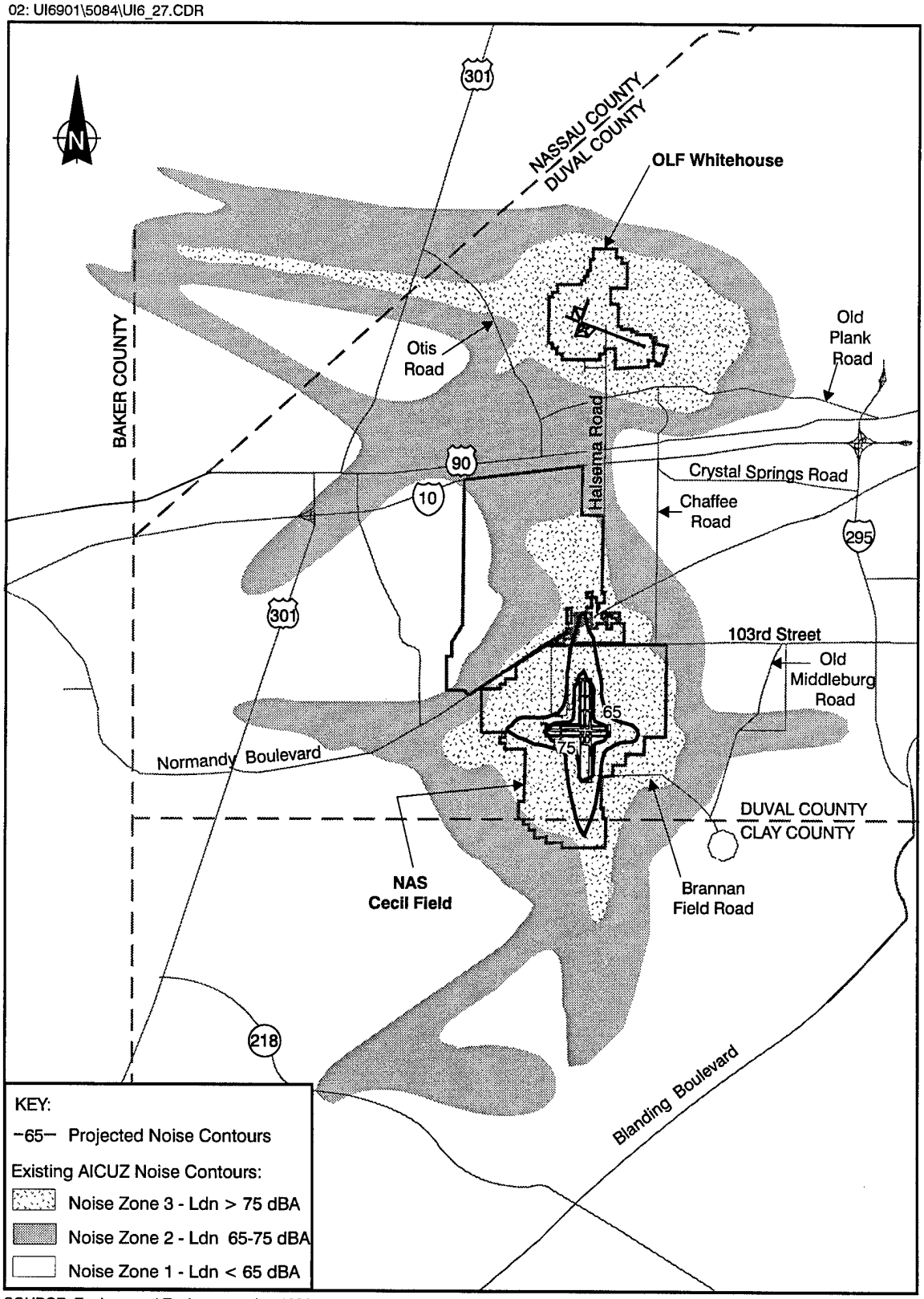
02: U(6901\5084\UI6_26.CDR (P2)



SOURCE: U.S. Navy 1984

Figure 4-7 FLIGHT TRACKS ASSOCIATED WITH RUNWAYS 9 AND 27

02: UI6901\5084\UI6_27.CDR

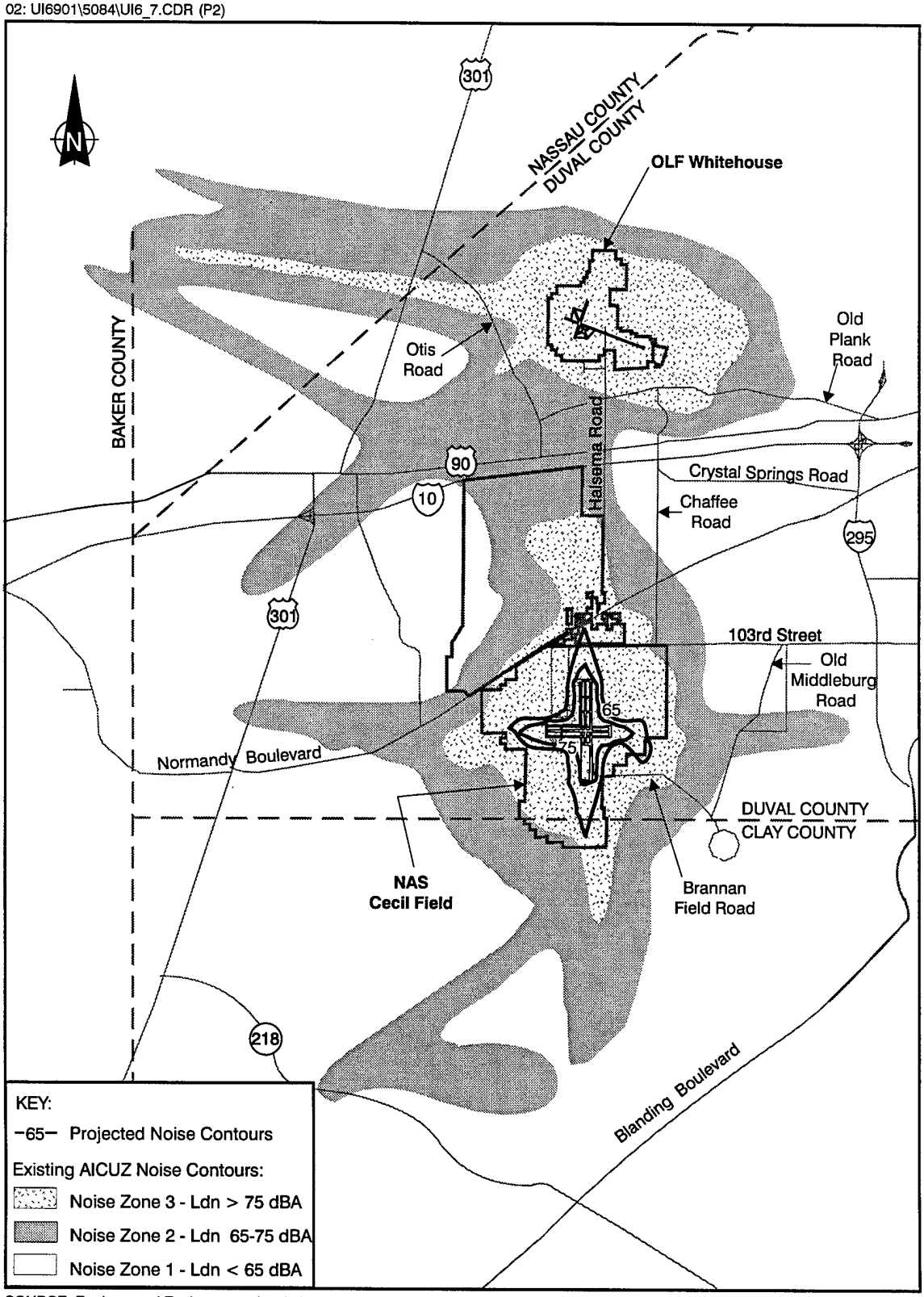


SOURCE: Ecology and Environment, Inc.1996

SCALE
0 18,500 37,000 Feet

Figure 4-8 PROJECTED PHASE 1 (2004) NOISE CONTOURS AND EXISTING AICUZ NOISE CONTOURS

02: UI6901\5084\UI6_7.CDR (P2)

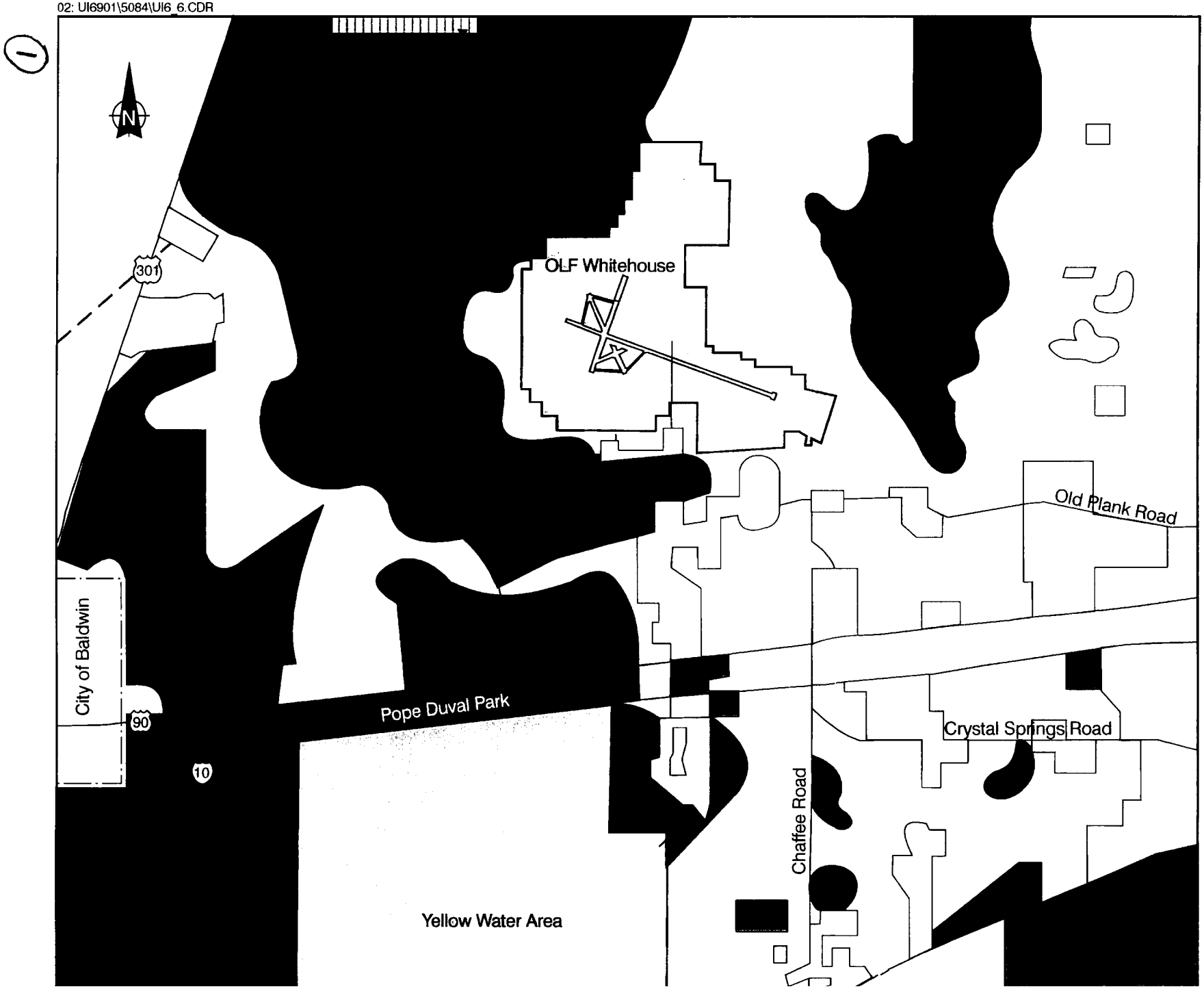


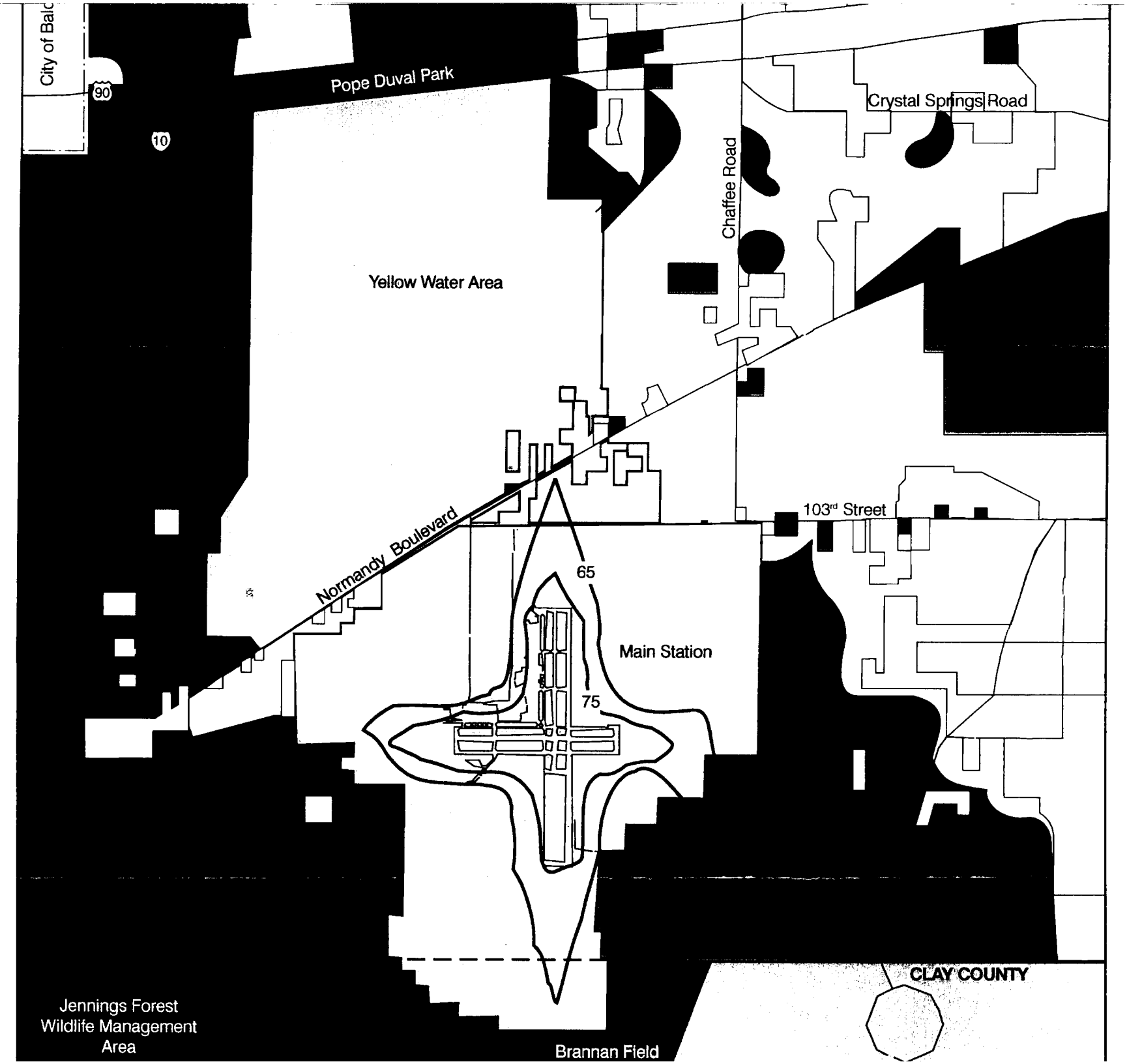
SOURCE: Ecology and Environment, Inc.1996

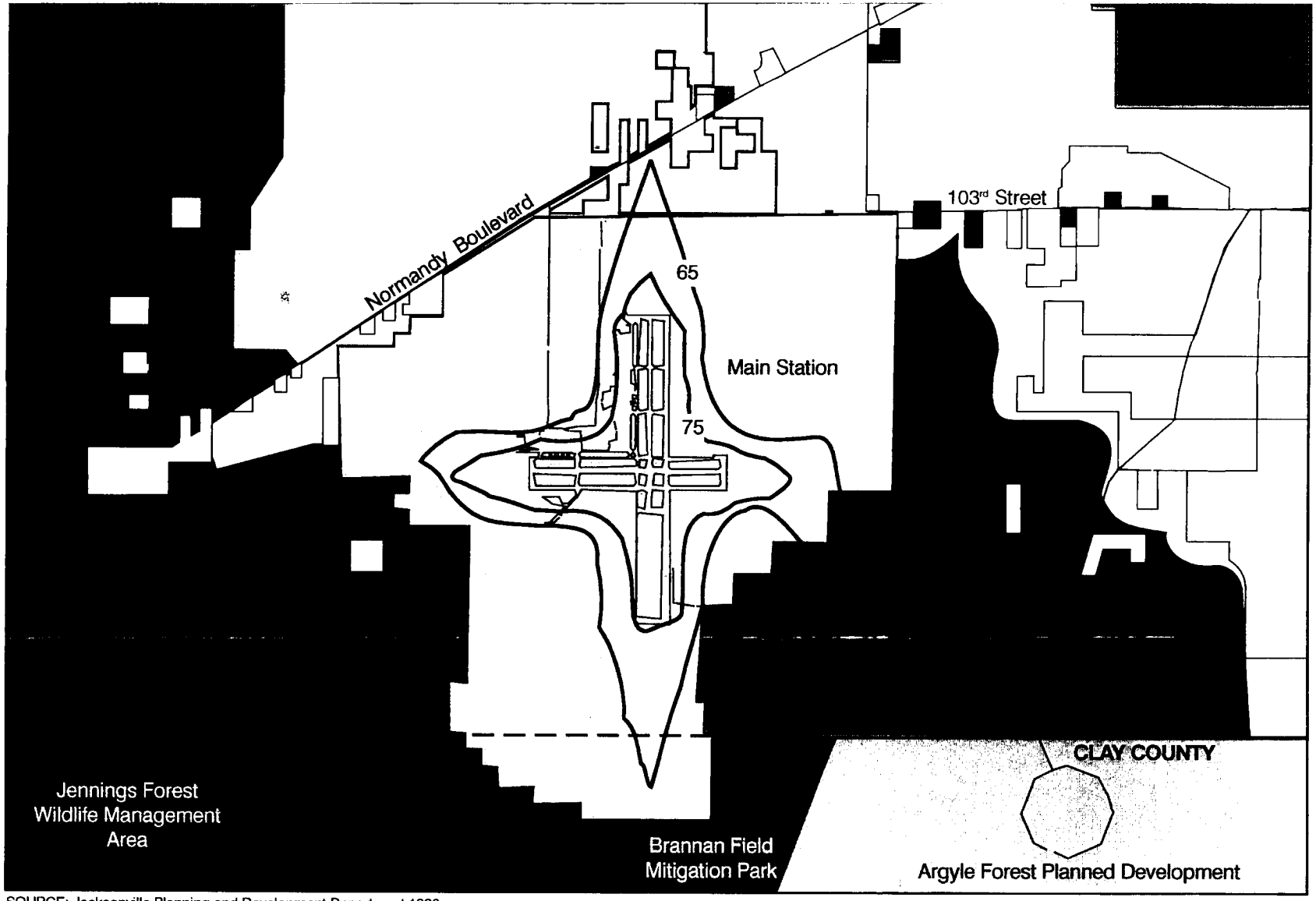
SCALE
0 18,500 37,000 Feet

Figure 4-9 PROJECTED PHASE 2 (2010) NOISE CONTOURS AND EXISTING AICUZ NOISE CONTOURS

02: UI6901\5084\UI6_6.CDR




City of Bald
90
10
Pope Duval Park
Crystal Springs Road
Chaffee Road
Yellow Water Area
103rd Street
Normandy Boulevard
65
75
Main Station
CLAY COUNTY
Jennings Forest
Wildlife Management
Area
Brannan Field



SOURCE: Jacksonville Planning and Development Department 1990

KEY:

- Agriculture
- Low-Density Residential
- Navy Property
- Recreation
- Commercial
- Airport
- Planned Community (Not yet constructed)
- State Forest
- Open Space/Vacant
- Proposed Northeast Florida Regional Wildlife Mitigation Park

SCALE

0 3,500 7,000 14,000 Feet

Figure 4-10 PROJECTED PHASE 2 (2010) NOISE CONTOURS AND SURROUNDING LAND USE

4.6.2 Alternative Reuse Scenario 1

Under ARS 1, ambient noise levels in the vicinity of NAS Cecil Field would decrease from pre-closure conditions because of the cessation of fixed-wing aircraft operations. Other noise sources would also be significantly limited as the majority of the station would be reused for forestry and recreation.

Noise from aircraft sources would be limited to that associated with helicopter operations. HNM was used to project noise contours associated with projected helicopter operations under ARS 1. Figures 4-11 and 4-12 present projected noise contours for Phase 1 and Phase 2 levels of operation under ARS 1. As shown, projected noise contours are significantly smaller than pre-closure contours and noise contours associated with the Preferred Reuse Plan. The projected contours would extend over only a small area outside assumed helicopter parking areas.

The limited market-driven development and recreational facilities planned for the remainder of the site under ARS 1 are not expected to generate significant levels of ambient noise.

4.6.3 Alternative Reuse Scenario 2

Noise impacts under ARS 2 would be similar to the Preferred Reuse Plan for aircraft sources and less significant for other noise sources.

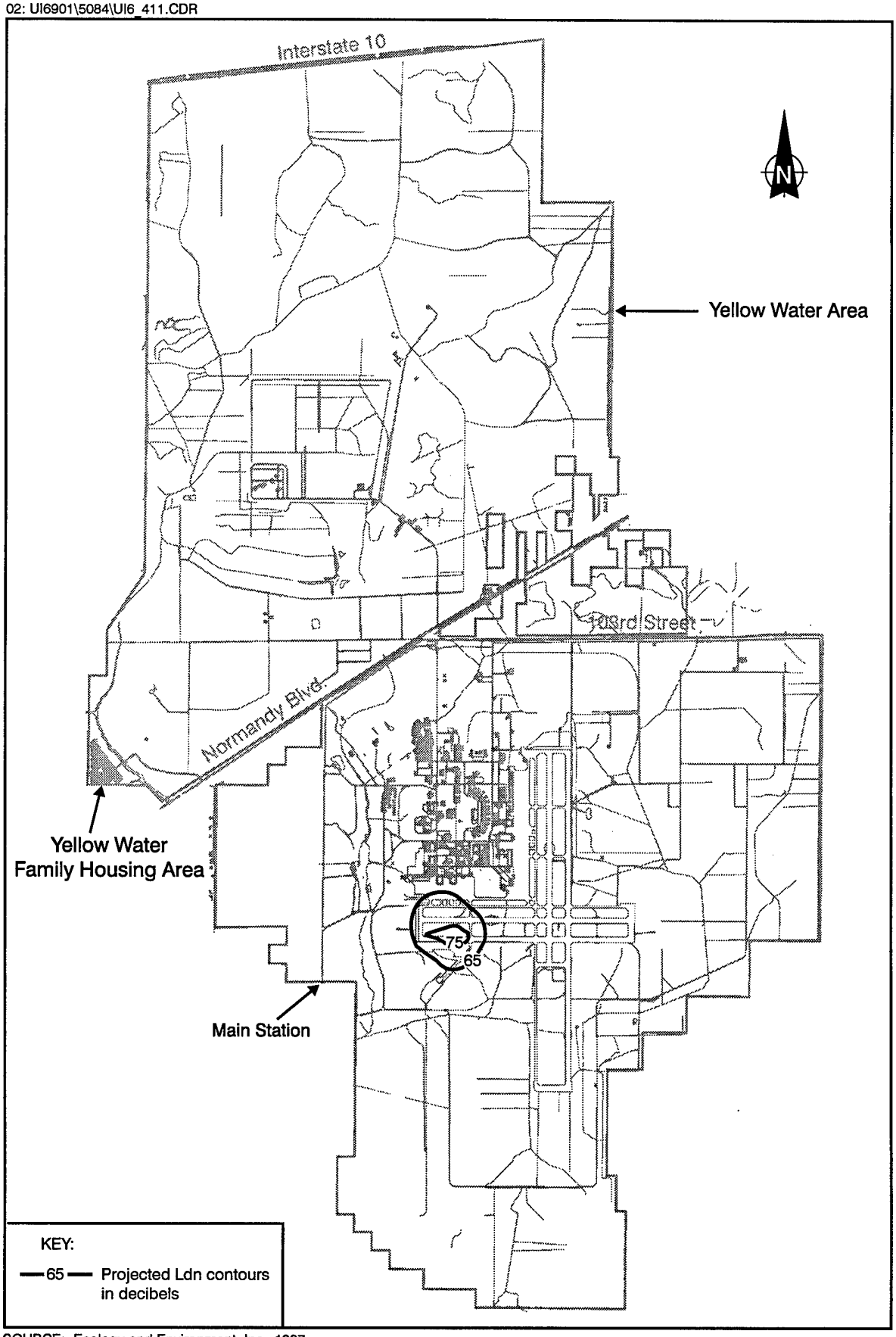
Noise impacts resulting from aircraft operations would be similar to the Preferred Reuse Plan because the projected level of aircraft operations would be the same. Long-term noise levels resulting from other sources under ARS 3 would be slightly less than under the Preferred Reuse Plan because the alternative involves low levels of infrastructure and industrial development at the site.

4.6.4 Alternative Reuse Scenario 3

ARS 3 would result in the greatest decrease in ambient noise levels from pre-closure levels because all aircraft operations at NAS Cecil Field would cease after closure.

Construction of residential, commercial, and industrial areas would result in short-term and minor increases in noise levels above background levels. Local traffic noise would also increase. However, long-term development under ARS 3 would present a greater potential of creating future noise conflicts with sensitive receptors by locating a large residential development in proximity to light industrial and manufacturing uses.

02: UI6901\5084\UI6_411.CDR

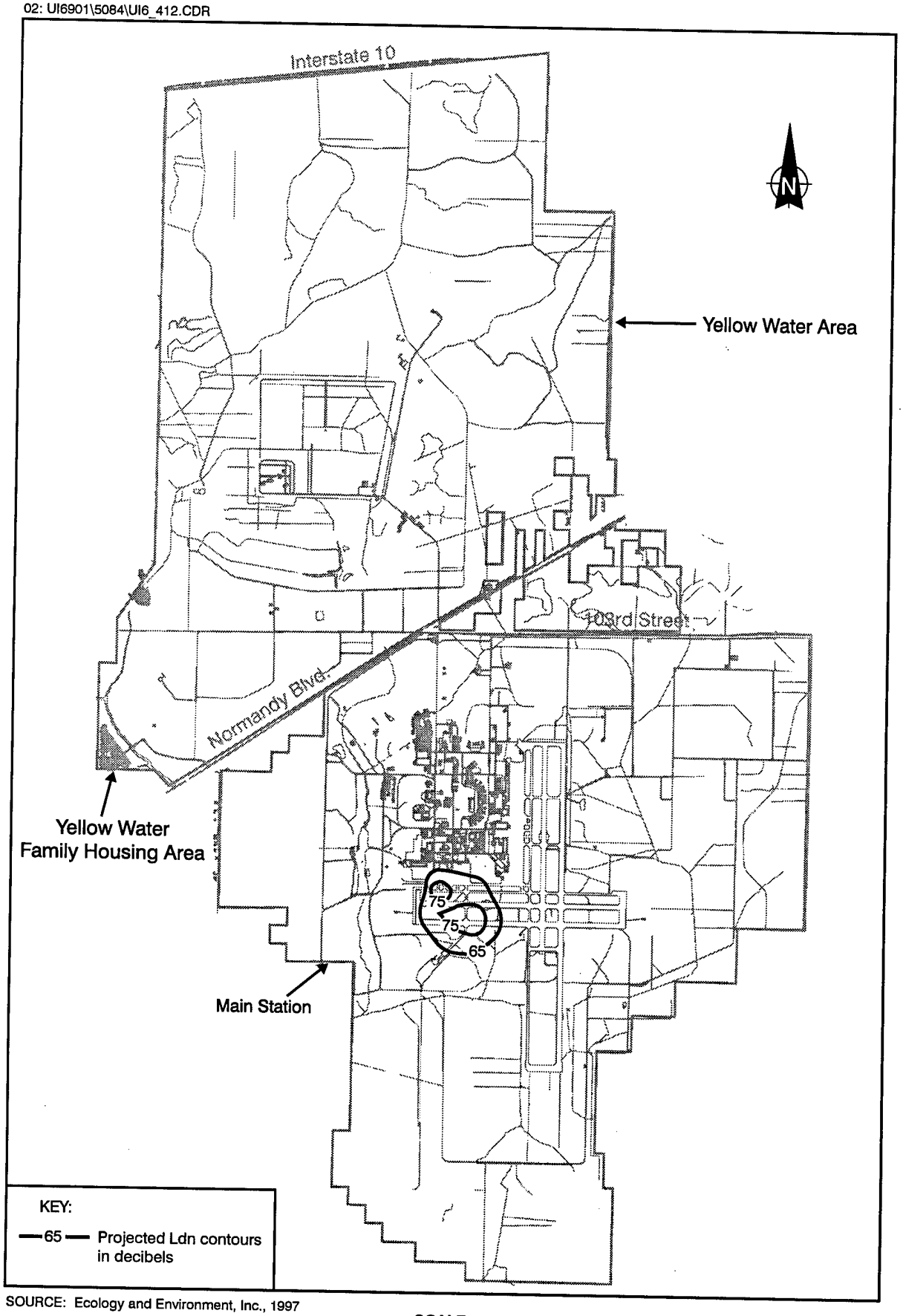


SOURCE: Ecology and Environment, Inc., 1997

SCALE
0 ½ 1 Mile

Figure 4-11 PHASE 1 PROJECTED NOISE CONTOURS - ARS 1

02: UI6901\5084\UI6_412.CDR



SOURCE: Ecology and Environment, Inc., 1997

SCALE
0 ½ 1 Mile

Figure 4-12 PHASE 2 PROJECTED NOISE CONTOURS - ARS 1

4.6.5 Alternative Reuse Scenario 4

Noise impacts under ARS 4 would be similar to the Preferred Reuse Plan because the development patterns and aircraft operations are the same, with the exception of planned correctional and juvenile justice facilities under this alternative. Neither of these facilities would be a significant noise source.

4.6.6 Cumulative Impacts

Other than the cessation of Navy aircraft operations at NAS Cecil Field associated with its closure, the only reasonably foreseeable actions that could potentially result in cumulative impacts to noise exposure levels would be the planned use of OLF Whitehouse by Navy aircraft at NAS Jacksonville.

Cumulatively, the closure of NAS Cecil Field and reuse of the station would result in an overall decrease in aircraft noise levels in the vicinity of the station property. This is the result of an overall decrease in the total number of operations occurring in the vicinity of the station following its closure. In addition, the types of aircraft that would conduct operations at the airfield after closure would have engine types that emit lower noise levels than turbo fan and turbo jet engines used by Navy aircraft currently based at the station.

The use of OLF Whitehouse by Navy aircraft at NAS Jacksonville should not result in cumulative noise impacts in the vicinity of NAS Cecil Field. As presented in Section 4.6.1, noise exposure contours associated with the Preferred Reuse Plan would extend only slightly beyond the property boundaries at the station and would be significantly smaller than pre-closure contours. Because Navy aircraft from NAS Jacksonville would not conduct low level operations over the Cecil Field property, it is unlikely that use of OLF Whitehouse (located 7 miles north of the station) would result in noise exposure contours that overlap with those associated with the Preferred Reuse Plan. Therefore, there would be no cumulative effects resulting from these actions.

The specific implications of the use of OLF Whitehouse, if any, are not yet known; the Navy is currently conducting separate NEPA documentation for this action.

4.6.7 Mitigation Measures

As discussed in Section 3.6, the Navy currently mitigates aircraft noise impacts through its AICUZ program, which is a comprehensive approach designed to avoid airfield encroachment by incompatible land uses. This is accomplished through the designation of various noise exposure and accident potential zones, which are based upon current airfield

operations. The City of Jacksonville has adopted these zone designations as part of their local comprehensive plan and development regulations. Although military aircraft operations would cease after closure and projected aircraft operations associated with the Preferred Reuse Plan are expected to be lower than pre-closure levels, the city intends to continue its approach to land use control around the station property to avoid future encroachment by incompatible uses.

Short-term noise impacts resulting from C&D activities would be mitigated by the developers of projects that would occur during the redevelopment process. These activities would be administered by the City through its development review and permitting processes. Measures designed to mitigate these types of impacts would include the use of appropriate noise reduction equipment, such as mufflers and baffles on construction machinery, and/or regulation of the time periods during which construction activities occur, such as restricting construction to daylight hours when noise impacts are less obtrusive.

4.7 Socioeconomics and Community Services

4.7.1 Preferred Reuse Plan

Population

The Preferred Reuse Plan is projected to have only a minor impact on the population and demographics of Duval and Clay counties and on the Jacksonville MSA as a whole. As shown in Table 4-26, a total of approximately 3,199 direct jobs and 3,528 indirect jobs are expected to be created by the implementation of this plan (The Arthur Andersen Group et al. n.d.). Creation of these jobs would spur economic activity in the region and potentially create an incentive for people to relocate to the area.

However, given the size of the regional economy and the previous loss of approximately 7,435 direct full-time military and civilian jobs due to the closure of NAS Cecil Field, the Preferred Reuse Plan's effect on the regional population is not expected to be significant. In addition, a large portion of the jobs created under this plan are predicted to be filled by unemployed or underemployed residents currently living in the Jacksonville area, thus decreasing the incentive for new residents to relocate to the area.

Economy, Employment, and Income

With the exception of ARS 4, the Preferred Reuse Plan would have the greatest positive economic impact on the City of Jacksonville and its surrounding communities.

Table 4-26

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF THE PREFERRED REUSE PLAN

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Phase 1: 1998-2004			
Business Park Users	333	320	653
Commercial	0	0	0
Air Cargo	20	19	39
Aircraft Manufacturing/Repair	200	298	498
Manufacturing	250	305	555
Warehouse/Distribution	400	384	784
Total	1,203	1,326	2,529
Phase 2: 2005-2010			
Business Park Users	333	319	652
Commercial	133	72	205
Air Cargo	30	29	59
Aircraft Manufacturing/Repair	400	596	996
Manufacturing	500	610	1,110
Warehouse/Distribution	600	576	1,176
Total	1,996	2,202	4,198
Total: Phase 1 and 2			
Business Park Users	666	639	1,305
Commercial	133	72	205
Air Cargo	50	48	98
Aircraft Manufacturing/Repair	600	894	1,494
Manufacturing	750	915	1,665
Warehouse/Distribution	1,000	960	1,960
Total	3,199	3,528	6,727

Source: The Arthur Andersen Group et al. n.d.

Implementation of the Preferred Reuse Plan is projected to create 3,199 direct jobs in the region. Under this plan, warehouse and distribution firms are projected to become the largest employers at the former military facility by employing approximately 1,000 persons. Other large employers at the site are expected to be manufacturing industries, business park users, and aircraft manufacturing and repair companies (see Table 4-26).

The initial job creation activity would induce additional economic growth in the regional economy. As these industries move to the former NAS Cecil Field they would likely hire employees from the Jacksonville area. As these new employees spend a portion of their additional disposable income in the regional economy and/or as these new industries purchase goods and services from the local suppliers, the income of other local businesses would expand. In response, these local businesses may hire more employees or expand their total output; thus, "multiplying" the positive economic effects of this initial injection of funds into the economy.

Additionally, it is anticipated that this plan would generate approximately $78 million in direct payroll and $67 million in indirect earnings (see Table 4-27). The aircraft manufacturing/repair companies are expected to provide the highest paying jobs at the former NAS Cecil Field with average annual salaries of $35,000 while the commercial industries located at the site are expected to provide the lowest paying jobs with average annual salaries of $10,500 (The Arthur Andersen Group et al. n.d.).

Taxes and Revenues

Implementation of the Preferred Reuse Plan is predicted to generate an estimated $2,164,758 annually in property tax revenues with the total assessed value of taxable property on the former Naval station reaching nearly $100 million (The Arthur Andersen Group et al. n.d.).

To implement the Preferred Reuse Plan, it is expected that $1.8 million to $4.1 million will be spent annually on operation and maintenance costs, and approximately $71.2 million on one-time capital costs. In addition, this plan would require more than $173 million to be spent on capital improvements by other government and private entities (The Arthur Andersen Group et al. n.d.).

Housing

The Preferred Reuse Plan is expected to have only a minor impact on the housing market in the City of Jacksonville and its surrounding communities. The proposed reuse of NAS Cecil Field is not expected to increase the total employment and total population in the

Table 4-27

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF THE PREFERRED REUSE PLAN

Industry/Employer	Direct Payroll	Indirect Earnings	Total Direct and Indirect Earnings
Phase 1: 1998-2004			
Business Park Users	9,990,000	6,693,300	16,683,300
Commercial	0	0	0
Air Cargo	600,000	534,000	1,134,000
Aircraft Manufacturing/Repair	7,000,000	6,090,000	13,090,000
Manufacturing	6,250,000	6,687,500	12,937,500
Warehouse/Distribution	6,000,000	5,340,000	11,340,000
Total	$29,840,000	$25,344,800	$55,184,800
Phase 2: 2005-2010			
Business Park Users	9,990,000	6,693,300	16,683,300
Commercial	1,396,500	991,515	2,388,015
Air Cargo	900,000	801,000	1,701,000
Aircraft Manufacturing/Repair	14,000,000	12,180,000	26,180,000
Manufacturing	12,500,000	13,375,000	25,875,000
Warehouse/Distribution	9,000,000	8,010,000	17,010,000
Total	$47,786,500	$42,050,815	$89,837,315
Total: Phase 1 and 2			
Business Park Users	19,980,000	13,386,600	33,366,600
Commercial	1,396,500	991,515	2,388,015
Air Cargo	1,500,000	1,335,000	2,835,000
Aircraft Manufacturing/Repair	21,000,000	18,270,000	39,270,000
Manufacturing	18,750,000	20,062,500	38,812,500
Warehouse/Distribution	15,000,000	13,350,000	28,350,000
Total	$77,626,500	$67,395,615	$145,022,115

Source: The Arthur Andersen Group et al. n.d.

region over current conditions. Therefore, implementation of the Preferred Reuse Plan would have no impact on the housing market in the City of Jacksonville or its surrounding communities compared to existing conditions.

Education

Implementation of the Preferred Reuse Plan is expected to have only a minor impact on the provision of educational services in Clay and Duval counties. As described in previous sections, the increased economic activity that would occur as a result of the reuse of NAS Cecil Field would stimulate the regional economy and would create an incentive for some new residents to move into the area. It is likely that some relocating persons would have families; therefore, the total number of school-aged children could be affected. However, when the loss of 7,435 direct full-time military and civilian jobs due to the closure of NAS Cecil Field are considered, the total population in the region is not expected to increase over current levels. Because the creation of 3,199 direct jobs under the Preferred Reuse Plan would not be large enough to counteract the negative economic impacts associated with the loss of 7,435 military and civilian jobs, the Preferred Reuse Plan is not anticipated to increase the total population or the total number of school-aged children in the region over existing levels.

When the impacts of both closure and reuse are considered, the Preferred Reuse Plan may have a slight positive impact on the school systems in Duval County. As described previously, the total number of school-aged children is expected to decline as a net result of closure and reuse. At the same time, property tax revenues in Duval County are expected to increase as the land previously owned by the Navy will become taxable.

Emergency and Medical Services

The Preferred Reuse Plan is anticipated to have minor adverse impacts on provision of fire, police, and ambulance services in the City of Jacksonville. The transfer of NAS Cecil Field from Navy ownership to private or local government ownership would increase the area that will need to be serviced by local police, fire, and ambulance corps, and increase their manpower and equipment needs. The negative effects caused by the increase in the area served by local emergency services would be slightly offset by the transfer of all Naval public safety buildings and equipment (e.g., firehouses, police stations, vehicles) to the City of Jacksonville (CFDC 1996). In addition, implementation of the Preferred Reuse Plan would expand local government revenues through an increase in property tax collections. The additional property tax revenues in conjunction with the transfer of buildings and equipment should more than offset any financial burdens placed on the providers of emergency services.

The Preferred Reuse Plan is not expected to have a significant impact on the provision of medical services in the City of Jacksonville or its surrounding communities. Because the regional population is not expected to increase over existing levels, demand for medical services is expected to remain at its current level. Because no change in the supply of medical services is anticipated as a result of the Preferred Reuse Plan, no change in the provision of medical services in the Jacksonville area is projected.

Recreation Services

Implementation of the Preferred Reuse Plan would positively impact the provision of recreational facilities in the Jacksonville area. Under this alternative, most of NAS Cecil Field's existing golf course, athletic fields, and other recreational facilities would continue to be used for these purposes and open to the public, thereby increasing the recreational facilities available to local residents.

4.7.2 Alternative Reuse Scenario 1

Similar to the Preferred Reuse Plan, ARS 1 is anticipated to have very little impact on the population or demographic characteristics of Duval and Clay counties or the Jacksonville MSA as a whole. Based on the limited economic activity that is projected to occur as a result of the implementation of this alternative (see Table 4-28), ARS 1 is not expected to attract a significant number of new residents to the region. Under ARS 1, demographic and population characteristics in the region are expected to remain relatively constant compared to the region's demographic and population characteristics following the closure of NAS Cecil Field.

Economy, Employment and Income

Under ARS 1, ownership of NAS Cecil Field would be retained by public benefit entities, and a small area of land would be used for market-driven development, likely including business park uses. A large portion of the land at the station would be used as a managed forestry preserve.

Approximately 666 direct and 640 indirect jobs are expected to be created by the business park users under this alternative (see Table 4-28). Total direct payroll generated by the reuse of the site is expected to reach nearly $20 million, which will create and additional $13 million in indirect earnings in the regional economy (see Table 4-29).

Table 4-28

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF ARS 1

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Phase 1: 1998-2004			
Business Park Users	333	320	653
Forestry/Recreation	0	0	0
Total	333	320	653
Phase 2: 2005-2010			
Business Park Users	333	320	653
Forestry/Recreation	0	0	0
Total	333	320	653
Total: Phase 1 and 2			
Business Park Users	666	640	1,306
Forestry/Recreation	0	0	0
Total	666	640	1,306

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

Table 4-29

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF ARS 1

Industry/Employer	Direct Payroll	Indirect Income	Total Direct and Indirect Earnings
Phase 1: 1998-2004			
Business Park Users	9,990,000	6,693,300	16,683,300
Forestry/Recreation	0	0	0
Total	$9,990,000	$6,693,300	$16,683,300
Phase 2: 2005-2010			
Business Park Users	9,990,000	6,693,300	16,683,300
Forestry/Recreation	0	0	0
Total	$9,990,000	$6,693,300	$16,683,300
Total: Phase 1 and 2			
Business Park Users	19,980,000	13,386,600	33,366,600
Forestry/Recreation	0	0	0
Total	$19,980,000	$13,386,600	$33,366,600

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

Taxes and Revenues

Annual property tax receipts from the former NAS Cecil Field are projected to reach $520,292, and the total assessed value of taxable property at the site is expected to reach $24 million under this alternative (The Arthur Andersen Group et al. n.d.).

The total capital costs expected to be incurred for redevelopment of the former NAS Cecil Field is estimated to be approximately $13.1 million, and the annual operating and maintenance costs are expected to range between $1.8 million and $4.1 million under ARS 1 (The Arthur Andersen Group et al. n.d.).

Housing

ARS 1 is not anticipated to have a significant impact on the regional housing market in the Jacksonville MSA. Because this alternative would create only a small number of jobs and would not induce any changes in the size of the regional population, the demand for housing would not be affected.

Education

Impacts associated with the implementation of ARS 1 would be similar to those caused by the Preferred Reuse Plan, although the change in population and the increase in property tax revenues would be lower under this alternative than under the Preferred Reuse Plan.

Emergency and Medical Services

The impacts associated with ARS 1 would be similar to those described for the Preferred Reuse Plan.

Recreation

Of all of the alternatives considered, ARS 1 would have the most positive impact on the provision of recreational facilities. Under ARS 1, the majority of the land at the former station would be utilized for forestry and passive recreation purposes. In addition, the existing on-base golf course, athletic fields, and other recreational facilities would be preserved. This alternative would increase the amount of active and passive recreational land available in Jacksonville.

4.7.3 Alternative Reuse Scenario 2

Population

ARS 2 is projected to have only a minor impact on the demographic and population characteristics of Duval and Clay counties and on the Jacksonville MSA as a whole. A total of 1,266 direct jobs and 1,534 indirect jobs are expected to be created by implementing this alternative (The Arthur Andersen Group et al. n.d.). The additional employment opportunities that would be created by this alternative would stimulate the local economy and, to a lesser extent, attract new residents to the region. However, this population impact is expected to be minor when the number of lost jobs and the expected decline in population caused by closure of NAS Cecil Field are considered.

Economy, Employment, and Income

ARS 2 would have a positive impact on the economy of Jacksonville and its surrounding communities. Economic benefits to the regional economy would accrue as a direct result of reuse of NAS Cecil Field. As the level of economic activity in the region expands as a result of ARS 2, additional positive indirect economic impacts would also occur.

Implementation of this alternative is expected to create 1,266 direct jobs in the regional economy. Business park users and aviation manufacturing and repair companies are projected to supply this increase in economic opportunities (see Table 4-30).

In addition to the employment opportunities that would be directly created by the redevelopment of NAS Cecil Field, employment in the regional economy would also be indirectly increased by this alternative. Every additional job created and each additional dollar of earnings and output generated at the site would stimulate the regional economy and create more employment and business opportunities.

Implementation of ARS 2 is expected to create an estimated 2,800 jobs in the region if redevelopment proceeds as proposed, including the direct and indirect employment impacts of this alternative (The Arthur Andersen Group et al. n.d.). ARS 2 would also have a positive impact on the employee earnings and total income in the regional economy. Implementation of ARS 2 is expected to generate approximately $41 million in direct payroll and $32 million in indirect income throughout the regional economy (see Table 4-31). Aviation manufacturing and repair industries are expected to provide jobs with the highest average annual salaries ($35,000) (The Arthur Andersen Group *et al.* N.D.).

Table 4-30

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF ARS 2

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Phase 1: 1998-2004			
Business Park Users	333	320	653
Aviation Manufacturing/Repair	200	298	498
Total	533	618	1,151
Phase 2: 2005-2010			
Business Park Users	333	320	653
Aviation Manufacturing/Repair	400	596	996
Total	733	916	1,649
Total: Phase 1 and 2			
Business Park Users	666	640	1,306
Aviation Manufacturing/Repair	600	894	1,494
Total	1,266	1,534	2,800

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

Table 4-31

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF ARS 2

Industry/Employer	Direct Payroll	Indirect Earnings	Total Direct and Indirect Earnings
Phase 1: 1998-2004			
Business Park Users	9,990,000	6,693,300	16,683,300
Aviation Manufacturing/Repair	7,000,000	6,055,000	13,055,000
Total	$16,990,000	$12,748,300	$29,738,300
Phase 2: 2004-2010			
Business Park Users	9,990,000	6,693,300	16,683,300
Aviation Manufacturing/Repair	14,000,000	12,110,000	26,110,000
Total	$23,990,000	$18,803,300	$42,793,300
Total: Phase 1 and 2			
Business Park Users	19,980,000	13,386,600	33,366,600
Aviation Manufacturing/Repair	21,000,000	18,165,000	39,165,000
Total	$40,980,000	$31,551,600	$72,531,600

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

Taxes and Revenues

Following implementation of ARS 2, annual property tax revenues generated at the site are projected to reach $639,958, and the total assessed value of taxable property at the former NAS Cecil Field is anticipated to reach approximately $29.5 million (The Arthur Andersen Group et al. n.d.).

Annual operations and maintenance costs associated with this alternative are expected to range from $1.8 million to $4.1 million, while total capital costs are predicted to be approximately $13.4 million. An additional $3.3 million for capital improvements is also predicted to be incurred by other entities associated with the development of specific projects (The Arthur Andersen Group et al. n.d.).

Housing

Implementation of ARS 2 is not expected to have a significant impact on the housing market in the Jacksonville MSA. As described previously, this alternative is not projected to increase the total population in the region when compared to current conditions.

Education

Impacts associated with the implementation of ARS 2 would be similar to those caused by the Preferred Reuse Plan, although the change in population and the increase in property tax would be less than for the Preferred Reuse Plan.

Emergency and Medical Services

ARS 2 is anticipated to affect the provision of emergency and medical services in a similar manner as described for the Preferred Reuse Plan.

Recreation

The impacts associated with implementing ARS 2 would be similar to those described for ARS 1. However, the area dedicated to recreational facilities under this alternative would be slightly smaller than the area utilized for ARS 1.

4.7.4 Alternative Reuse Scenario 3

Population

Implementation of ARS 3 is expected to have a moderate impact on the population and demographic characteristics of the area immediately adjacent to the former Naval station, but only a minor impact on the Jacksonville MSA as a whole.

ARS 3 calls for the development of a new 3,250-unit residential community on portions of the former NAS Cecil Field. As a result of this residential development, the population on the former NAS Cecil Field would increase by 3,250 households or by an estimated 8,255 persons. These additional residents would have a moderate impact on the demographic characteristics of the communities in the surrounding area. This localized impact would be lessened to some extent because the construction and occupation of these housing units would be dispersed over a 12-year period.

Regionally, ARS 3 would have only a minor impact on the population and demographic characteristics of the Jacksonville MSA. Implementation of this scenario is projected to create approximately 2,550 direct jobs and 2,190 indirect jobs in the Jacksonville area (The Arthur Andersen Group et al. n.d.). As with all increases in economic activity, these additional employment opportunities would create an incentive for people to relocate to the area. However, the relative magnitude of the population impact on the region as a whole would be tempered by several factors including: the loss of employment resulting from the closure of NAS Cecil Field; the existence of unemployed and underemployed persons who currently reside in the region; the length of time being considered; and the size of the existing population.

In conclusion, implementation of ARS 3 would have a moderate impact to the population and demographics in the immediate vicinity of the former Naval station. On a regional level, ARS 3 is expected to have only a minor impact on the demographic and population characteristics of the Jacksonville area as a whole.

Economy, Employment, and Income

Implementation of ARS 3 would also have a positive impact on the Jacksonville economy. Under this alternative an estimated 2,550 direct and 2,190 indirect jobs would be created. As shown on Table 4-32, direct employment at the site would be diverse. The majority of job creation activities would be dispersed among light industrial establishments such as warehousing and distribution firms, manufacturing companies, and business park

users. In addition, a smaller number of jobs would be created by commercial enterprises (see Table 4-32).

As described previously, the additional economic activity that would result from implementation of ARS 3 would be multiplied to create additional employment and earnings in the regional economy. The indirect employment impacts of ARS 3 includes the creation of approximately 2,190 additional jobs in the economy (see Table 4-33).

As a direct result of ARS 3, approximately $53 million in payroll is predicted to be generated by industries/employers located at the former NAS Cecil Field. The indirect income that would be generated by this alternative is expected to reach slightly more than $41 million (see Table 4-33).

Under this ARS 3, business park users are expected to pay the highest average annual salaries ($30,000), while the warehouse and distribution companies are expected to pay the lowest average annual salaries ($15,000) (The Arthur Andersen Group et al. n.d.).

Taxes and Revenues

ARS 3 would generate approximately $7,520,376 in annual property tax revenues after its implementation. The proposed residential community is expected to supply approximately $5.7 million in annual property tax revenues, or more than 75% of the total property taxes generated annually under this alternative. Total assessed value of taxable property on the former Naval station is predicted to reach more than $430 million.

The costs to implement this alternative include annual operating and maintenance costs ranging from $1.8 million to $4.1 million, and one-time capital costs of approximately $57 million. Costs incurred by other agencies are expected to reach $170.8 million under this alternative (The Arthur Andersen Group et al. n.d.).

Housing

ARS 3 is anticipated to have a moderate impact on the regional housing market in the Jacksonville MSA. If implemented, ARS 3 would include the development of approximately 3,250 housing units at the former station, which would have an impact on the regional housing supply.

Although this alternative would significantly affect the supply of housing, it would have very little impact on the demand for housing. ARS 3 is expected to increase the total employment and the total population in the four-county area. However, when the cumulative impacts associated with closure and reuse are considered, the net change in population and employment is negative. The change in demand for housing is not expected to be as great as

Table 4-32

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF ARS 3

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Phase 1: 1998-2004			
Business Park Users	333	320	653
Commercial	0	0	0
Manufacturing	250	305	555
Warehouse/Distribution	400	384	784
Total	983	1,009	1,992
Phase 2: 2005-2010			
Business Park Users	400	383	783
Commercial	267	144	411
Manufacturing	500	270	770
Warehouse/Distribution	400	384	784
Total	1,567	1,181	2,748
Total: Phase 1 and 2			
Business Park Users	733	703	1,436
Commercial	267	144	411
Manufacturing	750	575	1,325
Warehouse/Distribution	800	768	1,568
Total	2,550	2,190	4,740

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

Table 4-33

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF ARS 3

Industry/Employer	Direct Payroll	Indirect Earnings	Total Direct and Indirect Earnings
Phase 1: 1998-2004			
Business Park Users	$9,990,000	$6,693,300	$16,683,300
Commercial	0	0	0
Manufacturing	$6,250,000	$6,687,500	$12,937,500
Warehouse/Distribution	$6,000,000	$5,340,000	$11,340,000
Total	$22,240,000	$18,720,800	$40,960,800
Phase 2: 2005-2010			
Business Park Users	$11,988,000	$8,031,960	$20,019,960
Commercial	$8,010,000	$5,366,700	$13,876,500
Manufacturing	$5,250,000	$3,727,500	$8,977,500
Warehouse/Distribution	$6,000,000	$5,340,000	$11,340,000
Total	$31,248,000	$22,466,160	$53,714,160
Total: Phase 1 and 2			
Business Park Users	$21,978,000	$14,725,260	$36,703,260
Commercial	$8,010,000	$5,366,700	$13,376,700
Manufacturing	$11,500,000	$10,415,000	$21,915,000
Warehouse/Distribution	$12,000,000	$10,680,000	$22,680,000
Total	$53,488,000	$41,186,960	$94,674,960

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

the change in supply of housing; therefore, implementation of ARS 3 may actually cause a decrease in the price of housing in the region.

Education

The regional impacts associated with ARS 3 would be similar to those described for the Preferred Reuse Plan. In addition, ARS 3 would significantly affect the schools located in the immediate vicinity of the former Naval station. ARS 3 calls for the construction of approximately 3,250 single family homes on the former NAS Cecil Field. This residential development would dramatically increase the number of students who would attend nearby schools. Although the overall enrollment in the Duval County School District is not expected to expand, specific schools in the district would be heavily impacted.

Emergency and Medical Services

The impacts associated with implementing ARS 3 would be similar to those described for the Preferred Reuse Plan.

Recreation

The impacts associated with implementing ARS 3 would be similar to those described for the Preferred Reuse Plan.

4.7.5 Alternative Reuse Scenario 4

Population

ARS 4 is projected to have only a minor impact on the population and demographics of Duval and Clay counties and on the Jacksonville MSA as a whole. As shown in Table 4-34, approximately 5,249 direct jobs and 4,758 indirect jobs are expected to be created by the implementation of this scenario (The Arthur Andersen Group et al. n.d.). The creation of these jobs would spur economic activity in the region and potentially create an incentive for people to relocate to the area.

However, based on the size of the regional economy and the previous loss of approximately 7,435 direct full-time military and civilian jobs due to the closure of NAS Cecil Field, the effect on the regional population is not expected to be significant. In addition, a large

Table 4-34

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF ARS 4

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Phase 1: 1998-2004			
State Department of Corrections	1,950	1,170	3,120
Juvenile Justice	100	60	160
Business Park Users	333	320	653
Commercial	0	0	0
Air Cargo	20	19	39
Aircraft Manufacturing/Repair	200	298	498
Manufacturing	250	305	555
Warehouse/Distribution	400	384	784
Total	3,253	2,556	5,809
Phase 2: 2005-2010			
State Department of Corrections	0	0	0
Juvenile Justice	0	0	0
Business Park Users	333	319	652
Commercial	133	72	205
Air Cargo	30	29	59
Aircraft Manufacturing/Repair	400	596	996
Manufacturing	500	610	1,110
Warehouse/Distribution	600	576	1,176
Total	1,996	2,202	4,198
Total: Phase 1 and 2			
State Department of Corrections	1,950	1,170	3,120
Juvenile Justice	100	60	160
Business Park Users	666	639	1,305
Commercial	133	72	205
Air Cargo	50	48	98
Aircraft Manufacturing/Repair	600	894	1,494

Key at end of table.

Table 4-34

TOTAL, DIRECT, AND INDIRECT EMPLOYMENT IMPACTS OF ARS 4

Industry/Employer	Direct Employment	Indirect Employment	Total Direct and Indirect Employment
Manufacturing	750	915	1,665
Warehouse/Distribution	1,000	960	1,960
Total	5,249	4,758	10,007

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

portion of the jobs created under this plan are predicted to be filled by unemployed or underemployed residents currently living in the Jacksonville area, thus decreasing the incentive for new residents to relocate to the area.

Economy, Employment, and Income

Implementation of ARS 4 is projected to create 5,249 direct jobs in the region. Under this plan, the State Department of Corrections would become the largest employer at the former military facility by employing approximately 1,950 persons. Other large employers at the site are expected to be warehousing and distribution facilities, manufacturing industries, business park users, and aircraft manufacturing and repair companies (see Table 4-34).

This initial job creation activity would induce additional economic growth in the regional economy. As these industries move to the former NAS Cecil Field they would likely hire employees from the Jacksonville area. As these new employees spend a portion of their additional disposable income in the regional economy and/or as these new industries purchase goods and services from the local suppliers, the income of other local businesses would expand. In response, these local businesses may hire more employees or expand their total output to multiply the positive economic effects of this initial injection of funds into the economy.

Under ARS 4, the direct employment at the former station is projected to create an additional 4,758 indirect jobs, raising the total employment resulting from the implementation of this plan to 10,007 jobs (see Table 4-34).

Additionally, it is anticipated that ARS 4 would generate approximately $118 million in direct payroll and $92 million in indirect earnings (see Table 4-35). The aircraft manufacturing/repair companies are expected to provide the highest paying jobs at the former NAS Cecil Field with average annual salaries of $35,000 while the commercial industries located at the site are expected to provide the lowest paying jobs with average annual salaries of $10,500 (The Arthur Andersen Group et al. n.d.).

Taxes and Revenues

Implementation of ARS 4 is predicted to generate an estimated $2,164,758 annually in property tax revenues, with the total assessed value of taxable property on the former Naval station reaching nearly $100 million (The Arthur Andersen Group et al. n.d.).

To implement ARS 4, it is expected that $1.8 million to $4.1 million will be spent annually on operation and maintenance costs, and approximately $71.2 million will be spent

Table 4-35

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF ARS 4

Industry/Employer	Direct Payroll	Indirect Earnings	Total Direct and Indirect Earnings
Phase 1: 1998-2004			
State Department of Corrections	$39,000,000	$22,400,000	$62,400,000
Juvenile Justice	1,800,000	1,080,000	2,880,000
Business Park Users	9,990,000	6,693,300	16,683,300
Commercial	0	0	0
Air Cargo	600,000	534,000	1,134,000
Aircraft Manufacturing/Repair	7,000,000	6,090,000	13,090,000
Manufacturing	6,250,000	6,687,500	12,937,500
Warehouse/Distribution	6,000,000	5,340,000	11,340,000
Total	$70,640,000	$49,824,800	$120,464,800
Phase 2: 2005-2010			
State Department of Corrections	$0	$0	$0
Juvenile Justice	0	0	0
Business Park Users	9,990,000	6,693,300	16,683,300
Commercial	1,396,500	991,515	2,388,015
Air Cargo	900,000	801,000	1,701,000
Aircraft Manufacturing/Repair	14,000,000	12,180,000	26,180,000
Manufacturing	12,500,000	13,375,000	25,875,000
Warehouse/Distribution	9,000,000	8,010,000	17,010,000
Total	$47,786,500	$42,050,815	$89,837,315
Total: Phase 1 and 2			
State Department of Corrections	$39,000,000	$23,400,000	$62,400,000
Juvenile Justice	1,800,000	1,080,000	2,880,000
Business Park Users	19,980,000	13,386,600	33,366,600
Commercial	1,396,500	991,515	2,388,015
Air Cargo	1,500,000	1,335,000	2,835,000
Aircraft Manufacturing/Repair	21,000,000	18,270,000	39,270,000

Key at end of table.

Table 4-35

TOTAL, DIRECT, AND INDIRECT INCOME IMPACTS OF ARS 4

Industry/Employer	Direct Payroll	Indirect Earnings	Total Direct and Indirect Earnings
Manufacturing	18,750,000	20,062,500	38,812,500
Warehouse/Distribution	15,000,000	13,350,000	28,350,000
Total	$118,426,500	$91,875,615	$210,302,115

Key:

ARS = Alternative Reuse Scenario.

Source: The Arthur Andersen Group et al. n.d.

on one-time capital costs. In addition, this plan would require more than $173 million to be spent on capital improvements by other government and private entities (The Arthur Andersen Group et al. n.d.).

Housing

ARS 4 is expected to have only a minor impact on the housing market in the City of Jacksonville and its surrounding communities. The proposed reuse of NAS Cecil Field is expected to increase the total employment and total population in the region over post-closure conditions. This projected increase in population would increase the demand for housing in the four-county area, possibly leading to a slight increase in the price of houses in the area compared to post-closure conditions.

However, when the impacts to the regional housing market from both the closure and reuse of NAS Cecil Field are considered, implementation of ARS 4 would have very little impact on the housing market in the City of Jacksonville or its surrounding communities compared to existing conditions. The increase in population and employment that would be created by implementing by this plan would not exceed the employment or population declines that will occur as a result of closure of NAS Cecil Field.

Education

Implementation of ARS 4 is expected to have only a minor impact on the provision of educational services in Clay and Duval counties. As described in previous sections, the increased economic activity that would occur as a result of the reuse of NAS Cecil Field would stimulate the regional economy and would create an incentive for some new residents to move into the area. Because some of the relocating persons would have families, the total number of school-aged children in the region would be affected.

However, when the loss of 7,435 direct full-time military and civilian jobs due to the closure of NAS Cecil Field is considered, the total population in the region is not expected to expand over current levels. Since the creation of 5,249 direct jobs under ARS 4 would not be sufficient to offset the negative economic impacts associated with the loss of 7,435 military and civilian jobs, ARS 4 is not anticipated to increase the total population or the total number of school-aged children in the region over existing levels.

When the impacts of both closure and reuse are considered, ARS 4 may have a slight positive impact on the school systems in Duval County. As described above, the total number of school-aged children is expected to decrease as a net result of closure and reuse. At the

same time, property tax revenues in Duval County are expected to increase as the land previously owned by the Navy will become taxable.

Emergency and Medical Services

ARS 4 is anticipated to have minor adverse impacts on the provision of fire, police, and ambulance services in the City of Jacksonville. The transfer of NAS Cecil Field from Navy ownership to private or local government ownership would increase the area to be serviced by local police, fire, and ambulance corps, and thereby increase their manpower and equipment needs. The negative effects caused by the increase in the area served by local emergency services would be slightly offset by the transfer of all public safety buildings and equipment (e.g., firehouses, police stations, vehicles) currently used by the Navy at NAS Cecil Field to the City of Jacksonville (CFDC 1996). In addition, implementation of ARS 4 would expand local government revenues through an increase in property tax collections. The additional property tax revenues in conjunction with the transfer of buildings and equipment should more than offset any financial burdens placed on the providers of emergency services.

ARS 4 is not expected to have a significant impact on the provision of medical service in the City of Jacksonville or its surrounding communities. Since the regional population is not expected to increase over existing levels, demand for medical services is expected to remain at its current level. Since no change in the supply of medical services is anticipated as a result of the preferred alternative, no change in the provision of medical services in the Jacksonville area is projected.

Recreation Services

Implementation of ARS 4 would positively impact the provision of recreational facilities in the Jacksonville area. Under this alternative, the majority of NAS Cecil Field's existing golf course, athletic fields, and other recreational facilities would be managed by the City of Jacksonville, thereby increasing the recreational facilities available to local residents.

4.7.6 Cumulative Impacts

Past and reasonably foreseeable future actions that could result in cumulative socioeconomic impacts when added to the actions associated with the Preferred Reuse Plan are: job losses associated with the closure of NAS Cecil Field and changes in military employment associated with other BRAC 1993 and BRAC 1995 actions in the region. The

following sections discuss the cumulative implications of these actions when added to the actions associated with the Preferred Reuse Plan.

Population

The cumulative impacts of BRAC 1993 and BRAC 1995 actions and the Preferred Reuse Plan would result in a net increase in the population in the Jacksonville MSA. As described in the following sections, total direct employment in the region would increase by 2,351 positions. The creation of these jobs would spur economic activity in the region and create an incentive for people to relocate to the area, and total population in the Jacksonville MSA would expand as a result.

Economy, Employment, and Income

The cumulative effects of closure of NAS Cecil Field, the implementation of the Preferred Reuse Plan, and the completion of several other separate BRAC 1993 and BRAC 1995 actions would be to increase the total direct employment in the Jacksonville area by 2,351 jobs. As shown on Table 4-36, BRAC 1993 recommendations affecting the Jacksonville MSA would result in a net loss of 4,033 military positions but would create 1,217 new civilian positions. Likewise, BRAC 1995 actions would increase the total number of DoD civilian jobs in the area by 67 positions and increase the number of military billets in the region by 1,901 positions. When these actions are included with effects of the Preferred Reuse Plan, the creation of 4,483 new civilian jobs is expected. However, total military employment in the region is expected to decrease by 2,132 positions, creating a net increase of 2,351 jobs in the Jacksonville regional economy (see Table 4-36).

The creation of 2,351 additional jobs in the local economy would result in a substantial increase in employee earnings. As described in previous sections, this increase in direct employment would also increase employment and income in other sectors of the economy. As these industries and military installations hire employees from the Jacksonville area and as these new employees spend a portion of their additional disposable income in the regional economy, the income of other local businesses would expand. In response, these local businesses may hire more employees or expand their total output to multiply the positive economic effects of this initial injection of funds into the economy.

Thus, the cumulative impact of these BRAC actions and implementation of the Preferred Reuse Plan would create substantial indirect employment and income effects in the regional economy. These indirect effects, while not quantified, are projected to be significant.

Table 4-36

CUMULATIVE REGIONAL ECONOMIC IMPACTS OF BRAC 1993 AND BRAC 1995 ACTIONS AND IMPLEMENTATION OF THE PREFERRED REUSE PLAN

Command/Alternative	Civilian Employment Impacts	Military Employment Impacts	Total Employment Impacts
BRAC 1993			
NADEP	+1,683	+204	+1,887
Defense Distribution Depot	+250	+3	+253
NAS Jacksonville	+77	+152	+229
NAS Cecil Field	-813	-6,622	-7,435
NAVSTA Mayport	+8	+2,138	+2,146
Naval Hospital	+12	+92	+104
BRAC 1993 Impact	+1,217	-4,033	-2,816
BRAC 1995			
NADEP	+40	0	+40
NAS Jacksonville	+27	+1,901	+1,968
BRAC 1995 Impact	+67	+1,901	+1,968
NAS Cecil Field Preferred Reuse Plan			
Preferred Reuse Plan	+3,199	0	+3,199
Total Cumulative Impacts	+4,483	-2,132	+2,351

Key:

BRAC = Base Closure and Realignment Act.
NAVSTA = Naval Station.

Source: Mayor's Commission on Base Closure and Realignment 1995; Arthur Andersen et al. 1995.

Housing

As described above, the total population in the Jacksonville MSA is expected to increase as a result of the cumulative effects of implementation of the Preferred Reuse Plan and the 1993 and 1995 BRAC actions. This increase in population would also increase the demand for housing in the region. Because the supply of housing is not expected to change as a direct result of these actions, housing vacancy rates can be expected to decrease and housing prices may increase slightly. However, these impacts would be moderated by the relative size of the Jacksonville MSA and by the construction of additional residential buildings.

Taxes and Revenues

The cumulative effects of implementing the Preferred Reuse Plan and completing BRAC 1993 and BRAC 1995 actions would have a positive fiscal impact on local governments in the Jacksonville MSA. The increased economic activity and the expanded regional population would increase local property values and expand the local tax base.

Local government expenditures would also increase as additional services and facilities would have to be provided to the new residents. However, the increase in taxes generated should more than offset these additional expenditures.

Education

As described in previous sections, the cumulative impact of the Preferred Reuse Plan and completion of the BRAC 1993 and BRAC 1995 actions would result in an increase in the regional population. This increase in population would have a moderate impact on the provision of educational services by increasing the total number of students attending public schools in the region. The total impact to the school districts would be limited by the length of time over which the expansion would occur and the relative size of the Jacksonville area. In addition, any increase in expenditures made by the local school districts to accommodate these new students is expected to be covered by the increase in local tax revenues.

Emergency and Medical Services

The cumulative effects of the Preferred Reuse Plan and the BRAC actions are anticipated to have a minor adverse impact on the provision of fire, police, and ambulance services in the City of Jacksonville. The transfer of NAS Cecil Field from Navy ownership to private or local government ownership would increase the area that would need to be

serviced by local police, fire and ambulance corps, and thus increase their manpower and equipment needs. The negative effects caused by the increase in the area served by local emergency services would be slightly offset by the transfer of all public safety buildings and equipment (e.g., firehouses, police stations, vehicles) at NAS Cecil Field to the City of Jacksonville (CFDC 1996).

The cumulative population effects would also increase the demand for emergency and medical services in the region. However, the local government revenues generated by the increase in property tax collections in conjunction with the transfer of buildings and equipment should more than offset any financial burdens placed on the providers of emergency and medical services in the region.

Recreation

Cumulatively, the disposal and reuse of the station and the other BRAC actions are anticipated to have a positive impact on the provision of recreational services in the City of Jacksonville. The cumulative population effects of these actions would increase the demand for recreational facilities throughout the region. However, the increased recreational facilities that would become available to the general public should more than offset this increase in demand.

4.7.7 Mitigation Measures

No significant adverse socioeconomic impacts would result from implementation of the Preferred Reuse Plan. Therefore no mitigation is proposed.

4.8 Transportation

This section summarizes the potential impacts to the transportation systems surrounding NAS Cecil Field resulting from the implementation of various reuse scenarios proposed by CFDC. The transportation systems analyzed include roadways, air, and rail facilities.

Road Network

The impact of the various reuse scenarios on local and regional roads was evaluated using the standard analysis techniques of projecting trip generation, trip distribution, and trip assignment. The number of vehicular trips generated from a specific land use was estimated based on employment, square footage, number of dwelling units, or development acreage. Trip generation rates were estimated from the Institute of Transportation Engineers (ITE) Trip

Generation Manual (ITE 1991). Each proposed reuse scenario advocated a different theme, mixture, and intensity of development. Consequently, the various scenarios generate different intensities of aggregated trip volumes.

Based on the conceptual nature of the reuse scenarios, it is difficult to identify specific improvements to the on-station transportation network that would be necessary to better facilitate traffic circulation. Because redevelopment plans are conceptual and provide no specific structural schematics for the reuse alternatives, the internal transportation layout is assumed to be similar to the existing layout. It is assumed that as new developments evolve, additional access routes to the external transportation system may be necessary.

The trips that were projected to be generated from new land uses developed on the property were distributed onto the roadways within the established region of influence based on the assumption that route choice will attempt to minimize travel distance, time, and congestion by selecting routes with minimal existing traffic volumes and adequate levels of service. The residential distribution of projected employment generated through reuse plan implementation was assumed to be similar to that of the distribution of civilian personnel currently employed at NAS Cecil Field. This assumption is based on the fact that the majority of trips would be home-based work trips, with the realization that trips related to raw materials delivery, product shipment, and other business-related trips could be potentially misrepresented by this distribution.

Future traffic conditions were based on projections supplied by the Jacksonville Metropolitan Planning Organization (MPO) to reflect projected changes in population, land use, socioeconomics, and anticipated improvements to the roadway network. Projected traffic under each plan was added to various roadway projections, and the LOS was calculated for each major road segment within the region of influence to reflect the impact of the Preferred Reuse Plan and each ARS. LOS parameters are based on Florida's Level of Service Standards and Guidelines Manual for Planning (FDOT 1995).

Mass Transit

Following the closure of NAS Cecil Field, transit service may prove unfeasible due to the relatively low development densities on the southwestern side of the City of Jacksonville. Without a large trip generator consisting of a relatively high number of captive riders (riders with limited options to mass transit), JTA may find that insufficient numbers exist, at least in the initial redevelopment stages, to provide service to the project area.

Rail Facilities

The close proximity of major rail facilities to NAS Cecil Field, along with existing rail rights-of-way on the property, would provide a beneficial attribute to redevelopment. The industrial/mixed use nature of a scenario would be enhanced by the development potential associated with existing and new rail corridors. These rail lines could act as vital transportation corridors offering newly developed land uses with competitive advantages in product transport and distribution capabilities.

Airport Facilities

If the airfields on the station are to be reused for aviation-related purposes, an FAA airspace analysis and airport master plan would be necessary to evaluate the specific effects that the reuse would have on safe and efficient use of airspace. The flights related to reuse activities would have to be integrated into the airspace control system for commercial, military, and general aviation flights within the Jacksonville region. Generalized LTO projections have been provided by the CFDC for those alternatives proposing reuse of aviation infrastructure.

4.8.1 Preferred Reuse Plan

Roadway Network

At the completion of Phase 1 development, approximately 9,175 average daily trips are projected, while 1,106 peak-hour trips are projected. Implementation of Phase 2 development is estimated to generate a total of 14,239 average daily trips and 1,678 peak-hour trips. Table 4-37 displays trips generated for proposed land uses under the Preferred Reuse Plan. Figures 4-13 and 4-14 display the traffic conditions associated with the Preferred Reuse Plan. Trips projected to be generated by the Preferred Reuse Plan were added to the Jacksonville MPO's projected traffic volumes for 2004 and 2010.

Roadways within the region influenced by the Preferred Reuse Plan would experience a slight increase in traffic volumes over the MPO's projected levels. In most cases the Preferred Reuse Plan would not result in a significant modification of projected LOS on the roads. Table 4-38 displays the MPO's projected traffic volumes, traffic volumes resulting from redevelopment, and the associated LOSs.

Overall, proposed development would add very little new traffic on roads surrounding the station. The only roads that would experience significant LOS changes would be portions

Table 4-37

TRIP GENERATION FOR THE PREFERRED REUSE PLAN

Land Use	Impact	Total Trips/Day	Total Trips/ Peak Hour
Phase 1: 1998-2004			
Light Industrial	1,000,000 sf	2,792	248
Business Park	250,000 sf	2,003	242
Heavy Industrial	250,000 sf	375	170
Aviation/Air Cargo	440,000 sf	4,005	446
Total Trips	1,940,000 sf	9,175	1,106
Phase 2: 2005-2010			
Commercial	100,000 sf	5,450	510
Aviation/Air Cargo	550,000 sf	1,601	178
Light Industrial	1,500,000 sf	4,188	372
Business Park	300,000 sf	2,250	278
Heavy Industrial	500,000 sf	750	340
Total Trips	2,950,000 sf	14,239	1,678

Key:

sf = Square feet.

Source: ITE 1991; CFDC 1996.

Table 4-38

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR THE PREFERRED REUSE PLAN[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	3,092	B	3,093	B	3,472	B	3,475	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	5,163	B	5,189	B	7,506	B	7,576	B
Beaver Street West	Chaffee Road - I-295	6,130	B	6,169	B	6,793	B	6,898	B
I-10	US 301 - CSX Railroad	55,216	D	55,255	D	67,490	E	67,596	E
I-10	CSX - I-295	60,962	E	60,138	E	77,564	F	78,039	F
Normandy Boulevard	US 301 - 103rd Street	12,561	D	12,673	D	14,024	E	14,326	F
Normandy Boulevard	103rd Street - Chaffee Road	19,332	C	21,376	D	19,489	C	25,002	D
Normandy Boulevard	Chaffee Road - Herlong Road	18,498	C	20,244	C	24,409	C	29,119	C
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	19,465	D	22,825	D	23,141	D	32,203	D
103rd Street (SR 134)	Old Middleburg Road - I-295	35,545	D	37,434	D	39,656	D	44,752	E
Chaffee Road	Normandy Boulevard - 103rd Street	3,712	C	4,061	C	13,633	C	14,575	C

Key at end of table.

Table 4-38

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR THE PREFERRED REUSE PLAN[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Chaffee Road	I-10 - Normandy Boulevard	5,018	C	5,470	C	9,666	C	10,886	D
Chaffee Road	Beaver Street - I-10	12,887	D	12,970	E	14,034	E	14,257	F
Yellow Water Road	Normandy Boulevard - Beaver Street	1,123	C	1,133	C	3,623	C	3,659	C
Otis Road	Nassau County Line - 103rd Street	1,646	C	1,656	C	1,787	C	1,813	C
Old Plank Road	Otis Road - Jones Road	6,973	D	6,976	D	7,462	D	7,470	D
Halsema Road	South of Whitehouse - Beaver Street	2,170	C	2,203	C	2,533	C	2,623	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	4,428	C	4,602	C	5,761	D	6,231	D
Old Middleburg Road	Clay County Line - 103rd Street	14,516	F	14,566	F	15,308	F	15,442	F
Blanding Boulevard (SR 21)	Clay County Line - I-295	102,002	F	102,563	F	108,161	F	109,674	F
Blanding Boulevard	Wells Road - Duval County Line	97,954	F	98,515	F	95,870	F	97,383	F
Wells Road	Blanding Boulevard - DeBarry Avenue	28,945	E	28,991	E	37,651	F	37,776	F

Key at end of table.

Table 4-38

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR THE PREFERRED REUSE PLAN[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	24,606	F	24,652	F	25,396	F	25,521	F
College Drive (SR 224)	Blanding Boulevard - Remington Court	16,839	F	16,848	F	25,784	F	25,809	F
College Drive	Remington Court - Bald Eagle Road	12,446	D	12,455	D	15,934	F	15,959	F
I-295	SR 13 - SR 15	120,081	D	1,202	D	142,806	E	143,248	F
I-295	SR 15 - SR 21	91,172	E	91,444	E	107,559	F	108,292	F
I-295	SR 21 - SR 134	98,589	E	99,786	E	102,607	E	105,834	E
I-295	SR 134 - SR 228	95,666	E	95,835	E	102,865	E	103,320	E
I-295	SR 228 - I-10	100,987	E	101,112	E	109,548	F	109,886	F
I-295	I-10 - SR 15	58,208	D	58,424	D	68,229	F	68,812	F
I-295	SR 15 - SR 104	57,469	D	57,484	D	69,589	F	69,629	F
I-295	SR 15 - SR 115	48,738	D	48,747	D	59,352	D	59,377	D
I-295	SR115 - I-95	51,260	D	51,282	D	62,567	E	62,675	E
Roosevelt Boulevard (US 17)	Clay County Line - SR 134	53,476	F	53,525	F	61,974	F	62,106	F
US 301 S	Clay County Line - SR 228	21,999	B	22,141	B	25,989	C	26,372	C

Key at end of table.

Table 4-38

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR THE PREFERRED REUSE PLAN[a]

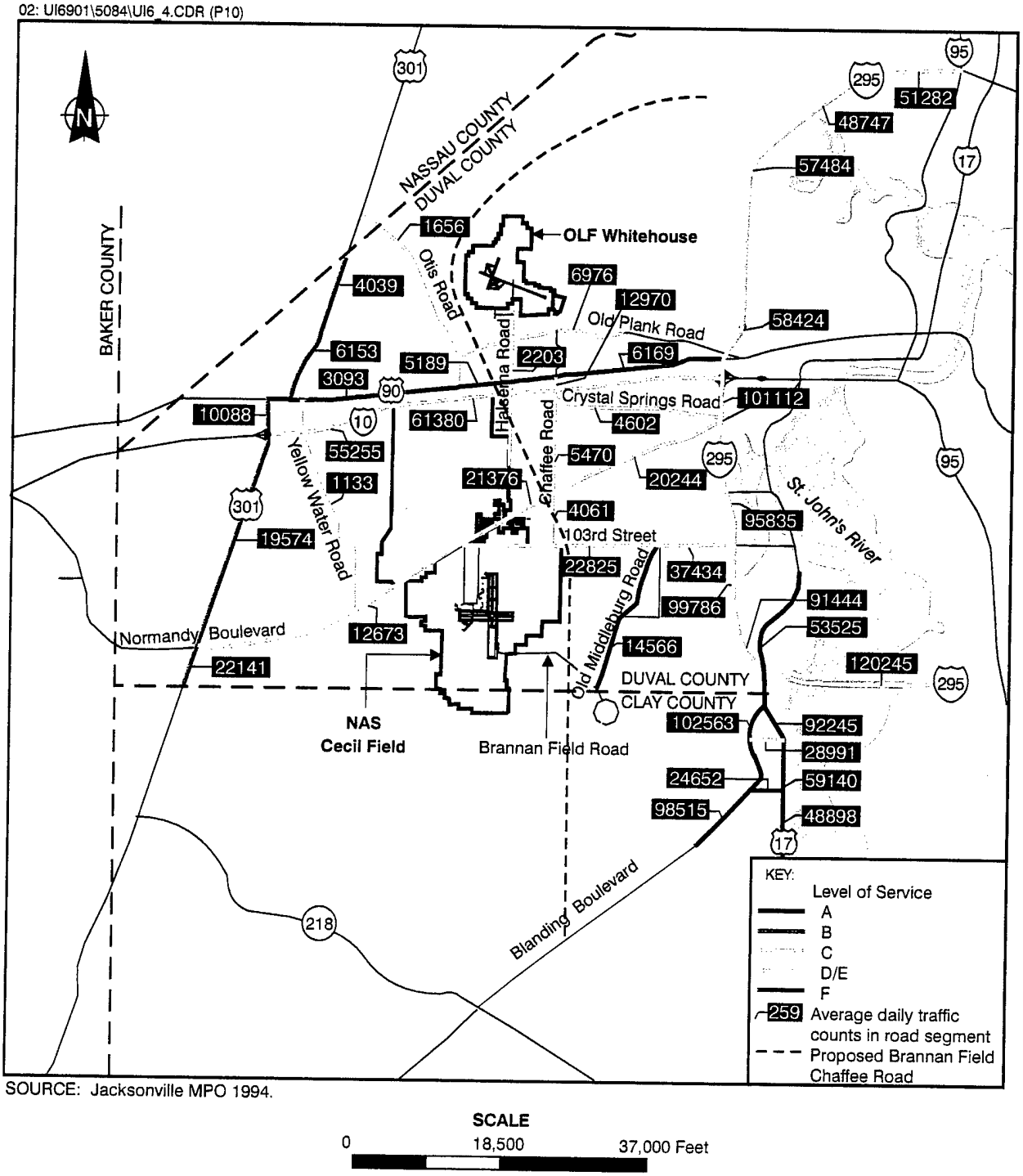
Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
US 301 S	SR 228 - I-10	19,531	B	19,574	B	23,523	B	23,639	B
US 301 S	I-10 - US90	10,065	B	10,088	B	12,281	B	12,342	B
N US 301	US 90 - N. Baldwin City Limits	6,133	B	6,153	B	6,407	B	6,462	B
N US 301	N. Baldwin City Limits - Nassau County Line	4,021	B	4,039	B	4,564	B	4,613	B
US 17	Clay County Line - Wells Road	92,187	F	92,245	F	102,177	F	102,332	F
US 17	Wells Road - SR 224	59,125	F	59,140	F	78,997	F	79,038	F
US 17 Bridge	Doctors Inlet Bridge	48,883	F	48,898	F	63,302	F	63,343	F

a Shaded rows indicate road segments that would experience a deterioration in LOS as a result of redevelopment of NAS Cecil Field.
b Future projections of regional traffic growth conducted by the Jacksonville MPO, assuming closure of NAS Cecil Field with no redevelopment activity.

Key:

LOS = Level of service.
SR = State Road.

Source: Jacksonville MPO 1996.



SOURCE: Jacksonville MPO 1994.

Figure 4-13 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD PREFERRED REUSE PLAN, PHASE 1

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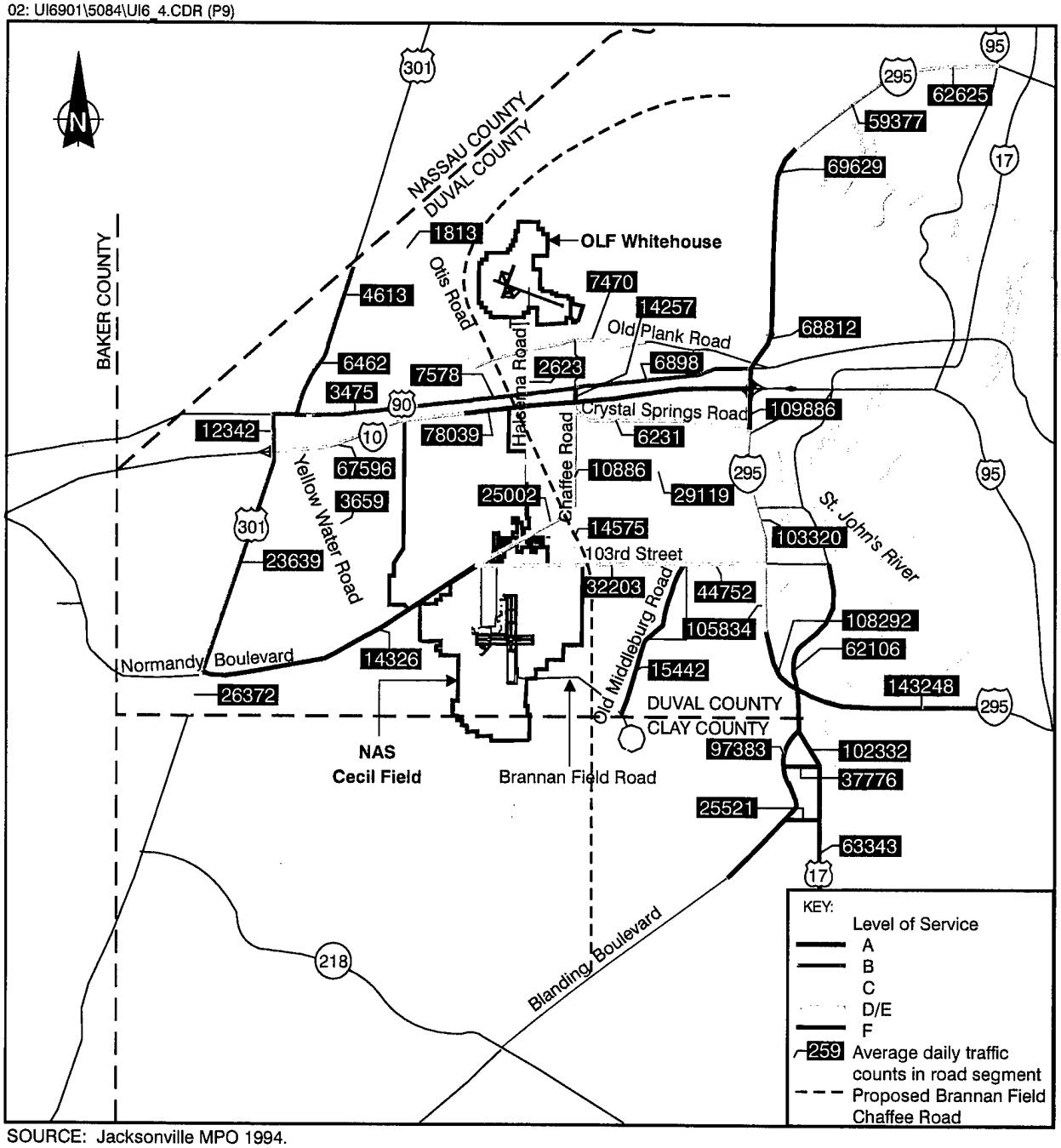

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-14 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD PREFERRED REUSE PLAN, PHASE 2

of Chaffee Road, Normandy Boulevard, and 103rd Street. These deficiencies are projected to occur at the end of Phase 2, and would be addressed by already planned improvements to the regional roadway network discussed in Section 4.8.7.

Mass Transit

Mass transit service to the southwestern extent of the Jacksonville service district may be canceled due to a lack of sufficient density; the relative seclusion of the property would potentially result in a subsequent lack of ridership to support service in the initial phases of redevelopment. Transportation demand/supply management programs, such as flexible work schedules, carpooling incentives, parking fees, and reduced parking space availability, may promote the use of alternative transportation modes while serving as a mitigation effort for traffic volumes generated from reuse.

Rail Facilities

No rail service is currently planned for this alternative, but freight service may become feasible as development occurs. A planned transportation corridor is identified in this plan to utilize the existing rail right-of-way. If this or another right-of-way is secured, it could be utilized to provide rail as well as vehicular access to the land uses on the northern portion of the base. Should the installation of rail facilities prove feasible, it would provide businesses on the property access to the CSX line to the north, and would provide alternative options for raw material deliveries and shipment of finished products.

Airport Facilities

The Preferred Reuse Plan proposes reuse of existing runways. This reuse would provide for general aviation and cargo activities to utilize existing aviation-related infrastructure. The volume and types of existing and projected air traffic are presented in Table 4-39.

The station is being incorporated into the overall Florida Aviation System Plan. As was noted previously, the FAA will have to develop an airport master plan coordinating airspace utilization, safety, and air traffic control requirements. Therefore, no significant impacts to air facilities would result.

Table 4-39

PRE-CLOSURE AND PROJECTED ANNUAL AIRCRAFT OPERATIONS FOR THE PREFERRED REUSE PLAN

Aircraft Type	Current LTO Cycles	Projected LTO Cycles	
		Phase 1	Phase 2
Pre-closure Operations			
C-12	736	NA	NA
F/A-18	133,206	NA	NA
S-3	38,269	NA	NA
T-34C	2,944	NA	NA
Projected Operations			
AH-64	NA	1,450	3,300
UH-60	NA	425	875
OH-58	NA	1,325	875
Single-Engine Piston	NA	10,000	15,000
Twin-Engine Piston	NA	10,000	20,000
Turbo Prop	NA	15,000	25,000
Corporate Jet	NA	15,000	20,000
Large Jet	NA	5,000	10,000
TOTAL	175,155	60,200	98,050

Key:

LTO = Landings and takeoffs.
NA = Not applicable.

Source: EPA 1992.

4.8.2 Alternative Reuse Scenario 1

Roadway Network

At the completion of Phase 1 development under ARS 1, approximately 9,223 average daily trips are projected and 1,291 peak-hour trips are projected. Implementation of Phase 2 development is estimated to generate a total of 11,226 average daily trips and 1,533 peak-hour trips. Table 4-40 displays trips generated for proposed land uses in ARS 1.

Under ARS 1, roadways within the region would experience some increases in traffic volumes over the MPO's projected traffic levels. Although ARS 1 results in the smallest increase in traffic volumes, deterioration of LOS would be experienced on portions of Normandy Boulevard, 103rd Street, and Chaffee Road. Table 4-41 displays projected baseline traffic volumes, traffic volumes resulting from station redevelopment, and associated LOSs for ARS 1. Figures 4-15 and 4-16 display the traffic conditions resulting from Phase 1 and Phase 2 of ARS 1.

Mass Transit

Based on the limited amount of development proposed in ARS 1, it is unlikely that the necessary density could be achieved to justify continued transit service.

Rail Facilities

No rail facility connection is proposed with ARS 1.

Airport Facilities

Use of airport facilities under ARS 1 would be limited to helicopter operations. No significant impacts would occur.

4.8.3 Alternative Reuse Scenario 2

Roadway Network

Traffic generated from the new land uses proposed in ARS 2 would result in approximately 5,868 average daily trips by the end of Phase 1, with 676 peak-hour trips projected. Implementation of Phase 2 development is estimated to generate a total of 9,263 average daily trips and 1,077 peak-hour trips. Table 4-42 displays trips generated for proposed land uses in ARS 2.

Table 4-40

TRIP GENERATION FOR ARS 1

Land Use	Impact	Total Trips/ Day	Total Trips/ Peak Hour
Phase 1			
Market-Driven Development	250,000 sf	2,003	242
Helicopter Operations	300,000 sf	3,220	716
Parks/Recreation and Recreation/Forestry	16,000 ac	4,000	333
Total Trips		9,223	1,291
Phase 2			
Market-Driven Development	250,000 sf	2,003	242
Total Trips		11,226	1,533

Key:

ac = Acres.
ARS = Alternative Reuse Scenario.
sf = Square feet.

Table 4-41

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 1[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	3,092	B	3,093	B	3,472	B	3,474	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	5,163	B	5,192	B	7,506	B	7,541	B
Beaver Street West	Chaffee Road - I-295	6,130	B	6,173	B	6,793	B	6,845	B
I-10	US 301 - CSX Railroad	55,216	D	55,259	D	67,490	E	67,543	E
I-10	CSX - I-295	60,962	E	61,156	E	77,564	F	77,800	F
Normandy Boulevard	US 301 - 103rd Street	12,561	D	12,684	D	14,024	E	14,174	F
Normandy Boulevard	103rd Street - Chaffee Road	19,332	C	21,579	C	19,489	C	22,224	D
Normandy Boulevard	Chaffee Road - Herlong Road	18,498	C	20,418	C	24,409	C	26,746	C
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	19,465	D	23,158	D	23,141	D	27,637	D
103rd Street (SR 134)	Old Middleburg Road - I-295	35,545	D	37,622	F	39,656	D	42,184	E
Chaffee Road	Normandy Boulevard - 103rd Street	3,712	C	4,096	C	13,633	C	14,101	C
Chaffee Road	I-10 - Normandy Boulevard	5,018	C	5,515	C	9,666	C	10,271	D
Chaffee Road	Beaver Street - I-10	12,887	D	12,978	E	14,034	E	14,145	F
Yellow Water Road	Normandy Boulevard - Beaver Street	1,123	C	1,134	C	3,623	C	3,646	C
Otis Road	Nassau County Line - 103rd Street	1,646	C	1,656	C	1,787	C	1,800	C

Table 4-41

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 1[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS
Old Plank Road	Otis Road - Jones Road	6,973	D	6,976	D	7,462	D	7,466	D
Halsema Road	South of Whitehouse - Beaver Street	2,170	C	2,207	C	2,533	C	2,578	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	4,428	C	4,620	C	5,761	D	5,994	D
Old Middleburg Road	Clay County Line - 103rd Street	14,516	F	14,571	F	15,308	F	15,308	F
Blanding Boulevard (SR 21)	Clay County Line - I-295	102,002	F	102,619	F	108,161	F	108,911	F
Blanding Boulevard	Wells Road - Duval County Line	97,954	F	98,571	F	95,870	F	96,620	F
Wells Road	Blanding Boulevard - DeBarry Avenue	28,945	E	28,996	E	37,651	F	37,713	F
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	24,606	F	24,657	F	25,396	F	25,458	F
College Drive (SR 224)	Blanding Boulevard - Remington Court	16,839	F	16,849	F	25,784	F	25,796	F
College Drive	Remington Court - Bald Eagle Road	12,446	D	12,456	D	15,934	F	15,946	F
I-295	SR 13 - SR 15	120,081	D	120,261	D	142,806	E	143,025	E
I-295	SR 15 - SR 21	91,172	E	91,471	E	107,559	F	107,923	F
I-295	SR 21 - SR 134	98,589	E	99,904	E	102,607	E	104,208	E

Key at end of table.

Table 4-41

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 1[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005-2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volumes Generated From Proposed Base Redevelopment	LOS
I-295	SR 134 - SR 228	95,666	E	95,852	E	102,865	E	103,091	E
I-295	SR 228 - I-10	100,987	E	101,125	E	109,548	F	109,716	F
I-295	I-10 - SR 15	58,208	D	58,446	D	68,229	F	68,518	F
I-295	SR 15 - SR 104	57,469	D	57,485	D	69,589	F	69,609	F
I-295	SR 15 - SR 115	48,738	D	48,748	D	59,352	D	59,364	D
I-295	SR 115 - I-95	51,260	D	51,284	D	62,567	E	62,596	E
Roosevelt Boulevard (US17)	Clay County Line - SR 134	53,476	F	53,530	F	61,974	F	62,039	F
US 301 S	Clay County Line - SR 228	21,999	B	22,155	B	25,989	C	26,179	C
US 301 S	SR 228 - I-10	19,531	B	19,578	B	23,523	B	23,580	B
US 301 S	I-10 - US 90	10,065	B	10,090	B	12,281	B	12,311	B
N US 301	US90 - N. Baldwin City Limits	6,133	B	6,155	B	6,407	B	6,434	B
N US 301	N. Baldwin City Limits - Nassau County Line	4,021	B	4,041	B	4,564	B	4,588	B
US 17	Clay County Line - Wells Road	92,187	F	92,250	F	102,177	F	102,254	F
US 17	Wells Road - SR 224	59,125	F	59,142	F	78,997	F	79,017	F
US 17 Bridge	Doctors Inlet Bridge	48,883	F	48,900	F	63,302	F	63,322	F

Key at end of table.

[a] Shaded rows indicate road segments that would experience a deterioration in LOS as a result of redevelopment of NAS Cecil Field.
[b] Future projections of regional traffic growth conducted by the Jacksonville MPO, assuming closure of NAS Cecil Field with no redevelopment activity.

Key:

ARS = Alternative Reuse Scenario.
LOS = Level of service.
SR = State Road.

Source: Jacksonville MPO 1996.

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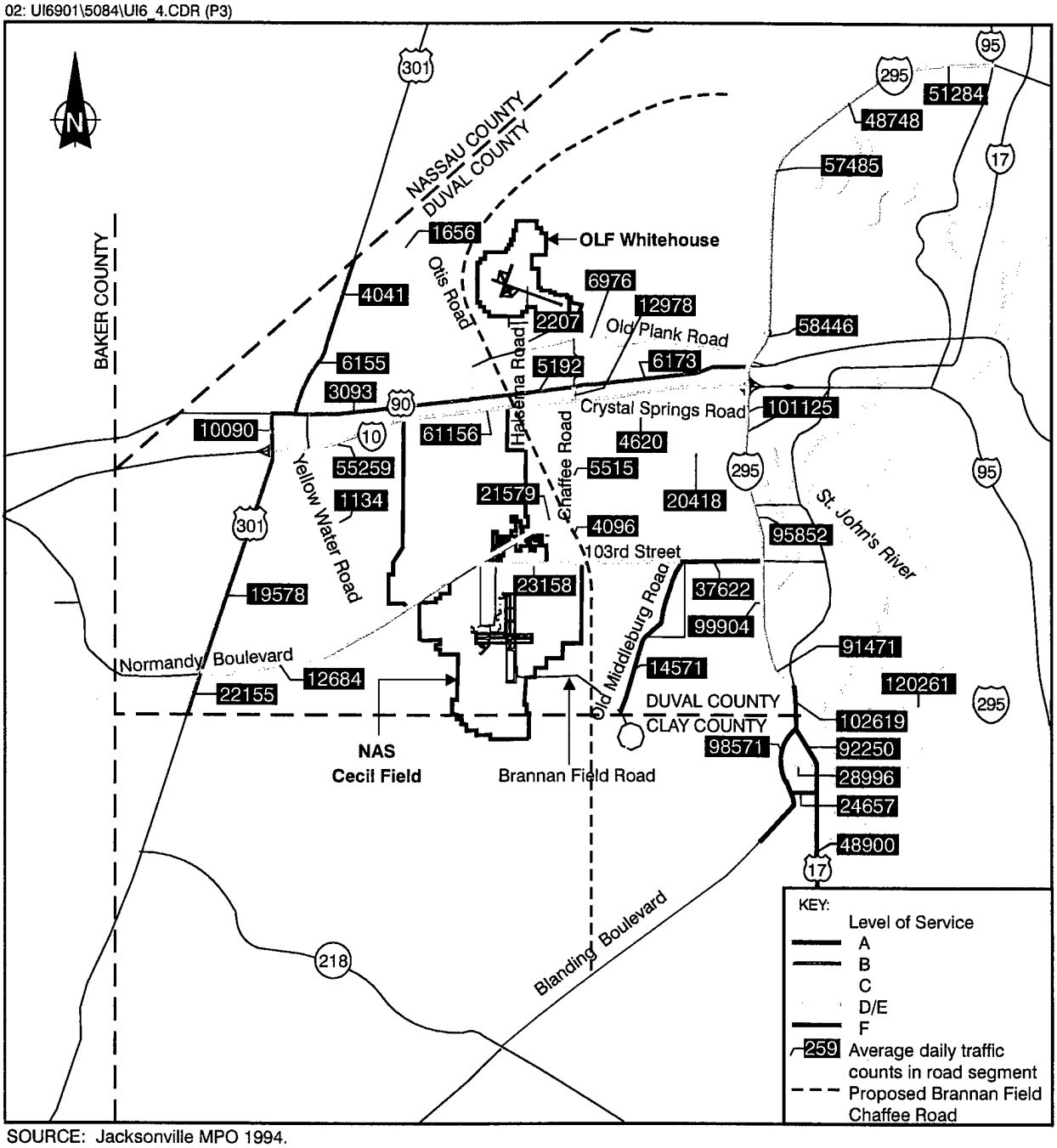

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-15 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 1, PHASE 1

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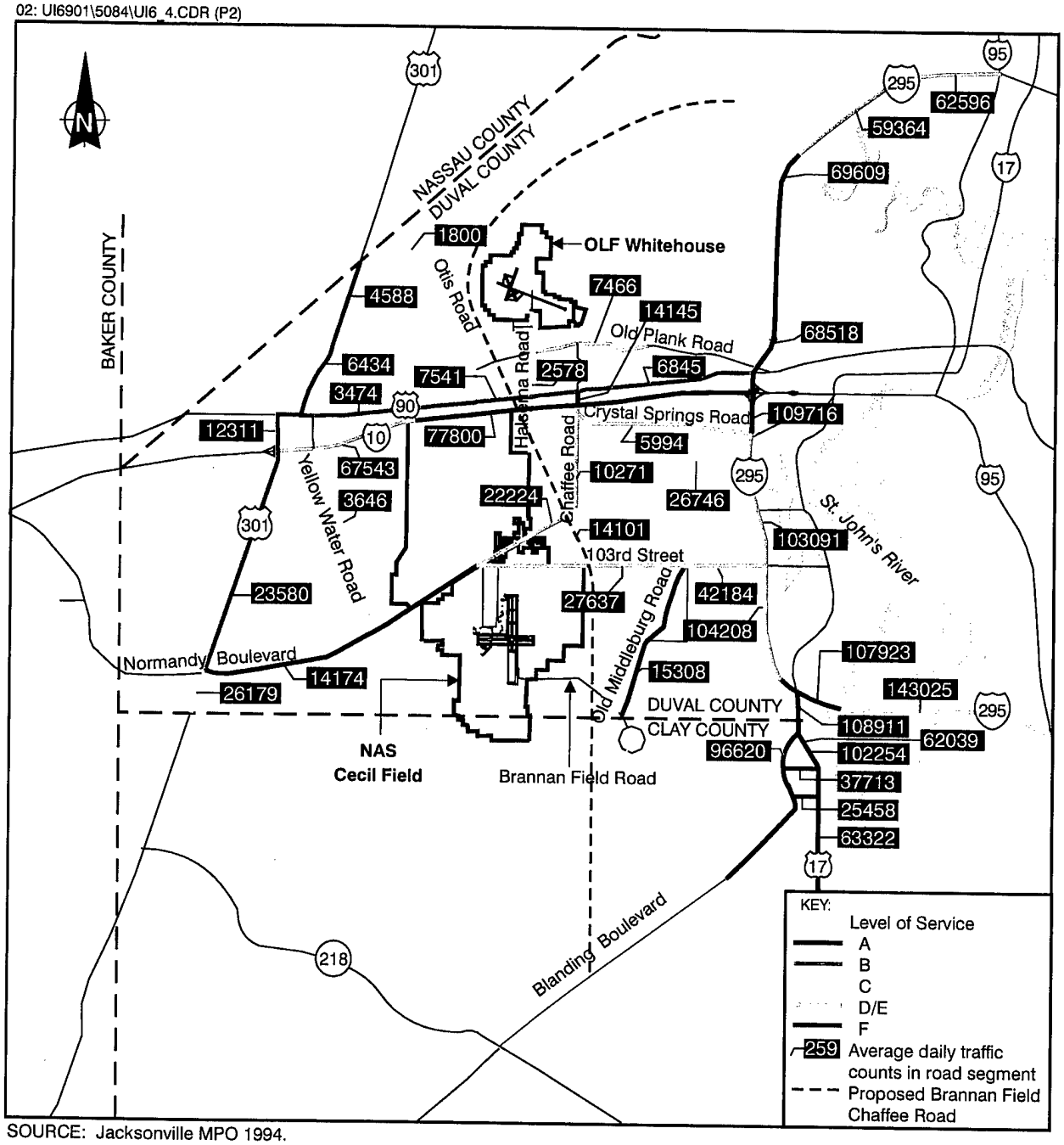

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-16 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 1, PHASE 2

Table 4-42

TRIP GENERATION FOR ARS 2

Land Use	Impact	Total Trips/Day	Total Trips/ Peak Hour
Phase 1			
Market-Driven Development	250,000 sf	2,003	242
General Aviation	400,000 sf	3,865	434
Total Trips		5,868	676
Phase 2			
General Aviation	200,000 sf	2,003	242
Market-Driven Development	250,000 sf	1,392	159
Total Trips		9,263	1,077

Key:

ARS = Alternative Reuse Scenario.
sf = Square feet.

Roadways within the region influenced by ARS 2 would experience an increase in traffic volumes over the MPO's projected traffic levels. In most cases, however, this would not result in a significant modification of LOS on the roads. Table 4-43 displays the MPO's projected traffic volumes, traffic volumes resulting from the redevelopment of the property, and their associated LOSs. Figures 4-17 and 4-18 display the traffic conditions resulting from Phases 1 and 2 of ARS 2.

The projected deterioration of LOSs on specific roadways would be addressed through already planned roadway improvements in the area surrounding the station, as discussed in Section 3.8. Therefore, ARS 2 would result in no significant impacts.

Mass Transit

Mass transit service to this southwestern portion of Jacksonville would likely be canceled due to a lack of sufficient ridership to support service during the initial phases of redevelopment.

Rail Facilities

No rail facilities are proposed for this reuse alternative.

Airport Facilities

ARS 2 proposes reuse of the existing runways for general aviation and cargo activities to utilize existing aviation-related infrastructure. The volume and types of air traffic generated from this alternative are the same as those associated with the Preferred Reuse Plan (see Table 4-39).

The station is presently being incorporated into the overall Florida Aviation System Plan. As was noted previously, the FAA will have to develop an airport master plan to coordinate airspace utilization, safety, and air traffic control requirements. Therefore, no impacts to air facilities would occur as a result of ARS 2.

Table 4-43

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 2[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	3,092	B	3,093	B	3,472	B	3,473	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	5,163	B	5,176	B	7,506	B	7,529	B
Beaver Street West	Chaffee Road - I-295	6,130	B	6,149	B	6,793	B	6,828	B
I-10	US 301 - CSX Railroad	55,216	D	55,235	D	67,490	E	67,525	E
I-10	CSX - I-295	60,962	E	61,047	E	77,564	F	77,720	F
Normandy Boulevard	US 301 - 103rd Street	12,561	D	12,615	D	14,024	E	14,124	F
Normandy Boulevard	103rd Street - Chaffee Road	19,332	C	20,319	C	19,489	C	21,303	C
Normandy Boulevard	Chaffee Road - Herlong Road	18,498	C	19,342	C	24,409	C	25,959	C
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	19,465	D	21,088	D	23,141	C	26,123	C
103rd Street (SR 134)	Old Middleburg Road - I-295	35,545	D	36,458	D	39,656	D	41,333	D
Chaffee Road	Normandy Boulevard - 103rd Street	3,712	C	3,881	C	13,633	C	13,943	C

Key at end of table.

Table 4-43

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 2[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS
Chaffee Road	I-10 - Normandy Boulevard	5,018	C	5,236	C	9,666	C	10,067	D
Chaffee Road	Beaver Street - I-10	12,887	D	12,927	E	14,034	E	14,107	E
Yellow Water Road	Normandy Boulevard - Beaver Street	1,123	C	1,128	C	3,623	C	3,641	C
Otis Road	Nassau County Line - 103rd Street	1,646	C	1,651	C	1,787	C	1,795	C
Old Plank Road	Otis Road - Jones Road	6,973	D	6,974	D	7,462	D	7,465	D
Halsema Road	South of Whitehouse - Beaver Street	2,170	C	2,186	C	2,533	C	2,563	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	4,428	C	4,512	C	5,761	D	5,916	D
Old Middleburg Road	Clay County Line - 103rd Street	14,516	F	14,540	F	15,242	F	15,286	F
Blanding Boulevard (SR 21)	Clay County Line - I-295	102,002	F	102,273	F	108,161	F	108,689	F
Blanding Boulevard	Wells Road - Duval County Line	97,954	F	98,225	F	95,870	F	96,368	F
Wells Road	Blanding Boulevard - DeBarry Avenue	28,945	E	28,967	E	37,651	F	37,692	F

Key at end of table.

Table 4-43

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 2[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	24,606	F	24,628	F	25,396	F	25,437	F
College Drive (SR 224)	Blanding Boulevard - Remington Court	16,839	F	16,843	F	25,784	F	25,792	F
College Drive	Remington Court - Bald Eagle Road	12,446	D	12,450	D	15,934	F	15,942	F
I-295	SR 13 - SR 15	120,081	D	120,160	D	142,806	E	142,951	F
I-295	SR 15 - SR 21	91,172	E	91,303	E	107,559	F	107,800	F
I-295	SR 21 - SR 134	98,589	E	99,167	E	102,607	E	103,669	E
I-295	SR 134 - SR 228	95,666	E	95,748	E	102,865	E	103,015	E
I-295	SR 228 - I-10	100,987	E	101,047	E	109,548	F	109,659	F
I-295	I-10 - SR 15	58,208	D	58,312	D	68,229	F	68,421	F
I-295	SR 15 - SR 104	57,469	D	57,476	D	69,589	F	69,602	F
I-295	SR 15 - SR 115	48,738	D	48,742	D	59,352	D	59,360	D
I-295	SR115 - I-95	51,260	D	51,270	D	62,567	E	62,586	E
Roosevelt Boulevard (US 17)	Clay County Line - SR 134	53,476	F	53,500	F	61,974	F	62,017	F
US 301 S	Clay County Line - SR 228	21,999	B	22,068	B	25,989	C	26,115	C

Key at end of table.

Table 4-43

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 2[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volume Including Volume Generated From Proposed Base Redevelopment	LOS
US 301 S	SR 228 - I-10	19,531	B	19,552	B	23,523	B	23,561	B
US 301 S	I-10 - US 90	10,065	B	10,076	B	12,281	B	12,301	B
N US 301	US90 - N. Baldwin City Limits	6,133	B	6,143	B	6,407	B	6,425	B
N US 301	N. Baldwin City Limits - Nassau County Line	4,021	B	4,030	B	4,564	B	4,580	B
US 17	Clay County Line - Wells Road	92,187	F	92,215	F	102,177	F	102,228	F
US 17	Wells Road - SR 224	59,125	F	59,132	F	78,997	F	79,010	F
US 17 Bridge	Doctors Inlet Bridge	48,883	F	48,980	F	63,302	F	63,315	F

a Shaded rows indicate road segments that would experience a deterioration in LOS as a result of redevelopment of NAS Cecil Field.

b Future projections of regional traffic growth conducted by the Jacksonville MPO, assuming closure of NAS Cecil Field with no redevelopment activity.

Key:

ARS = Alternative Reuse Scenario.
LOS = Level of service.
SR = State Road.

Source: Jacksonville MPO 1996.

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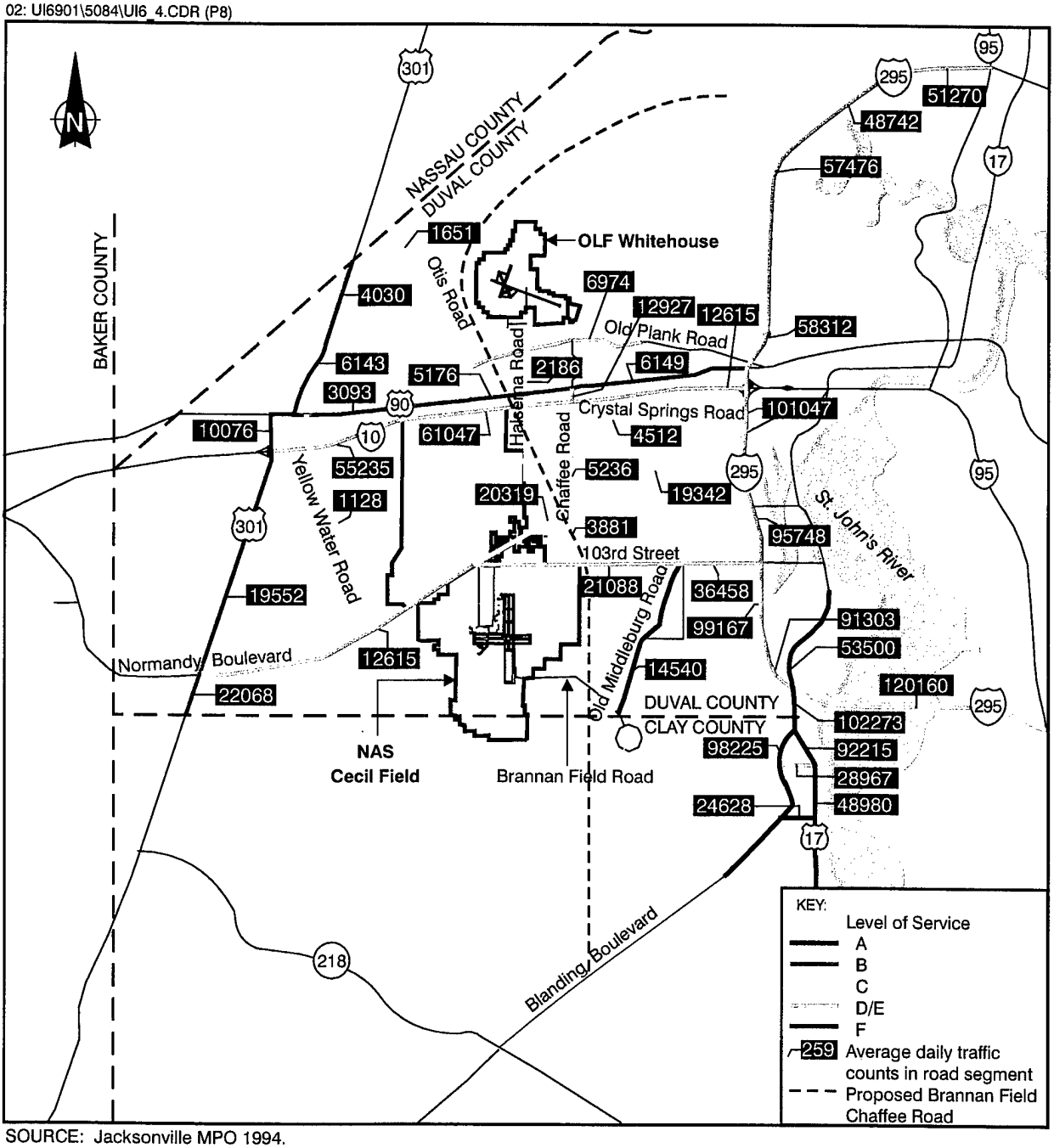

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-17 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 2, PHASE 1

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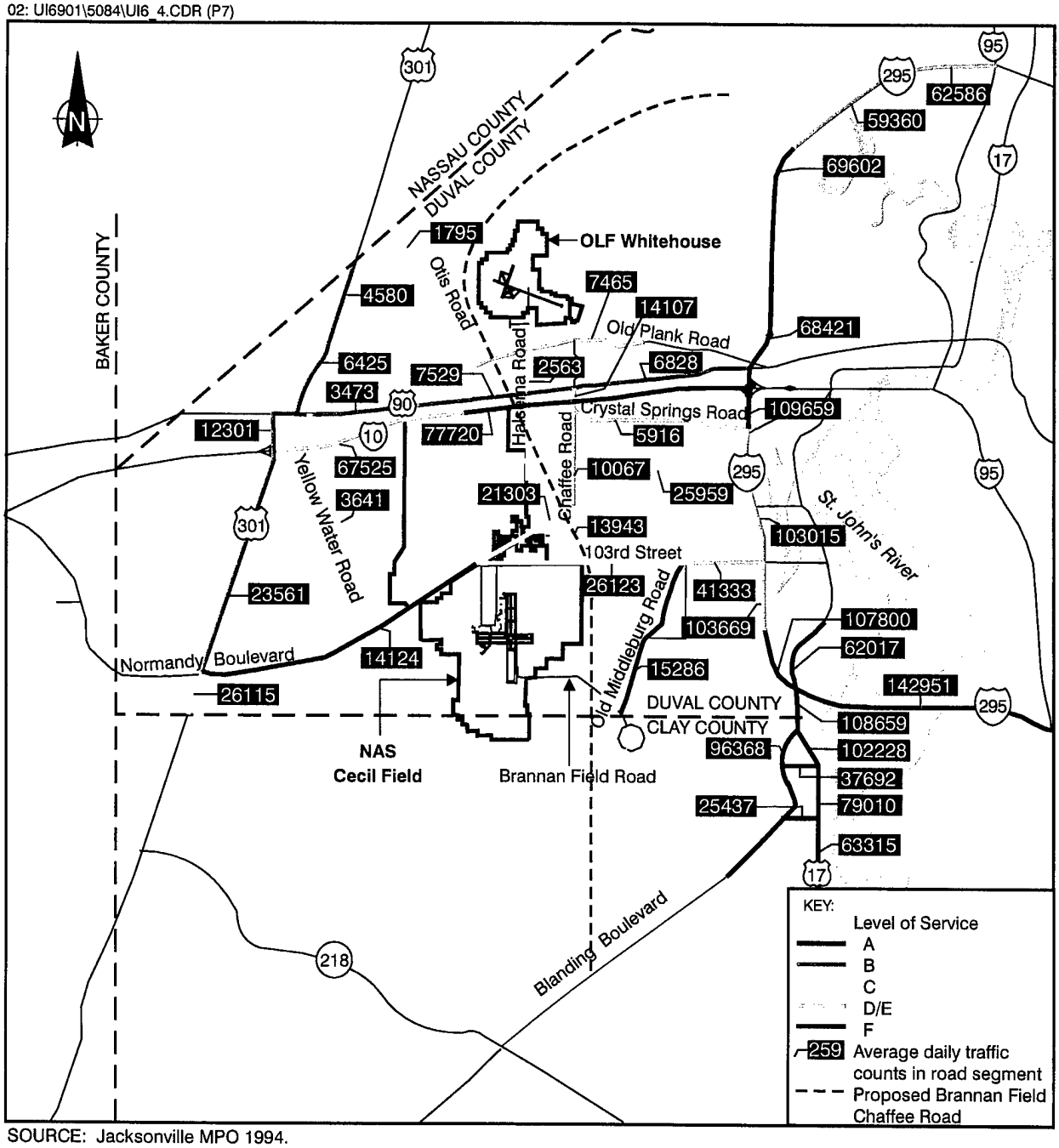

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-18 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 2, PHASE 2

4.8.4 Alternative Reuse Scenario 3

Roadway Network

ARS 3 would produce the greatest amount of traffic from new land uses among the alternatives. At full buildout of Phase 1 development, approximately 11,697 average daily trips are projected to be generated, while 1,287 peak-hour trips are projected. Implementation of Phase 2 development is estimated to generate a total of 48,398 average daily trips and 5,110 peak-hour trips. Phase 2 development would include land uses that are major trip generators such as commercial and residential uses. Table 4-44 displays trips generated by proposed land uses in ARS 3.

Of the scenarios evaluated, increase in traffic volume and deterioration in LOS is most significant in ARS 3. Full buildout of Phase 2 development would result in significant traffic loadings associated with residential and commercial activities. Table 4-45 displays the MPO's projected traffic volumes, traffic volumes resulting from redevelopment and the associated LOSs. Figures 4-19 and 4-20 display the traffic conditions resulting from Phases 1 and 2 of ARS 3.

Although the LOS is projected to deteriorate on many roadways, especially those related to Phase 2 development, mitigation opportunities would be available. The integration of new roadway construction (i.e., Brannan Field-Chaffee Road) and improvements to existing roadways would increase roadway capacities. Additionally, implementation of transportation demand/supply management techniques, such as ridesharing incentives, parking fees, and flexible work shifts, offer alternative congestion management techniques.

Mass Transit

Mass transit service to the southwestern extent of the Jacksonville service area may initially be canceled due to a lack of sufficient ridership to support service during the initial phases of redevelopment. Due to the development of major trip destinations in the second phase of this alternative, transit service may eventually be determined to be feasible. Transportation demand/supply management programs, such as flexible work schedules, ridesharing incentives, parking fees, and reduced parking space availability, may promote the use of alternative transportation modes, while reducing traffic volumes generated from reuse.

Table 4-44

TRIP GENERATION FOR ARS 3

Land Use	Impact	Total Trips/Day	Total Trips/ Peak Hour
Phase 1: 1998-2004			
Residential	750 units	6,602	661
Light Industrial	400 employees	2,792	248
Business Park	250,000 sf	2,003	242
Manufacturing	200,000 sf	300	136
Total Trips		11,697	1,287
Phase II : 2004-2010			
Commercial	200,000 sf	10,900	1,020
Residential	2,500 units	20,009	1,937
Light Industrial	400 employees	2,792	248
Business Park	300,000 sf	2,250	278
Manufacturing	500,000 sf	750	340
Total Trips		48,398	5,110

Key:

ARS = Alternative Reuse Scenario.
sf = Square feet.

Table 4-45

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 3[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	3,092	B	3,094	B	3,472	B	3,479	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	5,163	B	5,199	B	7,506	B	7,656	B
Beaver Street West	Chaffee Road - I-295	6,130	B	6,184	B	6,793	B	7,018	B
I-10	US 301 - CSX Railroad	55,216	D	55,271	D	67,490	E	67,717	E
I-10	CSX - I-295	60,962	E	61,208	E	77,564	F	78,580	F
Normandy Boulevard	US 301 - 103rd Street	12,561	D	12,717	D	14,024	E	14,671	F
Normandy Boulevard	103rd Street - Chaffee Road	19,332	C	22,181	D	19,489	C	31,279	D
Normandy Boulevard	Chaffee Road - Herlong Road	18,498	C	20,933	C	24,409	C	34,482	D
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	19,465	D	24,149	D	23,141	D	42,523	F
103rd Street (SR 134)	Old Middleburg Road - I-295	35,545	D	38,179	D	39,656	D	50,555	E
Chaffee Road	Normandy Boulevard - 103rd Street	3,712	C	4,199	C	13,633	C	15,649	C
Chaffee Road	I-10 - Normandy Boulevard	5,018	C	5,649	C	9,666	C	12,275	D

Key at end of table.

Table 4-45

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 3[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Chaffee Road	Beaver Street - I-10	12,887	D	13,002	E	14,034	E	14,510	F
Yellow Water Road	Normandy Boulevard - Beaver Street	1,123	C	1,137	C	3,623	C	3,690	C
Otis Road	Nassau County Line - 103rd Street	1,646	C	1,659	C	1,787	C	1,842	C
Old Plank Road	Otis Road - Jones Road	6,973	D	6,977	D	7,462	D	7,479	D
Halsema Road	South of Whitehouse - Beaver Street	2,170	C	2,217	C	2,533	C	2,726	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	4,428	C	4,671	C	5,761	D	6,767	D
Old Middleburg Road	Clay County Line - 103rd Street	14,516	F	14,585	F	15,242	F	15,529	F
Blanding Boulevard (SR 21)	Clay County Line - I-295	102,002	F	102,784	F	108,161	F	111,396	F
Blanding Boulevard	Wells Road - Duval County Line	97,954	F	98,736	F	95,870	F	99,105	F
Wells Road	Blanding Boulevard - DeBarry Avenue	28,945	E	29,009	E	37,651	F	37,918	F
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	24,606	F	24,670	F	25,396	F	25,663	F
College Drive (SR 224)	Blanding Boulevard - Remington Court	16,839	F	16,852	F	25,784	F	25,837	F

Key at end of table.

Table 4-45

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 3[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
College Drive	Remington Court - Bald Eagle Road	12,446	D	12,459	D	15,934	F	15,987	F
I-295	SR 13 - SR 15	120,081	D	120,309	D	142,806	E	143,751	F
I-295	SR 15 - SR 21	91,172	E	91,551	E	107,559	F	109,127	F
I-295	SR 21 - SR 134	98,589	E	100,257	E	102,607	E	109,510	F
I-295	SR 134 - SR 228	95,666	E	95,901	E	102,865	E	103,838	E
I-295	SR 228 - I-10	100,987	E	101,162	E	109,548	F	110,270	F
I-295	I-10 - SR 15	58,208	D	58,510	D	68,229	F	69,477	F
I-295	SR 15 - SR 104	57,469	D	57,490	D	69,589	F	69,675	F
I-295	SR 15 - SR 115	48,738	D	48,751	D	59,352	D	59,406	D
I-295	SR115 - I-95	51,260	D	57,290	D	62,567	E	62,692	E
Roosevelt Boulevard (US17)	Clay County Line - SR 134	53,476	F	53,544	F	61,974	F	62,256	F
US 301 S	Clay County Line - SR 228	21,999	B	22,197	B	25,989	C	26,808	C
US 301 S	SR 228 - I-10	19,531	B	19,591	B	23,523	B	23,771	B
US 301 S	I-10 - US90	10,065	B	10,097	B	12,281	B	14,412	B
N US 301	US 90 - N. Baldwin City Limits	6,133	B	6,161	B	6,407	B	6,524	B

Key at end of table.

Table 4-45

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 3[a]

Road Name	Segment	Phase 1 (1998-2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Proposed Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
N US 301	N. Baldwin City Limits - Nassau County Line	4,021	B	4,046	B	4,564	B	4,669	B
US 17	Clay County Line - Wells Road	92,187	F	92,267	F	102,177	F	102,509	F
US 17	Wells Road - SR 224	59,125	F	59,146	F	78,997	F	79,085	F
US 17 Bridge	Doctors Inlet Bridge	48,883	F	48,904	F	63,302	F	63,390	F

[a] Shaded rows indicate road segments that would experience a deterioration in LOS as a result of redevelopment of NAS Cecil Field.
[b] Future projections of regional traffic growth conducted by the Jacksonville MPO, assuming closure of NAS Cecil Field with no redevelopment activity.

Key:

ARS = Alternative Reuse Scenario.
LOS = Level of Service.
NA = Not applicable.

Source: Jacksonville MPO 1996.

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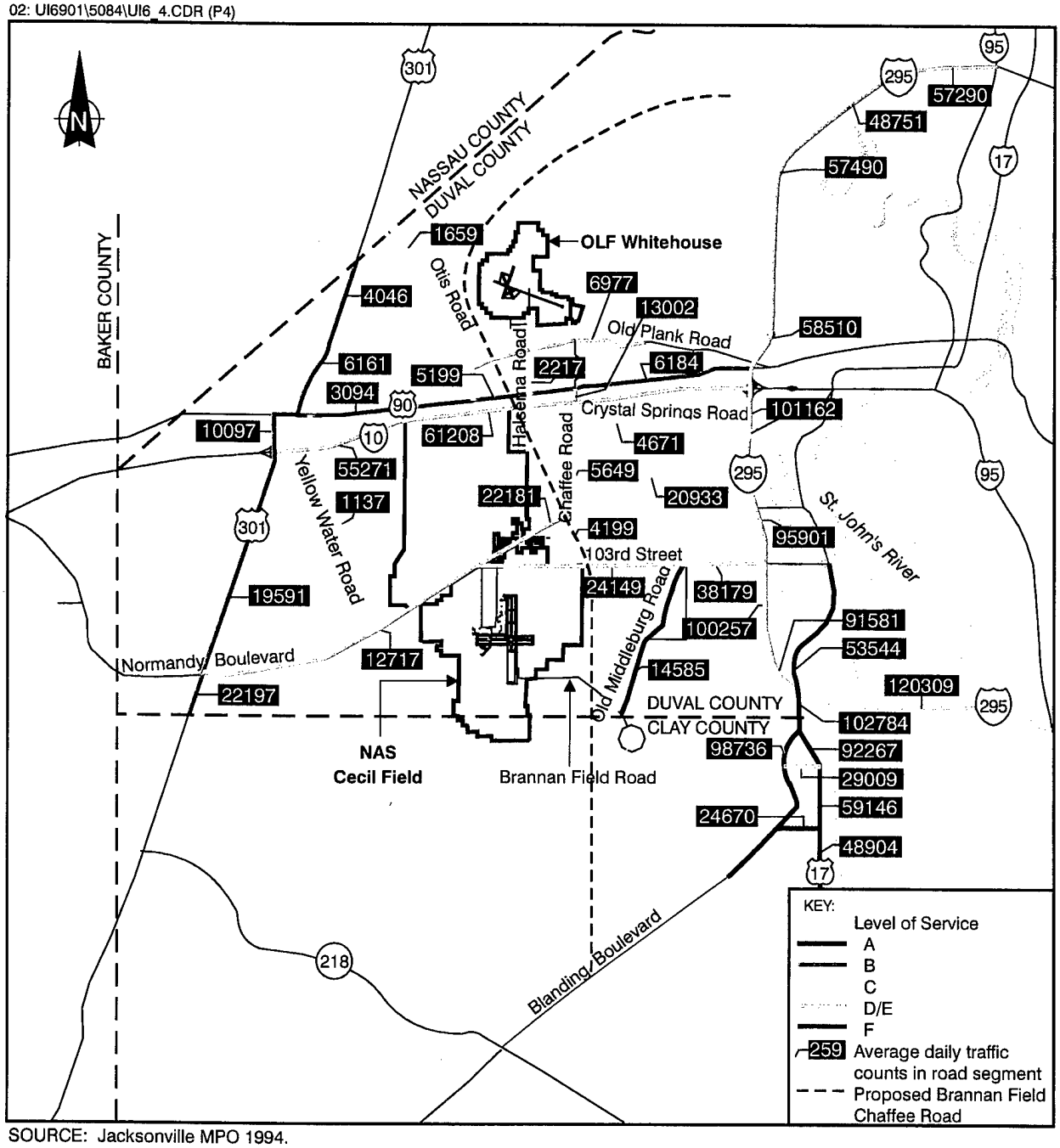

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-19 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 3, PHASE 1

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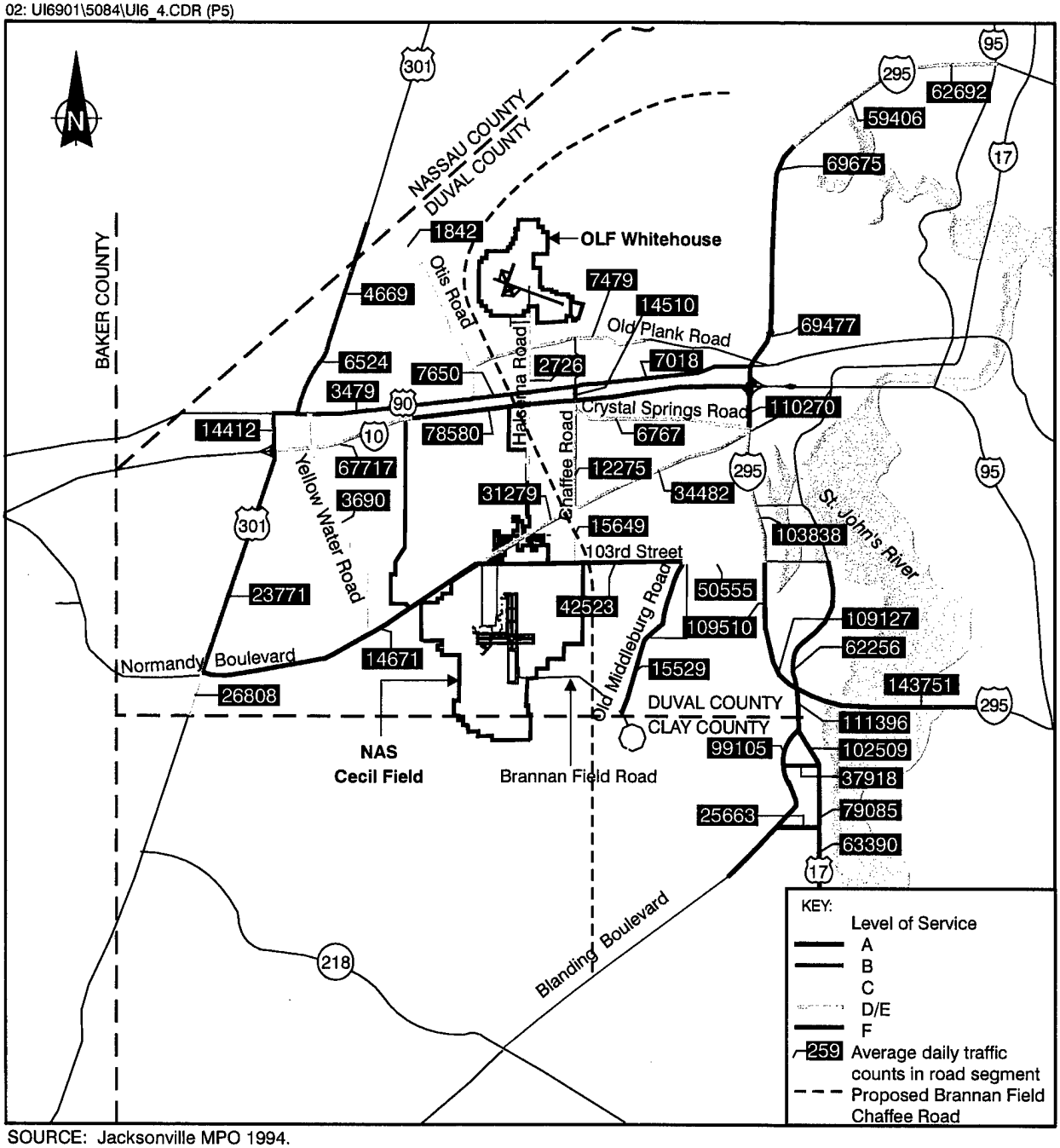


SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-20 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 3, PHASE 2

Rail Facilities

No rail service is currently planned for this alternative, but freight service may become feasible as development proceeds. A planned transportation corridor is identified in this reuse scenario to utilize the existing rail right-of-way. If this or another right-of-way is secured, it may be utilized to provide rail as well as vehicular access to the land uses on the northern portion of the base. Should the installation of rail facilities prove feasible, it would provide access to the CSX line to the north, and it would provide alternative options for raw material deliveries and shipment of finished products.

Airport Facilities

No airport facilities are proposed for this reuse scenario.

4.8.5 Alternative Reuse Scenario 4

Roadway Network

Traffic generated from the new land uses proposed in ARS 4 would produce approximately 13,029 average daily trips by the end of Phase 1, with 2,500 peak-hour trips projected. Implementation of Phase 2 development is estimated to generate a total of 27,268 average daily trips and 4,178 peak-hour trips. Table 4-46 displays the projected number of trips generated under ARS 4.

Roadways within the region influenced by ARS 4 would experience an increase in traffic volumes over the MPO's projected traffic levels. In most cases, ARS 4 would not result in a significant modification of LOS. Table 4-47 displays the MPO's projected traffic volumes, traffic volumes resulting from redevelopment, and the associated LOSs. Figures 4-21 and 4-22 display the traffic conditions resulting from Phases 1 and 2 of the ARS 4.

LOS is projected to deteriorate, especially related to Phase 2 development, along portions of Normandy Boulevard, 103rd Street, and Chaffee Road.

Mass Transit

Mass transit service to this area may be canceled due to a lack of sufficient density, the relative seclusion of the property would potentially result in a subsequent lack of ridership to support service in the initial period of redevelopment. Transportation demand/supply management programs, such as flexible work schedules, carpooling incentives, parking fees, and reduced parking space availability, may promote the use of alternative transportation modes, while serving as a mitigation for traffic volumes generated from reuse.

Table 4-46

TRIP GENERATION FOR ARS 4

Land Use	Impact	Total Trips/Day	Total Trips/ Peak Hour
Phase 1: 1998-2004			
State Department of Corrections	1,950 employees	3,666	1,326
Juvenile Justice	100 employees	188	68
Warehouse/Distribution	1,000,000 sf	2,792	248
Business Park	250,000 sf	2,003	242
Heavy Industrial	250,000 sf	375	170
Aviation/Aviation Services	440,000 sf	4,005	446
Total Trips		13,029	2,500
Phase 2: 2005-2010			
Commercial	100,000 sf	5,450	510
Aviation/Aviation Services	550,000 sf	1,601	178
Light Industrial	1,500,000 sf	4,188	372
Business Park	300,000 sf	2,250	278
Heavy Industrial	500,000 sf	750	340
Total Trips		27,268	4,178

Key:

ARS = Alternative Reuse Scenario.
sf = Square feet.

Table 4-47

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 4[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Proposed Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Beaver Street West (SR 10)	US 301 - SR 199 (Otis Road)	3,092	B	3,094	B	3,472	B	3,476	B
Beaver Street (SR 10)	SR 199 (Otis Road) - Chaffee Road	5,163	B	5,201	B	7,506	B	7,588	B
Beaver Street West	Chaffee Road - I-295	6,130	B	6,187	B	6,793	B	6,916	B
I-10	US 301 - CSX Railroad	55,216	D	55,273	D	67,490	E	67,614	E
I-10	CSX - I-295	60,962	E	61,219	E	77,564	F	78,120	F
Normandy Boulevard	US 301 - 103rd Street	12,561	D	12,725	D	14,024	E	14,378	F
Normandy Boulevard	103rd Street - Chaffee Road	19,332	C	22,315	D	19,489	C	25,940	D
Normandy Boulevard	Chaffee Road - Herlong Road	18,498	C	21,046	C	24,409	C	29,921	C
103rd Street (SR 134)	Normandy Boulevard - Old Middleburg Road	19,465	D	24,368	D	23,141	D	33,746	F
103rd Street (SR 134)	Old Middleburg Road - I-295	35,545	D	38,302	D	39,656	D	45,620	E
Chaffee Road	Normandy Boulevard - 103rd Street	3,712	C	4,222	C	13,633	C	14,736	C
Chaffee Road	I-10 - Normandy Boulevard	5,018	C	5,678	C	9,666	C	11,094	D

Key at end of table.

Table 4-47

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 4[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Proposed Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
Chaffee Road	Beaver Street - I-10	12,887	D	13,008	D	14,034	E	14,295	F
Yellow Water Road	Normandy Boulevard - Beaver Street	1,123	C	1,138	C	3,623	C	3,664	C
Otis Road	Nassau County Line - 103rd Street	1,646	C	1,660	C	1,787	C	1,817	C
Old Plank Road	Otis Road - Jones Road	6,973	D	6,977	D	7,462	D	7,471	D
Halsema Road	South of Whitehouse - Beaver Street	2,170	C	2,219	C	2,533	C	2,638	C
Crystal Springs Road	Chaffee Road - Lenox Avenue	4,428	C	4,683	C	5,761	D	6,312	D
Old Middleburg Road	Clay County Line - 103rd Street	14,516	F	14,588	F	15,308	F	15,399	F
Blanding Boulevard (SR 21)	Clay County Line - I-295	102,002	F	102,820	F	108,161	F	109,931	F
Blanding Boulevard	Wells Road - Duval County Line	97,954	F	98,772	F	95,870	F	97,640	F
Wells Road	Blanding Boulevard - DeBarry Avenue	28,945	E	29,012	D	37,651	F	37,797	F
Kingsley Avenue (SR 224)	Blanding Boulevard - DeBarry Avenue	24,606	F	24,673	D	25,396	F	25,542	F

Key at end of table.

Table 4-47

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 4[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Proposed Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
College Drive (SR 224)	Blanding Boulevard - Remington Court	16,839	F	16,852	F	25,784	F	25,813	F
College Drive	Remington Court - Bald Eagle Road	12,446	D	12,459	D	15,934	F	15,963	F
I-295	SR 13 - SR 15	120,081	D	120,320	D	142,806	E	143,323	F
I-295	SR 15 - SR 21	91,172	E	91,569	E	107,559	F	108,417	F
I-295	SR 21 - SR 134	98,589	E	100,335	E	102,607	E	106,384	E
I-295	SR 134 - SR 228	95,666	E	95,912	E	102,865	E	103,398	E
I-295	SR 228 - I-10	100,987	E	101,170	E	109,548	F	109,943	F
I-295	I-10 - SR 15	58,208	D	58,524	D	68,229	F	68,912	F
I-295	SR 15 - SR 104	57,469	D	57,491	D	69,589	F	69,636	F
I-295	SR 15 - SR 115	48,738	D	48,752	D	59,352	D	59,381	D
I-295	SR115 - I-95	51,260	D	51,292	D	62,567	E	62,635	E
Roosevelt Boulevard (US 17)	Clay County Line - SR 134	53,476	F	53,547	F	61,974	F	62,128	F
US 301 S	Clay County Line - SR 228	21,999	B	22,206	B	25,989	C	26,437	C
US 301 S	SR 228 - I-10	19,531	B	19,594	B	23,523	B	23,659	B
US 301 S	I-10 - US 90	10,065	B	10,098	B	12,281	B	12,353	B

Key at end of table.

Table 4-47

PROJECTED LEVELS OF SERVICE AND TRAFFIC VOLUMES FOR ARS 4[a]

Road Name	Segment	Phase 1 (1998 - 2004)				Phase 2 (2005 - 2010)			
		Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Proposed Volume Generated From Proposed Base Redevelopment	LOS	Projected Average Daily Traffic Volumes Without Base Redevelopment[b]	LOS	Average Daily Traffic Volumes Including Volume Generated From Proposed Base Redevelopment	LOS
N US 301	US 90 - N. Baldwin City Limits	6,133	B	6,163	B	6,407	B	6,471	B
N US 301	N. Baldwin City Limits - Nassau County Line	4,021	B	4,048	B	4,564	B	4,621	B
US 17	Clay County Line - Wells Road	92,187	F	92,271	F	102,177	F	102,359	F
US 17	Wells Road - SR 224	59,125	F	59,147	F	78,997	F	79,045	F
US 17 Bridge	Doctors Inlet Bridge	48,883	F	48,905	F	63,302	F	63,350	F

a Shaded rows indicate road segments that would experience a deterioration in LOS as a result of redevelopment of NAS Cecil Field.

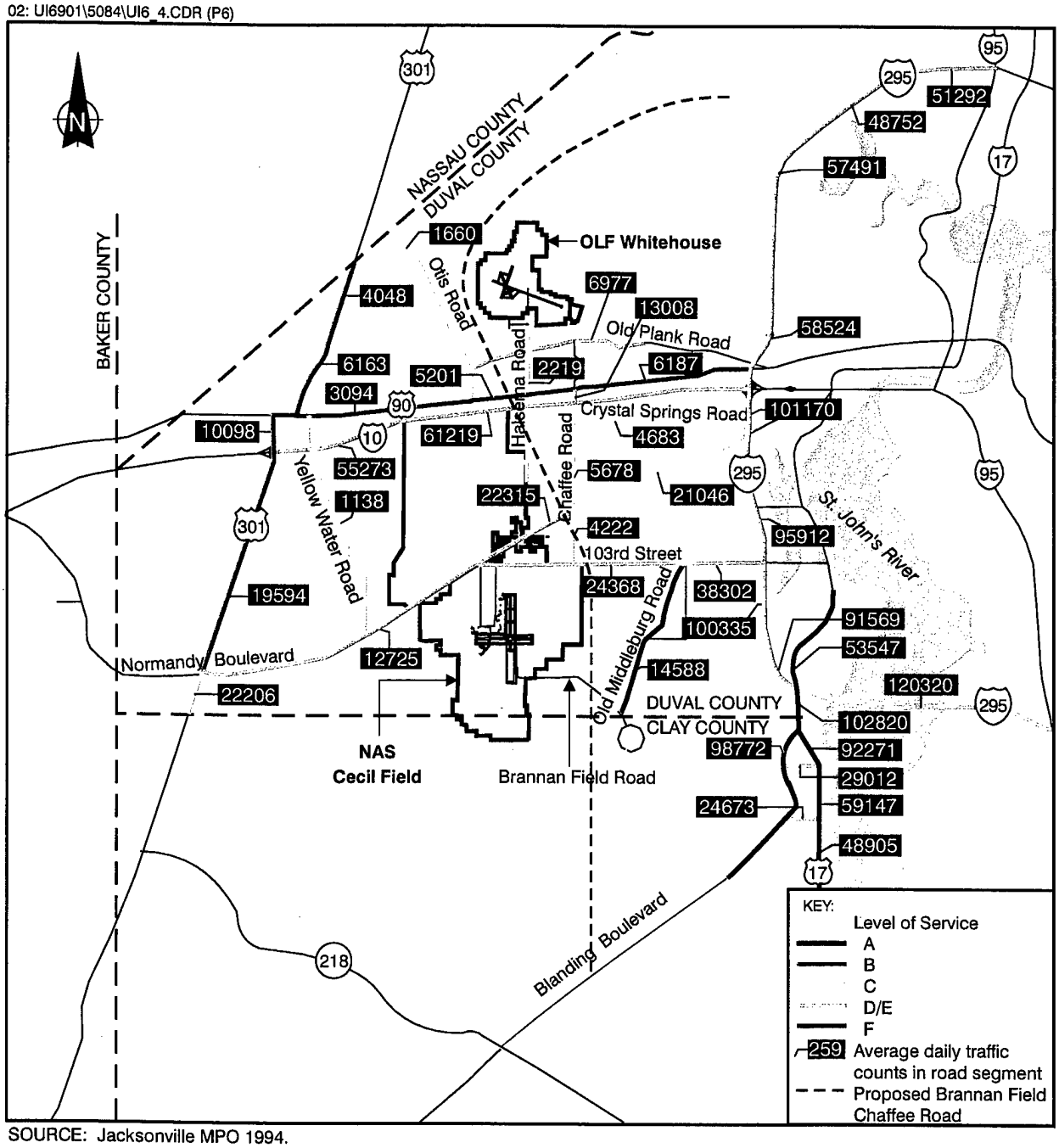
b Future projections of regional traffic growth conducted by the Jacksonville MPO, assuming closure of NAS Cecil Field with no redevelopment activity.

Key:

ARS = Alternative Reuse Scenario.
LOS = Level of Service.
SR = State Road.

Source: Jacksonville MPO 1996.

02: UI6901\5084\UI6_4.CDR (P6)



SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-21 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 4, PHASE 1

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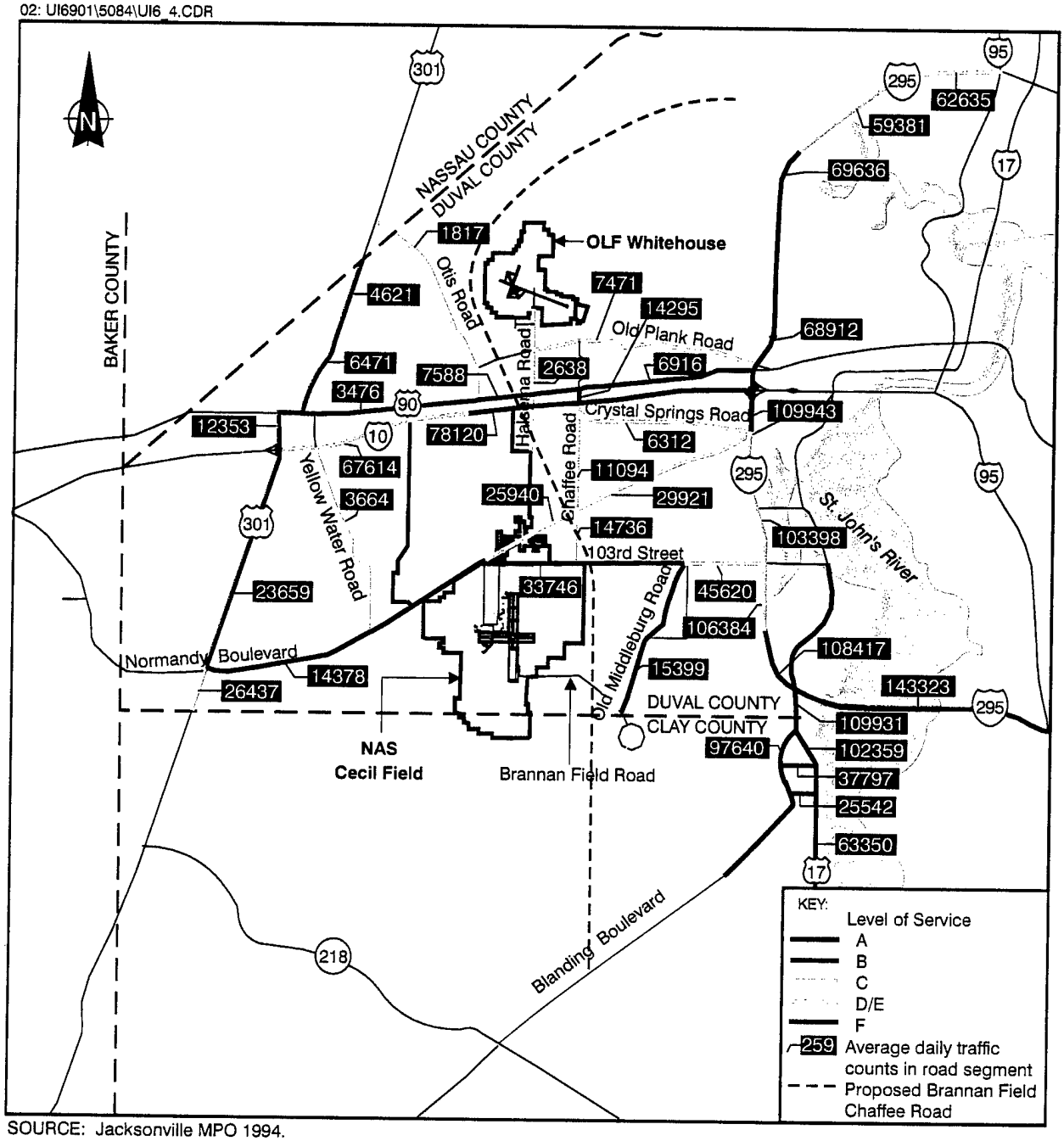

SOURCE: Jacksonville MPO 1994.

SCALE
0 18,500 37,000 Feet

Figure 4-22 TRAFFIC CONDITIONS IN ROAD SEGMENTS IN THE VICINITY OF NAS CECIL FIELD ARS 4, PHASE 2

Rail Facilities

No rail service is currently planned for this alternative, but freight service may become feasible as development occurs. A planned transportation corridor is identified in this reuse scenario to utilize the existing rail right-of-way. If this or another right-of-way is secured, it could be utilized to provide rail as well as vehicular access to the land uses on the northern portion of the base. Should the installation of rail facilities prove feasible, it would provide businesses on the property access to the CSX line to the north, and would provide alternative options for raw material deliveries and shipment of finished products.

Airport Facilities

Similar to the Preferred Reuse Plan, ARS 4 proposes reuse of existing runways at the station. This reuse would provide for general aviation activities to utilize existing aviation-related infrastructure. Projected volume and types of air traffic generated from this alternative are presented in Table 4-39.

The station is being incorporated into the overall Florida Aviation System Plan. As was noted previously, the FAA will need to develop an airport management plan coordinating airspace utilization, safety and air traffic control requirements. Therefore, no significant impacts to air facilities would occur.

4.8.6 Cumulative Impacts

Roadway Network

Reasonably foreseeable traffic growth is included in the Jacksonville MPO's regional projections. As such, the analysis presented provides a cumulative assessment of traffic impacts. No other major projects would occur in the foreseeable future that could further affect regional traffic volumes.

Mass Transit

There are no reasonably foreseeable actions that would result in cumulative effects to mass transit services when added to the impacts associated with the Preferred Reuse Plan.

Rail Facilities

There are no reasonably foreseeable actions that would result in cumulative impacts to rail facilities.

Airport Facilities

Cumulatively, airport operations would decrease in the region after the closure of NAS Cecil Field and reuse under the Preferred Reuse Plan. No significant adverse impacts would occur that could not be addressed by the FAA's plan to incorporate the facility into the Florida Aviation System Plan.

4.8.7 Mitigation Measures

In general, high-traffic volumes and deficient LOSs are currently experienced on roadways in the southeast portion of Cecil Field's region of influence. This unsatisfactory situation is partially a result of increased residential development activity in northeastern Clay County and inadequate capacity to accommodate the increased number of home-to-work trips from these residences to jobs within the City of Jacksonville. Implementation of the Preferred Reuse Plan would slightly increase traffic along road segments in this area.

To mitigate projected traffic problems in this area, FDOT plans to develop a new road in its regional transportation plan. This roadway, named Brannan Field-Chaffee Road, is proposed to add a four-lane divided arterial segment between I-10 and Blanding Boulevard, in Clay County (Jacksonville MPO 1994). This roadway segment would add capacity for approximately 17,600 vehicles per average daily volume (assuming an LOS C on the roadway) (FDOT 1995) to the regional system and would integrate an additional route choice alternative to redirect volumes from the more congested components of the existing system (e.g., Blanding Boulevard, U.S. 17, etc.). Construction of this facility has been approved and is listed in the city's Transportation Improvement Plan (see Table 3-22). Funding for right-of-way acquisition has been allocated, but funding for construction has yet to be allocated (Burney 1996).

Because traffic increases will occur gradually as redevelopment projects are completed, individual developers will be responsible for assessing potential traffic effects of new projects as part of the local review and approval process. Depending on the level of impact anticipated, mitigation could be in the form of off-site geometric improvements to roads to support greater volumes or implementation of transportation demand management techniques, such as staggered work hours to minimize commuting impacts.

4.9 Infrastructure and Utilities

The following section provides a discussion of projected impacts to utility services including water supply, wastewater system, storm water management, electric power

distribution, steam generation and distribution, jet fuel facilities, compressed air, and solid waste as a result of the proposed action.

4.9.1 Preferred Reuse Plan

Water and Sewer

In the short term, the impact to the existing water and sewer infrastructure systems would not be significant. The current systems are adequate for serving users of station property in the first phase of redevelopment. However, the long-term implementation of the Preferred Reuse Plan would necessitate significant changes to the existing water and sewer systems. The most notable improvements would be required at the Yellow Water Area to serve new industrial uses.

The permitted withdrawal on the Main Station rate is 2.4 mgd, and the maximum production capacity is 8.2 mgd, with an average withdrawal of 0.612 mgd. At 12-year-buildout, approximately 1,400 workers would be employed at the Main Station. Assuming a daily water usage of 98 gallons per person per day for light industrial activities and 142 gallons per person per day for heavy industrial uses (U.S. Bureau of Census 1986), water demand at the Main Station would be 0.197 mgd. At the Yellow Water Area, the permitted withdrawal rate from water production wells is 0.270 mgd and maximum production capacity is 2.5 mgd, with 0.105 mgd average withdrawal. At 12-year-buildout, approximately 1,799 workers would be expected. Assuming a daily water usage of 47 gallons per day for commercial use, and 120 gallons per day for light/heavy industrial workers (Boland 1985), the water demand by workers would be 0.202 mgd. Therefore, the total net water usage under the Preferred Reuse Plan is expected to be 0.399 mgd. With a total permitted withdrawal rate under the existing Water Consumption Use Permits of 2.67 mgd, the overall excess capacity is 2.27 mgd.

Although the production wells have sufficient capacity to serve the redevelopment of Cecil Field, the long-term objective is to connect to the city's water distribution system while utilizing Cecil Field's existing distribution system (Lund 1996). Several notable issues of concern are posed by the existing system. The water lines are approximately 40-years old and of unknown condition. The integrity of the 40-year-old ductile iron well casing is questionable and may be vulnerable to contaminants. Fuel tanks that serve the pumps at the well need to be replaced. The water system has inadequate flows and pressures for fire fighting, primarily because of undersized 6-inch mains. According to the construction drawings, the water main at the Yellow Water Area is asbestos cement (CFDC 1996).

The Navy operates an independent WWTP to all sewage generated at the Main Station and the Yellow Water Area. The plant has a Class B operator's license with wastewater discharge permits issued by EPA (NPDES) and FDEP/Jacksonville. The WWTP has a capacity to treat 1.2 mgd of wastewater. Assuming the wastewater generated by the workers equals 80% of the water consumed (ICMA 1988), under the Preferred Reuse Plan, approximately 0.319 mgd of waste water would be generated. Therefore, a surplus wastewater treatment capacity of 0.881 mgd exists.

Although the sewer infrastructure is in good condition, functions adequately, and the WWTP is projected to have surplus capacity, the long-term objectives of the Preferred Reuse Plan would require significant improvements and ultimate connection to the city's system. Improvements would include extensions and expansions to new service areas and general upgrades and modifications for regulatory compliance. For example, a significant expansion to the force main system would be required at the Yellow Water Area to service land areas proposed for industrial development. Projected activities in the area would generate approximately 0.161 mgd at the 12-year-buildout under the Preferred Reuse Plan.

As part of the compliance schedule under the temporary WWTP operating permit, discharge into Rowell Creek during times of low flow and high temperature would be eliminated. However, the problem still exists because a $1.2 million corrective project was canceled by the Navy as a result of the pending station closure. Although the temporary operating permit expires in 1996, it is expected that the temporary operating permit will be extended during the interim period despite noncompliance (Lund 1996). Other concerns that need to be addressed include the condition of the wastewater collection system. Most of the conveyance system is composed of 40-year-old piping (condition unknown), and infiltration/inflow problems occur during heavy rains.

Responsibility for water and sewage distribution and treatment at the former NAS Cecil Field will be assumed by the JDPU in late 1998 (Lund 1996). The continuous operation and/or phase-out of existing water and sewer systems would depend on the timing and needs of future development activities. In the short term, the existing water and sewer systems would be adequate to support the initial phase of redevelopment; however, long-term objectives may require revamping of the entire systems.

JDPU plans to use NAS Cecil Field's existing water distribution system and certain water production wells and water treatment facilities. Continued use of the existing system is expected to occur even after NAS Cecil Field's water distribution system is connected into the municipal system. However, depending on future demand on and off station, JDPU may

cease operation of the existing water production and/or treatment facilities in lieu of a more regional production and treatment facility (Lund 1996).

JDPU intends to utilize the existing WWTP until Cecil Field's waste water conveyance system can be connected with the JDPU sewer system. Although JDPU has a 16-inch sanitary sewer force main that terminates at the Bent Creek Subdivision just east of NAS Cecil Field, use of the force main is not expected because of conveyance capacity problems with the system. However, JDPU proposes to tie into Cecil Field's existing distribution system through a pumping station to be installed at the WWTP. The pump station sewage would be transported through a 16-inch or 20-inch line to a repump station near Shindler Road. From the repump station, sewage would be transported through a 24-inch line, which would connect into the city's system, and eventually be discharged into JDPU's District 3 WWTP. The plant has a present excess capacity of 3.5 mgd. JDPU expects to phase-out the use of the existing WWTP at NAS Cecil Field. The timing of phase-out would depend on future development demands, operating permits, and regulatory compliance (Lund 1996).

Under the *Jacksonville 2010 Comprehensive Plan,* water and sewer concurrency requirements are based on available capacity at the treatment facility. Currently, all of the city's water treatment and sewage treatment plants have available capacity (Hunt 1996).

Storm water

In the short term, the storm water drainage system would not be significantly affected; however, over the long term, site-wide and site-specific conveyance systems and retention/detention facilities would have to be designed and installed. Currently, storm water runoff that does not permeate through soil or drain into wetlands is directed into a well-developed system of open drainage swales. The open drainage swales serve as the primary method for controlling storm water runoff at the Main Station and at the Yellow Water Area. The air operations area is served by a system of large, deep storm water drain pipes that convey runoff under the runways to open ditches.

The current system of open drainage swales provides storm water conveyance for over 2.9 million square feet of building space. Approximately 82,000 square feet of this building space is at the Yellow Water Area. Under the Preferred Reuse Plan, final buildout is expected to occupy approximately 5 million square feet. Most new development (impervious surface) is planned for the Yellow Water Area. Currently, the Yellow Water Area has only 3% of the developed floor area (or approximately 82,000 square feet) at Cecil Field. This new development would require significant improvement of the station's drainage systems, particularly in the Yellow Water Area.

The Yellow Water Area has three natural drainage outlets: Yellow Water Creek, Brady Branch to St. Mary's River, and under Normandy Boulevard to Rowell Creek. Although the Preferred Reuse Plan seeks to minimize disturbance and loss of the forested areas through site location, allocation of natural preservation areas, and low FAR, the conversion of vegetative cover type from permeable to impermeable surfaces would lead to topographic disturbances and an increase in the magnitude of storm water runoff requiring conveyance and treatment.

Following station closure, storm water management would be subject to federal, state, and local regulations, and permit requirements. The ultimate receiving entity or individual developers would be responsible for installation of adequate drainage facilities. With few exceptions, the treatment of storm water runoff is required for all development, redevelopment and existing developed areas when expansion occurs. FDEP has adopted Storm water Rules (Chapter 17-25, Florida Administrative Code [FAC]) to fulfill the state's responsibilities under Section 208 of the Federal Water Pollution Control Act. The objective of the rules is to reduce discharge pollutants by requiring treatment for the first inch of runoff for sites less than 100 acres, or first one-half inch of runoff for sites 100 acres or greater. This is usually accomplished through storm water retention or detention with filtration. The requirements of Chapter 17-25 were delegated to the local water management district (i.e., St. Johns River Water Management District (SJRWMD) and are implemented locally under Rule 40C-42.

The SJRWMD has three rules that address storm water (40C-4, 40C-40, and 40C-42). Rules 40C-4 and 40C-40 address the management and storage of surface waters and peak rates of discharge including issues such as wetland storm water discharge, storm water discharge facilities, closed conduits, and open channels. The third rule (40C-42) requires storm water treatment systems to provide a level of treatment which meets the particular requirements of Section 40C-42.025 FAC, and ensures that the water quality in receiving bodies is not degraded below the minimum conditions necessary to maintain their classification as established in Chapter 17-302 FAC.

Furthermore, at the local level, the City of Jacksonville has adopted storm water management regulations as part of their land development code, Chapter 654 of the City Ordinance Code. The land development procedures require that new developments do not adversely impact adjacent lands or the receiving drainage system. If the existing drainage system does not have the capacity to accept increased runoff from the new development, on-site detention may be required. In addition, storm water runoff (i.e., drainage) is subjected to a level of service standard for concurrency compliance.

Concurrency compliance requirements for sites 40 acres or larger use the soil conservation service (SCS) methodology to determine the amount of rainfall runoff for a 25-year storm. The SCS or rational method may be used to calculate rainfall runoff for sites from 10 to 40 acres for the 25-year storm. For sites smaller than 10 acres, the rational method must be used to calculate runoff for the 100-year storm. In all cases, modeling must be performed for the pre-development and post-development land use activity. Based on these calculations, the amount of required on-site detention is equal to the difference between the pre-development and post-development runoff (Brown 1996).

Natural Gas

No short-term impacts are expected to occur to the natural gas distribution system. However, the long-term natural gas demand would require expansion of the existing natural gas distribution system to serve newly developed areas. The gas distribution system and metering are owned, operated, and maintained by People's Gas up to and including the meters. It is expected that the 16-inch gas transmission line located at the station entrance would be able to provide unlimited supply to potential new users (CFDC 1996).

Electricity

The existing electrical power distribution system is adequate to meet the short-term electrical demand during the initial stage of redevelopment. However, long-term demand would require the ultimate receiving entity to make significant improvements to the existing electrical infrastructure, such as overall upgrades and expansions of the existing distribution system, and remetering the base to JEA's standards. The extent of the upgrades to the existing service distribution would depend on the specific needs of the future development activities.

Steam

The steam distribution system originates from a central steam generating plant. The plant houses three 40-year-old boilers capable of producing 95,000 lb/hr. The distribution system serves primarily industrial buildings, hangars, and some barracks. The distribution system is insulated with asbestos and is in fair condition. Under the Preferred Reuse Plan, the steam generating plant would be removed along with the aboveground steam lines; thus, requiring a new method for heat production. As a replacement to a centralized steam

producing plant, less expensive auxiliary boilers (a practice currently implemented) which are fed by gas line may be used, or electric or gas heating systems could be installed.

Compressed Air

Under the Preferred Reuse Plan, no short-term or long-term impacts are expected to occur to the compressed air systems. In general, the systems are in good condition. With scheduled maintenance and necessary repairs, the systems are anticipated to be adequate for civilian aviation activities.

Aviation Fuel

As stated in Section 3.9, the aviation fuel facilities at the station, consisting of the 103rd Street pipeline and the North Fuel Farm, will be closed and not be transferred for reuse. Therefore, under the Preferred Reuse Plan, the ultimate receiving entity or individual users would need to make capital improvements and establish systems for the receipt and storage of aviation fuel to support reuse of the airfield facilties.

Solid Waste

Based on projections generated by the City of Jacksonville Department of Public Utilities, Solid Waste Division (Perkins 1996), the Preferred Reuse Plan would generate approximately 150,000 tons of waste. This would constitute a reduction of approximately 150,000 tons from existing generation rates. Potentially, the city's waste collection services may be needed for land uses associated with the Preferred Reuse Scenario; however, this should not result in a significant impact.

4.9.2 Alternative Reuse Scenario 1

This alternative involves limited new development. All existing infrastructure assets would remain as under existing conditions. This alternative would create the least demand on utility services such as water, sewer, storm water, and solid waste. However, under this alternative, underused infrastructure assets are likely to deteriorate. As a result, some areas would need improvements to serve long-term reuse.

4.9.3 Alternative Reuse Scenario 2

ARS 2 involves a low-intensity approach to redevelopment, and emphasizes the reuse of existing buildings within the developed area of the Main Station. Existing infrastructure assets would be removed and/or replaced to support redevelopment. Infrastructure improvements to the Yellow Water Area are not expected; however, maintenance of existing infrastructure systems would be required to support light industrial or other market-driven development at the former ordnance storage areas. Impacts to the existing utility system on the Main Station would be similar to ARS 1, although there is a potential for more immediate reuse of the systems because of local interest and control of the redevelopment process. It is expected that JDPU would maintain its plans to assume responsibility for the water and sewer systems; however, proposed improvements may be delayed.

4.9.4 Alternative Reuse Scenario 3

ARS 3 involves the redevelopment of NAS Cecil Field for commercial, industrial, and residential land use activities. The distinctive features of this scenario are large residential and commercial components and the lack of aviation facilities. It is anticipated that the redevelopment would be more extensive because it would not be limited by aircraft operation activities. Significantly more infrastructure extensions and improvements would be required under ARS 3, than under the Preferred Reuse Plan. As in the Preferred Plan, the long-term objectives of this scenario necessitate connection to JDPU's water and sewer systems and the development of site-specific and site-wide storm water management plans and facilities.

4.9.5 Alternative Reuse Scenario 4

ARS 4 involves the redevelopment of NAS Cecil Field as described under the Preferred Reuse Plan, but includes correctional and juvenile justice facilities at the Yellow Water Area and light industry development at the Main Station. Infrastructure system improvements to the Yellow Water Area would be more extensive than in the Preferred Reuse Plan at buildout, and similar to the requirements under ARS 3. Impacts to the existing infrastructure system on the Main Station would be less extensive than under ARS 3 at buildout, and similar to the requirements under the Preferred Reuse Plan. It is expected that JDPU's plan for the provision of water and sewer facilities would be similar to those proposed in the Preferred Reuse Plan.

4.9.6 Cumulative Impacts

The cumulative impact of redevelopment of NAS Cecil Field, combined with residential development east of NAS Cecil Field and JDPU's previous commitments to their WWTP and water treatment and distribution system, has the potential to affect the existing sewer and water systems and increase the magnitude of storm water runoff in the general area. However, the cumulative impact of these actions are not expected to cause any significant problems.

At present, JDPU has a 1.5-mgd commitment to their District 3 WWTP, and a 10-mgd commitment to their North Grid water treatment and distribution system. JDPU's commitments vary over time because of new project commitments and the elimination of old project commitments. Therefore, no capacity problems are expected (Lund 1996). In addition, because storm water management and retention are issues governed by existing development ordinances, it is expected that adequate measures for storm water runoff retention will be implemented on the former station and surrounding property.

There are no other reasonably foreseeable projects proposed in the southwest district that would cumulatively affect the capacity and distribution of these infrastructure systems.

4.9.7 Mitigation Measures

To address the potential effects resulting from long-term redevelopment at the station on various elements of the infrastructure, the ultimate receiving entity would implement a series of site-specific plans to guide improvement/expansion of these systems (CFDC 1996). These include:

- A master potable water supply system plan;
- A master sanitary sewer system plan; and
- A master site drainage plan.

These plans would be incorporated into the city's overall capital improvement program approved by the City Council (see Section 4.1). In order to implement long-term integration of the station property into regional infrastructure systems, the city would also be required to amend its Urban Service Area boundary, which defines areas with priority for public infrastructure investments. This would be accomplished through the comprehensive plan process. In addition, the receiving entity would ensure that new site-specific projects can be adequately served by infrastructure systems in place or systems planned to be expanded.

4.10 Cultural Resources

4.10.1 Preferred Reuse Plan

Archaeological Resources

As discussed in Section 3.10, 16 archaeologically sensitive areas were identified at the Main Station and the Yellow Water Area in the base-wide cultural resource assessment for NAS Cecil Field (E & E 1995). The following paragraphs assess the potential impacts to these areas based upon the characteristics of land uses proposed under the Preferred Reuse Plan.

Conservation. One potentially sensitive area is located in a portion of the Main Station designated for conservation. Because no new development would occur in this area, no impacts would occur.

Forestry. Two potentially sensitive areas are located in a portion of the Yellow Water Area designated for forestry management. Because no new development would occur in this area, no impacts would occur.

Forestry/Airport Reserve. Eight potentially sensitive areas are located in portions of the Main Station designated for forestry management for the next 25 years. In the long term, these areas would be used for airport expansion if required. Given that no new development would occur in the foreseeable future, no impacts would occur to potential resources in these areas. In the long term, these areas could be affected by construction activities. However, because airport expansion would require further federal actions in the form of approval and permitting from the FAA, it would be subject to future documentation and clearance under NEPA and the NHPA.

Parks and Recreation. Two potentially sensitive areas are located in a portion of the Main Station designated for parks and recreation (i.e., golf course). No substantial new development would occur in this area, given that the golf course is currently in place. Therefore, no impacts would occur to potential resources in this area.

Light Industrial. Two potentially sensitive areas are located in a portion of the Yellow Water Area designated for future light industrial uses. Depending on the site-specific

location and design of individual developments, potential resources in these areas could be affected by construction activities.

Architectural Resources

All 457 standing structures evaluated at the station were determined to be ineligible for inclusion in NRHP. In August 1995, the FDHR concurred with this finding (see Appendix C). Therefore, no impacts would occur to historic architectural resources as a result of implementation of the Preferred Reuse Plan.

4.10.2 Alternative Reuse Scenario 1

Archaeological Resources

Implementation of ARS 1 would result in no development outside currently disturbed areas. Therefore, no impacts would occur to archaeological resources.

Architectural Resources

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 1.

4.10.3 Alternative Reuse Scenario 2

Archaeological Resources

Implementation of ARS 2 would result in no development outside currently disturbed areas. Therefore, no impacts would occur to archaeological resources.

Architectural Resources

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 2.

4.10.4 Alternative Reuse Scenario 3

Archaeological Resources

Among the various alternatives, implementation of ARS 3 would result in the greatest potential for affecting archeological resources at the station. The following paragraphs assess

the potential for impacts to sensitive areas based upon the characteristics of land uses proposed under the Preferred Reuse Plan.

Conservation. Six potentially sensitive areas are located in a portion of the Main Station designated for conservation. Because no new development would occur in this area, no impacts would result from implementation of ARS 3.

Parks and Recreation. Two potentially sensitive areas are located in a portion of the Main Station designated for parks and recreation (i.e. golf course). No substantial new development would occur in this area, given that the golf course is currently in place. Therefore, no impacts would occur to potential resources in this area.

Residential. Three potentially sensitive areas are located in a portion of the Main Station designated for a new residential community. Based on the large amount of construction necessary to implement this proposal, it is likely that significant affects to potential resources could occur.

Light Industrial. Four potentially sensitive areas are located in a portion of the Yellow Water Area designated for future light industrial uses. Depending on the site-specific location and design of individual developments, potential resources in these areas could be affected by construction activities.

Architectural Resources

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 3.

4.10.5 Alternative Reuse Scenario 4

Archaeological Resources

Implementation of ARS 4 would result in the same impacts as under the Preferred Reuse Plan.

Architectural Resources

No significant impacts would occur to historic architectural resources as a result of implementation of ARS 4.

4.10.6 Cumulative Impacts

There are no reasonably foreseeable actions in the area that could cumulatively affect cultural resources. All potential impacts are localized in nature and would occur exclusively on the former station property.

4.10.7 Mitigation Measures

To mitigate any potential future impacts to archaeological resources on the station property that could result from redevelopment activities, the Navy has entered into a programmatic agreement with FDHR (Couch 1996). This agreement outlines the measures to be taken and entities responsible for ensuring further investigation and mitigation of potentially sensitive areas identified if these areas are targeted for new development after disposal of the station. A copy of the signed programmatic agreement is presented in Appendix E.

4.11 Hazardous Materials Management and Environmental Contamination

The following section discusses the impact of the Navy's hazardous materials management and environmental restoration programs on reuse of the station. For each reuse alternative, the impact of hazardous materials management and environmental contamination is addressed. The EBS discussed in Section 3.10 identified the status of all station properties that have been associated with storage, release, and disposal of hazardous substances and petroleum products. Only those facilities/properties that have been identified as "clean" are suitable for transfer. For those facilities/properties identified as unsuitable for transfer, the Navy is required under CERCLA Section 120(h) to take "all remedial actions necessary to protect human health and the environment with respect to any such [hazardous] substance remaining on the property" prior to transfer.

To remediate potentially contaminated properties, DoD requires that a BRAC Cleanup Team be established to develop a BRAC cleanup plan to guide the actions, schedule, and funding required for remediation of the properties; and complete all environmental programs at NAS Cecil Field. Its goal is to expedite and improve remedial actions in order to facilitate the disposal and reuse of property. The BRAC Cleanup Team is composed of representatives

from the Navy, EPA, and FDEP in consultation with CFDC. Consultation with CFDC ensures that priorities for parcel reuse and development will be reconciled with the need to protect human health and the environment.

Based on the *EBS Report*, approximately 93% of the land area at NAS Cecil Field is classified suitable for transfer (see Table 4-48). Facilities or parcels that are not suitable for transfer are AOIs. The *BRAC Cleanup Plan* addresses the original sixteen AOIs identified by NAS Cecil Field prior to the EBS with the IRP sites. AOIs are those areas identified in the *EBS Report* as red (properties that have confirmed contamination, and response action is underway, but not final), yellow (properties that have confirmed contamination, and response action has not yet begun), or grey (properties that may or may not be contaminated, and that require further investigation). Those AOIs not covered under established environmental programs at NAS Cecil Field, such as the Tank Management Plan, will be investigated and remediated consistent with the requirements of the FDEP Petroleum Program.

The schedule for investigation and remediation of AOIs is based on a prioritization system that reconciles the reuse and transfer priorities of CFDC with protection of human health and the environment. The BRAC Cleanup Team divided NAS Cecil Field into 10 zones, with each zone representing a transferable unit. The intent of the zone designation is to target available resources (i.e., staffing, funding) to complete remedial activities according to reuse priorities.

Although CERCLA Section 120(h) requires that all remedial actions necessary to protect human health and the environment be performed prior to transfer, CERFA amended CERCLA to allow that transfer is not precluded by "long-term pumping and treating, or operation and maintenance, after the remedy has been demonstrated to the Administrator [of EPA] to be operating properly and successfully."

Prior to any lease or transfer of property, the Navy must complete a parcel-specific EBS. Pursuant to the findings of the parcel-specific EBS and approval by EPA and FDEP, the Navy will make a parcel-specific FOSL or FOST.

4.11.1 Preferred Reuse Plan

4.11.1.1 Hazardous Materials Management

Uses proposed for development at NAS Cecil Field under the Preferred Reuse Plan will involve the use of hazardous materials and generation of hazardous wastes. Types of hazardous materials/wastes typical for these land uses and associated activities/processes are

Table 4-48

SUITABILITY OF PROPERTY FOR TRANSFER AT NAS CECIL FIELD

Color Classification[a]	Suitability for Transfer	Acreage at NAS Cecil Field[b]
White	Suitable	18,722
Blue	Suitable	10
Light Green	Suitable	26
Dark Green	Suitable	0
Yellow	Not suitable	22
Red	Not suitable	96
Grey	Not suitable	1,300

[a] For definitions of color codes, see Figure 3-24 and Table 3-23.

[b] Acreages include OLF Whitehouse, which is not proposed for disposal.

Source: ABB-ES 1995.

shown on Table 4-49. The quantity of hazardous material used or generated cannot be quantified at this time. However, in compliance with the Emergency Planning and Community Right to Know Act, storage of hazardous material above a threshold level must be reported to a local emergency planning committee. This law requires emergency notification for accidental releases and reporting of toxic chemical releases. Storage, transportation, and disposal of hazardous waste will require compliance with RCRA as implemented through the Florida hazardous waste management regulations. Therefore, based on the current regulatory structure, the Preferred Reuse Plan will not result in an increase in areas of environmental contamination, and no significant impacts are anticipated from hazardous materials and waste management.

4.11.1.2 Environmental Contamination

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under the Proposed Reuse Plan, but none of the proposed land uses would be significantly impacted because of the vast area of land available for development. Table 4-50 lists the proposed land uses under the Preferred Reuse Plan by zone and the remedial priority of each zone. However, the ultimate decision as to development on an IRP, AOI, or other area of environmental contamination will be determined after the Record of Decision (ROD) on the Remedial Design/Remedial Action (RD/RA) of the site. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property.

The following discussion highlights the IRP sites, the original 16 AOIs, and other potentially significant areas of environmental contamination that may be precluded from development within proposed land uses. Table 4-51 lists only the IRP and AOIs by land use.

Forestry. One IRP site is located in the area of NAS Cecil Field proposed for use as forestry. IRP-14, the Blue 5 Ordnance Disposal Area, is located in the Yellow Water Area. Between 1967 and 1977, an estimated 30,000 to 45,000 pounds of ordnance was detonated at this site, including fuses, bombs, large munitions, and explosive material (ABB-ES 1994). Of the total 2,835 acres proposed for forestry operations, approximately 4.5 acres are covered by the IRP-14 site.

Although no IRP sites or AOIs are located in the area of the Main Station proposed for forestry use, AOI-35 borders the east side. AOI-35, Perimeter Road, is considered one of

Table 4-49

TYPICAL HAZARDOUS MATERIALS/WASTES BY LAND USE CATEGORY

Land Use	Alternative Reuse Scenarios					Waste-Generating Industries/Processes	Hazardous Materials/Wastes
	Preferred Reuse Plan	ARS 1	ARS 2	ARS 3	ARS 4		
General Aviation/ Helicopter Operations	X	X	X		X	Aircraft refueling; aircraft maintenance.	Fuels, solvents, paints, hydraulic fluids, degreasers, thinners, corrosives, compressed gases, adhesives, batteries.
Forestry	X	X	X		X	Equipment maintenance; weed and pest control.	Fuels, oils, solvents, paints, thinners, pesticides/herbicides.
Conservation/Open Space	X			X	X	Minimal to none.	Minimal to none.
Aviation-Related Services	X	X	X		X	Aircraft maintenance; administration/helicopter operations.	Fuels, solvents, paints, metals, hydraulic fluids, degreasers, thinners, corrosives, compressed gases, adhesives/sealants, batteries, sand-blast media, paint removers.
Parks and Recreation	X	X	X	X	X	Equipment maintenance; weed and pest control; landscaping; building maintenance.	Fuels, oils, solvents, paints, thinners, adhesives/sealants, herbicides/pesticides, fertilizers, household cleaners, chlorine.
Commercial	X			X	X	Building maintenance.	Household cleaners, solvents, paints, pesticides/herbicides.
Light Industry	X			X	X	Building maintenance; equipment storage and distribution.	Fuels, oils, solvents, paints, degreasers, cleaners, thinners.
Heavy Industry	X			X	X	Parts manufacturing and assembly; metal fabrication.	Solvents, lubricants, cleaners, corrosives, acids, heavy metals, catalysts, fuels.
Ordnance Storage		X				Ordnance storage.	Explosives, heavy metals.
Planned Residential				X		House and yard maintenance.	Paints, solvents, household cleaners.

Table 4-49

TYPICAL HAZARDOUS MATERIALS/WASTES BY LAND USE CATEGORY

Land Use	Alternative Reuse Scenarios					Waste-Generating Industries/Processes	Hazardous Materials/Wastes
	Preferred Reuse Plan	ARS 1	ARS 2	ARS 3	ARS 4		
Correctional Facility/ Juvenile Justice Facility					X	Building maintenance; shops.	Paints, solvents, household cleaners, thinners, pesticides/herbicides.
Market-Driven Development/Business Park/ Non-Aviation Incubator		X	X	X		Research and development; office/building maintenance.	Laboratory wastes.

Source: Ecology and Environment, Inc. 1996.

Table 4-50

REMEDIAL ZONES FOR PREFERRED REUSE PLAN

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
A	Yellow Water Weapons Area	14, 15	Forestry Parks and Recreation Heavy Industry Light Industry Commercial	2
B	Golf Course and Residential	11	Heavy Industry Parks and Recreation	5
C	Developed Non-Industrial	12	Heavy Industry Aviation-Related Services Parks and Recreation	3
D	Flightline Industrial Area	7, 16	General Aviation Aviation-Related Services	1
E	Jacksonville Heights		Light Industry Commercial	7
F	Non-Developed West Area	1, 2, 3, 4, 5, 6, 9, 10, 17, 19	Forestry Forestry/Airport Reserve Parks and Recreation General Aviation Aviation-Related Services	8
G	Non-Developed South Area	8	Forestry/Airport Reserve Conservation	10
H	AVORD and Non-Developed East Area	18	Forestry/Airport Reserve General Aviation	9
—	NAS Jacksonville - Cecil Field Jet Fuel Pipeline Commercial Boundary	—	—	4

Key at end of table.

Table 4-50

REMEDIAL ZONES FOR PREFERRED REUSE PLAN

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
—	OLF Whitehouse Flightline	—	—	6
—	Palatka Radar Site	—	—	11

Key:

IRP = Installation Restoration Program.

Source: ABB-ES 1995; Arthur Andersen 1995.

Table 4-51

IRP/AOI SITES WITHIN LAND USE CATEGORIES - PREFERRED REUSE PLAN

Land Use	IRP/AOI Sites
Forestry	IRP-14 Blue 5 Ordnance Disposal Area IRP-17 Oil/Sludge Disposal Pit AOI-35 PCBs on Perimeter Road
Light Industry	None
Parks and Recreation	IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-5 Oil Disposal Area IRP-6 Lake Fretwell Rubble Disposal Area IRP-11 Golf Course Pesticide Disposal Area IRP-15 Blue 10 Ordnance Disposal Area IRP-19 Rowell Creek Rubble Disposal Area AOI-20 Hazardous Waste Storage Facility AOI-21 Golf Course Maintenance Area AOI-22 Golf Course Fairway 7 Disposal Area AOI-35 PCBs on Perimeter Road
Heavy Industry	IRP-12 Public Works Rubble Disposal Area AOI-25 Transformer Storage Yard AOI-26 Building 81 DDT Site AOI-27 Building 81 HAZMAT Shed AOI-35 PCBs on Perimeter Road
Aviation-Related Services	IRP-7 Old Fire Fighting Training Area IRP-16 AIMD Seepage Pit AOI-28 North TCP Site AOI-29 Building 313 TCP Site AOI-30 Building 313 AOI-31 South TCP Site AOI-32 Supply Building 335 HAZMAT Storage Area AOI-33 DRMO Storage Area AOI-35 PCBs on Perimeter Road
General Aviation	IRP-3 Oil/Sludge Disposal Pits IRP-4 Grease Pits IRP-17 Oil/Sludge Disposal Pit Southwest AOI-35 PCBs on Perimeter Road
Forestry/Airport Reserve	IRP-1 Old Landfill IRP-2 Recent Landfill IRP-8 Bore Site Range/Hazardous Waste Storage Area/Fire Fighting Training IRP-9 Recent Grease Pits IRP-10 Rubble Disposal Area IRP-18 Ammunition Disposal Area AOI-23 Aviation Ordnance Area (AVORD) Site AOI-24 AVORD Pistol Range Site AOI-34 Rowell Creek Ordnance Disposal Area AOI-35 PCBs on Perimeter Road
Commercial	None
Conservation	None

Source: Ecology and Environment, Inc. 1996.

the original 16 AOIs due to the reported use of PCB-contaminated oil on the road for dust control.

Light Industry. No IRP sites or AOIs are located in areas proposed for light industry. However, the YWWC was categorized as a "grey" area during the EBS. Further investigation is required to determine whether environmental contamination occurred from the previous use of munitions and weapons in this area (ABB-ES 1994).

Parks and Recreation. Seven IRP sites and four of the original AOIs are located in portions of the station proposed for redevelopment as parks and recreation. IRP-15, the Blue 10 Ordnance Disposal Area, is located in the southwest portion of the Yellow Water Area. An inventory of ordnance disposed of at this site includes small arms, parachute and distress flares, signal cartridges, rocket ignitors, and cartridge-activated devices (ABB-ES 1994). AOI-20 is also located in the proposed parks and recreation area north of Normandy Boulevard. This storage and staging area for hazardous and nonhazardous wastes adjoins a permitted hazardous waste storage facility (Building 610). Most of the southwest quadrant of the Yellow Water Area is classified "white" or suitable for transfer, although some areas of concern were identified, including an abandoned wastewater treatment plant, an abandoned transportation maintenance facility, abandoned munitions magazines, and the former artillery range.

The remainder of the IRP sites/AOIs in the area proposed for parks and recreation are located in the Main Station. Several of the sites are located within the existing golf course, including IRP-11 (Golf Course Pesticide Disposal Area), AOI-21 (Golf Course Maintenance Area), and AOI-22 (Golf Course Fairway 7 Disposal Area). These are areas where pesticides, pesticide containers, and other solid waste was disposed. The golf course itself has been categorized as "grey," due to the past application of pesticides, herbicides, and nutrients, and the potential for these substances to affect adjacent waterways (ABB-ES 1994).

The other IRP sites surround Lake Fretwell and includes two oil disposal areas (IRP-3 and IRP-5), grease disposal pits (IRP-4), and two rubble disposal areas (IRP-6 and IRP-19). Approximately 220 acres surrounding Lake Fretwell are categorized "grey" because the area adjoins IRP sites. However, the Lake Fretwell Recreation Complex to the northeast of Lake Fretwell has been categorized "white" or "suitable for transfer." Of the 2,943 acres proposed for parks and recreation, approximately 32 acres are covered by known IRP sites outside of the golf course, and 221 acres cover the entire golf course including IRP-11 (4 acres). AOI-35, Perimeter Road, also traverses a section of the area proposed for parks and recreation.

Heavy Industry. One IRP site and four of the original AOIs are located in portions of the station proposed for redevelopment as heavy industrial uses. These sites are all located in the Main Station. IRP-12 is a rubble disposal area covering an area approximately 0.5 acre, which was used for the disposal of lumber, concrete, wire, drums, and other inert rubble (ABB-ES 1994). AOIs 25, 26, and 27 and several other buildings in the area are categorized "grey." AOIs-25, 26, and 27 are all located near Building 81, the Fluor-Daniel Service Maintenance Building. AOI-25 is a storage yard adjacent to Building 81, which was formerly used to store several hundred transformers of which some contained PCBs in the dielectric fluid. AOI-26 is a room within Building 81 where pesticides, including DDT, were stored and mixed. AOI-27 is located across from Building 81, and was used as a storage area for 55-gallon drums of hazardous and nonhazardous waste. A section of Perimeter Road, AOI-35, traverses the proposed heavy industrial area at the north end.

The TFM compound (old and new filling stations) consists of Building Nos. 49, 80, 80C, 178, 180, 384, and 584. The compound was categorized "red" during the EBS because of known releases of petroleum products, the storage/handling of hazardous materials and petroleum products, and storm water flow to an unlined retention basin. An area of family housing at the western edge of the proposed heavy industry area is categorized "grey" due to the presence of fuel oil USTs, and the BEQs at the southeast edge of the area proposed for heavy industry is categorized "grey" due to the presence of asbestos. These facilities would be demolished prior to reuse of this area for heavy industry, and the demolition debris would be disposed according to state regulatory requirements.

The portions of the Main Station proposed for heavy industrial use exclusive of the IRP sites/AOIs and other specific buildings are categorized "white" or suitable for transfer.

Aviation-Related Services. Two IRP sites and seven of the original AOIs are located in the portion of the station proposed for redevelopment for aviation related services. IRP-16 is the AIMD Seepage Pit, which was formerly used to collect solvents, greases, and paint wastes from maintenance and repair of the aircraft in the adjacent hangars (Building Nos. 313, 815 and 825). The hangars are categorized "red" and three of the AOIs (AOI-28, -29, and -30), which are in the vicinity of IRP-16, are categorized as "grey" due to the storage or disposal of hazardous materials and hazardous waste. AOI-28 and AOI-29 are temporary collection points for waste materials. AOI-28 was used to collect wastes from maintenance of aircraft at Building No. 815, and AOI-29 served maintenance operations at Building No. 313. AOI-30 is a grassy area that was reportedly used for dumping solvents from operations in

Building No. 313. Some soil has been removed, but residual contamination may still exist (ABB-ES 1994).

IRP-7, which is located at the southwest corner of the development area, is the site of former firefighting operations. Liquid wastes were set on fire and suppressed as part of the training of firefighting operations. AOIs -31, -32, and -33 are located northwest of IRP-7. AOI-31 was used as a temporary collection point for hazardous waste from Building No. 860 (a maintenance hangar). AOI-32 is the site of initial warehousing and storage of hazardous materials upon arrival at the station, where alleged material spills occurred. Material for resale by the Defense Reutilization and Marketing Office was stored at AOI-33. Generally, material was nonhazardous and included furniture office equipment and aircraft parts, but more investigation is necessary (ABB-ES 1994).

FDEP Petroleum Program sites located in the area proposed for reuse as aviation-related services include the NFF and South Fuel Farm, where numerous fuel spills have occurred in the past; Day Tank No. 1, a 200,000-gallon tank that distributes jet fuel to the high-speed refuelers on the flightline; the Jet Engine Test Cell Facility; and an aircraft crash site, north of NFF.

The land area east of the heavy industrial area is categorized "white," exclusive of aforementioned sites and several other buildings. The area on the west side of the heavy industrial area encompasses the POW and MIA memorial. This entire area is categorized "grey" due to the appearance of unauthorized dumping of household refuse. Perimeter Road, AOI-35, also traverses the proposed aviation related services area at the north end.

General Aviation. Two IRP sites and one of the original AOIs are located in areas of the station proposed for use as general aviation. In addition, most of the airfield is categorized "grey" because of known and suspected releases of petroleum products. Two major fuel spills occurred (497,000 gallons in 1981 and 900,000 gallons in 1991) and migrated through the drainage system to Sal Taylor Creek. Other minor spills are believed to have been contained within the airfield complex (ABB-ES 1994).

Where the aviation facility proposes to expand beyond the airfield to the west, the proposed redevelopment encounters IRP-3 and IRP-17. These areas were used to dispose of oils, fuels, solvents, paints and paint thinners from the AIMD, squadrons, and public works shops. Pits were excavated and wastes were allowed to evaporate or seep into the soil. Expansion of the airfield to the south encounters AOI-35, a section of Perimeter Road upon which PCB-contaminated oils were spread as a dust control measure.

South of Lake Fretwell is a crash site. The crash occurred in February 1992, and the aircraft reportedly spilled 1,800 to 2,000 gallons of fuel. The site is included within the Tank Program (ABB-ES 1994).

Forestry/Airport Reserve. Most of the open land proposed for use as forestry and aviation reserve is categorized "white." Some suspect areas have been categorized "grey," based on visible debris or potential migration from fuel spills and IRP sites.

Seven IRP sites and four of the original AOIs are located in the area of the base proposed for use as forestry and eventual airport expansion. Six of the seven IRP sites and one of the AOIs are located southwest of the airfield. Several of the sites are associated with waste disposal practices. IRP-1 is the former base landfill that was used from the early 1950s through 1965. The landfill was replaced in 1965 by another landfill just northwest of the original that operated until 1975. This landfill is IRP-2. Almost directly east of IRP-1 is IRP-10, a rubble disposal area used in the 1950s and 1960s for disposal of demolition debris, concrete, tires, and asphalt. AOI-34 is located south of these two IRP sites, where ordnance was reportedly dumped from the bridge over Rowell Creek. IRP-9, or the Recent Grease Pits, is an area that was used to dispose of an estimated 24,000 to 30,000 gallons of grease and water from base messes (ABB-ES 1994). IRP-8 is located at the boresite range, an area used for small arms and machine gun target practice. A hazardous waste storage facility is located at the bore site range, and the range was also used for firefighter training.

Another area of potential environmental contamination in this area is the jet "run-up area," where jet engines were run in front of air deflectors to obtain proper engine temperature. This site is categorized "grey" because evidence of fuel leakage. A retention basin used to contain fuel spills from entering Sal Taylor Creek is also categorized "grey.".

The Aviation Ordnance (AVORD) Area northeast of the airfield is associated with two of the original AOIs. AOI-23 is an area behind Building No. 65, where potential contamination was observed. Building No. 65 was used to belt ammunition rounds and load them into metal box containers for aircraft use in support of military operations. Some release or disposal associated with these operations is suspected. AOI-24 is north of the AVORD Pistol Range Site. Because the original range was open, AOI-24 is suspected of containing concentrations of discharged lead bullets. IRP-18 is located near the eastern boundary of the Main Station in an area proposed for redevelopment for forestry/aviation reserve. It was used for ordnance disposal. All of Perimeter Road included with the development area is considered an AOI (AOI-35) due to the use of PCB-contaminated oil for dust suppression.

Of a total of 4,081 acres proposed for forestry/airport reserve, approximately 27 acres are covered by known IRP sites.

Other. No IRP/AOI or other significant areas of environmental concern are located in portions of the station proposed for redevelopment as commercial or conservation uses.

4.11.2 Alternative Reuse Scenario 1

4.11.2.1 Hazardous Materials Management

Uses proposed for development at NAS Cecil Field under ARS 1 would involve hazardous materials and generation of hazardous wastes. Types of hazardous materials/wastes typical for these land uses and associated activities/processes are shown on Table 4-49. As stated under the Preferred Reuse Plan discussion (Section 4.11.1), existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure no release of hazardous substances occurs that will impact human health or the environment.

4.11.2.2 Environmental Contamination

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under ARS-1. However, none of the proposed land uses would be significantly impacted because of the vast area of developable land. Table 4-52 lists the proposed land uses under ARS 1 by zone and the remedial priority of each zone. However, the ultimate decision as to development on an IRP site, AOI or other area of environmental contamination will be determined after the ROD on the RD/RA for the site. Any restrictions on development will be incorporated into the FOSL or FOST and the lease or deed for the property.

The following discussion highlights the IRP sites, the original AOIs, and other potentially significant areas of environmental contamination that may be precluded from development within proposed land uses. Table 4-53 lists the IRP sites and AOIs by land use.

Table 4-52

REMEDIAL ZONES FOR ARS 1

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
A	Yellow Water Weapons Area	14, 15	Recreation/Forestry	2
B	Golf Course and Residential	11	Market-Driven Development Parks and Recreation	5
C	Developed Non-Industrial	12	Market-Driven Development Helicopter Operations Parks and Recreation	3
D	Flightline Industrial Area	7, 16	Recreation/Forestry Market-Driven Development Helicopter Operations	1
E	Jacksonville Heights		Recreation/Forestry	7
F	Non-Developed West Area	1, 2, 3, 4, 5, 6, 9, 10, 17, 19	Recreation/Forestry Market-Driven Development Parks and Recreation	8
G	Non-Developed South Area	8	Recreation/Forestry	10
H	AVORD and Non-Developed East Area	18	Recreation/Forestry	9
—	NAS Jacksonville - Cecil Field Jet Fuel Pipeline Commercial Boundary	—	—	4
—	OLF Whitehouse Flightline	—	—	6
—	Palatka Radar Site	—	—	11

Key:

IRP = Installation Restoration Program.

Source: ABB-ES 1995; Arthur Andersen 1995.

Table 4-53

IRP SITES/AOIs WITHIN LAND USE CATEGORIES FOR ARS 1

Land Use	IRP Sites/AOIs
Recreation/Forestry	IRP-1 Old Landfill IRP-2 Recent Landfill IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-8 Bore Site Range/Hazardous Waste Storage Area/Firefighting Training IRP-9 Recent Grease Pits IRP-10 Rubble Disposal Area IRP-14 Blue 5 Ordnance Disposal Area IRP-15 Blue 10 Ordnance Disposal Area IRP-17 Oil/Sludge Disposal Pit Southwest IRP-18 Ammunition Disposal Area AOI-20 Hazardous Waste Storage Facility AOI-23 Aviation Ordnance Area (AVORD) Site AOI-24 AVORD Pistol Range Site AOI-34 Rowell Creek Ordnance Disposal Area AOI-35 PCBs on Perimeter Road
Parks and Recreation	IRP-5 Oil Disposal Area IRP-4 Grease Pits IRP-6 Lake Fretwell Rubble Disposal Area IRP-11 Golf Course Pesticide Disposal Area IRP-19 Rowell Creek Rubble Disposal Area AOI-21 Golf Course Maintenance Area AOI-22 Golf Course Fairway 7 Area AOI-35 PCBs on Perimeter Road
Helicopter Operation	AOI-31 South TCP Site AOI-32 Supply Building 335 HAZMAT Storage Area AOI-33 DRMO Storage Area
Market-Driven Development	IRP-7 Old Firefighting Training Area IRP-12 Public Works Rubble Disposal Area IRP-16 AIMD Seepage Pit AOI-25 Transformer Storage Yard AOI-26 Building 81 DDT Site AOI-27 Building 81 HAZMAT Shed AOI-28 North TCP Site AOI-29 Building 313 TCP Site AOI-30 Building 313 AOI-35 PCBs on Perimeter Road

Source: Ecology and Environment, Inc. 1996.

Recreation/Forestry. Because of the large area proposed for use as recreation/ forestry, 11 IRP sites and five of the original AOIs are located within the proposed development. The other potentially significant areas of environmental contamination discussed are those occupying a large land area, generally defined as "red," "yellow," or "grey" areas larger than the footprint of a building.

IRP-14, IRP-15, AOI-20, and two expansive "grey" areas are located in the Yellow Water Area and associated with former activities that occurred there. IRP-14 and IRP-15 were sites used to dispose of ordnance, primarily through open detonation (ABB-ES 1994). The YWWC is categorized "grey" due to the previous use of munitions and weapons, and an area south of the YWWC is categorized "grey" because it was used as an artillery range. AOI-20 is located near the southern end of the Yellow Water Area, and was used for hazardous waste storage. Other areas of concern identified during the EBS in the Yellow Water Area include an abandoned wastewater treatment plant, several dumping sites, and an abandoned transportation maintenance facility (ABB-ES 1994).

Much of the land area on the Main Station is categorized "white," or "suitable for transfer." No environmental concerns were identified west of Perimeter Road, although Perimeter Road is identified as AOI-35 due to the application of PCB-contaminated oil for dust control.

Southwest of the airfield are IRP sites 1, 2, 3, 4, 8, 9, 10, and 17. IRP-1 and IRP-2 were formerly used to dispose of solid wastes. IRP sites 3, 4, 9, and 17 were used to dispose of oils, solvents, paints, and greases from various operations at the base. Wastes were dumped into unlined pits and allowed to evaporate or seep into the ground. IRP-8 is located within the boresite range, and was used for hazardous waste storage and also firefighting training activities. IRP-10 is a rubble disposal area and contains various demolition debris, concrete, tires, and asphalt. AOI-34 is located in the vicinity of these IRP sites, just south of IRP-1 and IRP-10. Ordnance was reportedly dumped from the bridge where Perimeter Road crosses Rowell Creek (ABB-ES 1994). The area surrounding Lake Fretwell and extending to the south to Sal Taylor Creek is categorized "grey" due to the number of IRP sites/AOIs, and the potential for plume migration (ABB-ES 1994).

South of Lake Fretwell is a crash site, which is included within the FDEP Petroleum Program. The crash occurred in February 1992, and the aircraft reportedly spilled 1,800 to 2,000 gallons of fuel (ABB-ES 1994).

The airfield is considered a "grey" area, and further investigation is required based on the known and potential fuel spills, and because of the pattern of storm water drainage from the developed core of NAS Cecil Field south toward Sal Taylor Creek across the airfield complex. At the southwest corner of the airfield is an area used for aircraft engine "run-up," where engines were run in front of air deflectors until the engines reached proper temperatures. Signs of fuel leakage were apparent during the EBS (ABB-ES 1994). A retention basin used to contain fuel spills from entering Sal Taylor Creek, and this area is categorized "grey." Some areas classified "grey" are located northeast of the airfield include areas of observed stressed vegetation, petroleum smells and rust-colored foam on a stream, metal debris, and 55-gallon drums.

Northeast of the airfield is the AVORD. AOI-23 and -24 are located in the AVORD, IRP-18 is in an undeveloped area south of the AVORD. Potential contamination at AOI-23 is associated with activities in Building No. 65. Ammunition rounds were belted and loaded into metal box containers for use in aircraft during military operations. AOI-24 is suspected to contain lead from the AVORD Pistol Range. IRP-18 is the site of an ammunition disposal area located at the intersection of a former service road and tributary of Sal Taylor Creek.

Helicopter Operations. Three of the original AOIs are located in the area proposed for reuse for helicopter operations. On the west side of the development area are AOIs -31, -32, and -33. AOI-31, which is located north of the runway, was the temporary collection point for hazardous waste generation from aircraft maintenance activities in Building No. 860. AOI-32 is located to the north of AOI-31, and refers to an area used for warehousing hazardous materials received at the station prior to distribution. AOI-33, which is also in the vicinity of AOIs-31 and -32, is an area where material was stored by the Defense Reutilization and Marketing Office for possible resale value. These sites are listed "grey" because of potential spills or releases of hazardous substances. In addition, several of the buildings in this area (including maintenance hangars and supply warehouses) are categorized "grey" due to the presence of friable asbestos, leaking USTs, and potential hazardous material releases.

Most of the land area is categorized "white." The POW and MIA memorial is located at the northern end of the helicopter operations area. This entire area is categorized "grey" due to the appearance of unauthorized dumping of household refuse (ABB-ES 1994).

Parks and Recreation. Five IRP sites and three of the original 16 AOIs are located in the area proposed for reuse for parks and recreation. Several of the sites are located within the existing golf course, including IRP-11 (Golf Course Pesticide Disposal Area), AOI-21

(Golf Course Maintenance Area), and AOI-22 (Golf Course Fairway 7 Disposal Area). At IRP-11, an estimated 200 to 450 5-gallon containers of pesticides, fungicides, and herbicides were buried in a wooded area between Fairways 11 and 17. Similarly, an unknown number of containers were buried in a wooded area west of Fairway 7 at AOI-22. AOI-21 is the area surrounding the golf course maintenance building (Building No. 238), where maintenance vehicles (including vehicles that applied pesticides) were washed. The golf course itself has been categorized as "grey," due to the past application of pesticides, herbicides, and nutrients and the potential for these substances to affect adjacent waterways (ABB-ES 1994).

The other IRP sites within the proposed parks and recreation use area surround Lake Fretwell, and include an oil disposal area (IRP-5), grease pits (IRP-4) and two rubble disposal areas (IRP-6 and -19). Approximately 220 acres surrounding Lake Fretwell are categorized "grey" because the area adjoins IRP sites. However, the Lake Fretwell Recreation Complex located northeast of Lake Fretwell has been categorized "white" or "suitable for transfer."

In addition, sections of Perimeter Road (AOI-35) traverse the proposed park and recreation use area on the north and west sides of the development area. Perimeter Road is considered one of the original 16 AOIs due to the reported use of PCB-contaminated oil for dust control on the road.

Of a total of 573 acres proposed for park and recreation, approximately 20 acres are covered by known IRP sites.

Market-Driven Development. Three IRP sites and seven of the original AOIs are located in the area proposed for market-driven development. To the northwest is IRP-12, the Public Works Rubble Disposal Area, which was used for disposal of construction debris such as concrete, wood, and scrap metal. Three AOIs are south of IRP-12 and north of 9th Street: AOI-25, the location for storage of several hundred transformers; AOI-26, an area within Building No. 81 where pesticides, including DDT, were stored and mixed; and AOI-27, an area used for storage of hazardous/nonhazardous waste in 55-gallon drums. Just west of these AOIs is the TCM compound at the corner of "D" Avenue and 9th Street. This area encompasses Building No. 49, 80, 80C, 178, 180, 384, and 584, and it is categorized "red" because petroleum releases are known to have occurred. Areas of concern within the compound include USTs, ASTs, oil-water separators, drum storage areas, and a retention pond.

AOI-35, Perimeter Road, on which PCB-contaminated oil was historically used for dust control, traverses the proposed development area at the north. The AIMD Seepage Pit and three of the AOIs (AOI-28, -29, and -30) are east of the development area. Maintenance and repair of aircraft in the adjacent hangars (Building Nos. 313, 815, and 825) generated

various solvents, paints, greases and other hazardous materials/wastes that were historically disposed through a sump to a holding tank, and a seepage pit (IRP-16). A wash disposal area associated with Building No. 313 (AOI-30) and hazardous waste collection points (AOI-28 and -29) are categorized "grey" due to the potential for a spill or release to have occurred. The hangars are categorized "red" because they are within the IRP-16 plume, and contamination is known to have occurred (ABB-ES 1994).

Tank Program sites located in the area proposed for market-driven development include the NFF and South Fuel Farm, where numerous fuel spills have occurred. Spills have occurred at: Day Tank No. 1, a 200,000-gallon tank that distributes jet fuel to the high-speed refuelers on the flightline; the Jet Engine Test Cell Facility; and an aircraft crash site, north of NFF.

IRP-17, the site of former firefighting operations, is located at the southwest corner of the proposed development area, just northwest of the runway.

Two areas of housing are located within the area proposed for market-driven development. An area of family housing on the western edge area is categorized "grey" due to the presence of fuel oil USTs; the BEQ in the center of the development area is categorized "grey" due to the presence of asbestos.

4.11.3 Alternative Reuse Scenario 2

4.11.3.1 Hazardous Materials Management

Uses proposed for development at NAS Cecil Field under ARS 2 would involve hazardous materials and the generation of hazardous wastes. Types of hazardous materials/wastes typical for these land uses and associated activities/processes are shown on Table 4-49. As stated under the Preferred Reuse Plan discussion (Section 4.11.1), existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure that no release of hazardous substances occurs that will impact human health or the environment.

4.11.3.2 Environmental Contamination

Existing areas of environmental contamination may delay or restrict reuse of limited areas of NAS Cecil Field from development under ARS 2. However, none of the proposed land uses would be significantly impacted because of the vast area of potential development. Table 5-54 lists the proposed land uses under ARS 2 by zone and the remedial priority of each zone. However, the ultimate decision as to development on an IRP site, AOI, or other

Table 4-54

REMEDIAL ZONES FOR ARS 2

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
A	Yellow Water Weapons Area	14, 15	Forestry Parks and Recreation Market-Driven Development	2
B	Golf Course and Residential	11	Market-Driven Development Parks and Recreation	5
C	Developed Non-Industrial	12	Heavy Industry General Aviation Parks and Recreation	3
D	Flightline Industrial Area	7, 16	General Aviation Market-Driven Development	1
E	Jacksonville Heights		Forestry	7
F	Non-Developed West Area	1, 2, 3, 4, 5, 6, 9, 10, 17, 19	Forestry Market-Driven Development Parks and Recreation General Aviation	8
G	Non-Developed South Area	8	Forestry General Aviation	10
H	AVORD and Non-Developed East Area	18	Forestry General Aviation	9
—	NAS Jacksonville - Cecil Field Jet Fuel Pipeline Commercial Boundary	—	—	4

Key at end of table.

Table 4-54

REMEDIAL ZONES FOR ARS 2

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
—	OLF Whitehouse Flightline	—	—	6
—	Palatka Radar Site	—	—	11

Key:

IRP = Installation Restoration Program.

Source: ABB-ES 1995; Arthur Andersen 1995.

area of environmental contamination will be determined after the ROD based on the RD/RA for the site. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property.

The following discussion highlights the IRP sites, the original AOIs, and other potentially significant areas of environmental contamination that may be precluded from development within proposed land uses. Table 4-55 lists the IRP sites and AOIs by land use.

Forestry. Most of the land area proposed for forestry use is categorized "white" or "suitable for transfer." However, eight IRP sites, totalling approximately 33 acres, and four of the original AOIs are located in proposed forestry areas. To the north, IRP 14 is the only IRP site within the proposed forestry area. An estimated 30,000 to 45,000 pounds of ordnance were detonated between 1966 and 1977 in an approximate 4.5-acre area (ABB-ES 1994). An abandoned bunker and a small area of concrete rubble are located in the same area. Other identified potential areas of concern include three small dumping sites northeast of the YWWC (ABB-ES 1994).

IRP sites 1, 2, 8, 9, 10, 17 and 18, and AOIs 23, 24, 34, and 35 are located in areas of the Main Station proposed for use as forestry. Most of these sites are located in a concentrated area southwest of the airfield. IRP-1 is bordered by Perimeter Road on the south and west, and by Rowell Creek on the east. It was the original base landfill, constructed in the early 1950s. Immediately northwest is IRP-2, the base landfill, which was constructed in 1965 to replace IRP-1 and operated through 1975. IRP-10 is across Rowell Creek from IRP-1, which was a disposal area for demolition debris, concrete, tires, asphalt, and furniture during the 1950s and 1960s (ABB-ES 1994). AOI-34 is located where Perimeter Road crosses Rowell Creek just south of IRP-1 and IRP-10. Ordnance was reportedly dumped from the bridge into Rowell Creek.

IRP-9, a grease disposal pit, abuts the runway northeast of IRP-10. An estimated 24,000 to 30,000 gallons of grease and water from base messes were disposed of in IRP-9. IRP-8 is located at the boresite range. IRP-8 is an area used for small arms and machine gun target practice. Hazardous waste was stored in an area of the boresite range, and firefighting training activities also occurred there. The training area consists of three unlined bermed pits where waste flammable liquids (i.e., fuels, oils, solvents, paints, paint thinners) were drained and ignited (ABB-ES 1994). The jet "run-up" is north of IRP-8. The two areas north of IRP-8 are categorized "grey" for further investigation.

Table 4-55

IRP SITES/AOIs WITHIN LAND USE CATEGORIES FOR ARS 2

Land Use	IRP Sites/AOIs
Forestry	IRP-1 Old Landfill IRP-2 Recent Landfill IRP-8 Bore Site Range/Hazardous Waste Storage Area/Firefighting Training IRP-9 Recent Grease Pits IRP-10 Rubble Disposal Area IRP-14 Blue 5 Ordnance Disposal Area IRP-17 Oil/Sludge Disposal Pit Southwest IRP-18 Ammunition Disposal Area AOI-23 Aviation Ordnance Area (AVORD) Site AOI-24 AVORD Pistol Range Site AOI-34 Rowell Creek Ordnance Disposal Area AOI-35 PCBs on Perimeter Road
Parks and Recreation	IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-5 Oil Disposal Area IRP-6 Lake Fretwell Rubble Disposal Area IRP-11 Golf Course Pesticide Disposal Area IRP-15 Blue 10 Ordnance Disposal Area IRP-19 Rowell Creek Rubble Disposal Area AOI-20 Hazardous Waste Storage Facility AOI-21 Golf Course Maintenance Area AOI-22 Golf Course Fairway 7 Area AOI-35 PCBs on Perimeter Road
General Aviation	IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-16 AIMD Seepage Pit IRP-17 Oil/Sludge Disposal Pit Southwest AOI-28 North TCP Site AOI-29 Building 313 TCP Site AOI-30 Building 313 AOI-31 South TCP Site AOI-32 Supply Building 335 HAZMAT Storage Area AOI-33 DRMO Storage AreaAOI-35 PCBs on Perimeter Road AOI-35 PCBs on Perimeter Road
Market-Driven Development	IRP-7 Old Firefighting Training Area IRP-12 Public Works Rubble Disposal Area AOI-25 Transformer Storage Yard AOI-26 Building 81 DDT Site AOI-27 Building 81 HAZMAT Shed AOI-35 PCBs on Perimeter Road

Source: Ecology and Environment, Inc. 1996.

Because the southwestern part of NAS Cecil Field has a concentrated number of IRP sites, the land area encompassing them is categorized "grey" due to the possibility of contaminant migration.

IRP-18, AOI-23, and AOI-24 are located on the eastern side of NAS Cecil Field. AOI-23 is an area behind Building No. 25, which is suspected to be contaminated from munitions and weapons loading operations in the building. AOI-24 is north of the AVORD Pistol Range site. Because the original range was open, AOI-24 is suspected of containing concentrations of discharged lead bullets. IRP-18 was a former ordnance disposal site. In addition to the IRP sites and AOIs on the eastern side of the airfield, several potential areas of environmental contamination exist. During the EBS, areas of stressed vegetation, petroleum smells and rust-colored foam on a stream, metal debris, and 55-gallon drums were observed (ABB-ES 1994).

AOI-35, which encompasses all of Perimeter Road, crosses much of the area proposed for forestry use.

General Aviation. Four IRP sites and seven of the original AOIs are located in areas of the station proposed for use as a general aviation facility. During the EBS, most of the airfield was categorized "grey" due to known or suspected releases of petroleum products. Two major spills (497,000 gallons in 1981 and 900,000 gallons in 1991) migrated through the drainage system to Sal Taylor Creek. Other minor spills are believed to have been contained within the airfield complex (ABB-ES 1994).

Where the airfield facility proposes to expand beyond the existing airfield to the west, the proposed redevelopment encounters IRP-3, IRP-4, and IRP-17. These sites are located adjacent to Perimeter Road, on the east side. At these sites, liquid wastes (including oil, fuel, tank sludges from the Tank Farms, solvents, paints and paint thinners) were disposed into unlined pits. Volatiles evaporated, and remaining wastes seeped into the ground. Wastes were reportedly ignited at various times. IRP-3 consists of a 6-acre area encompassing 3 or 4 pits. IRP-4 is approximately 9 acres in size, but the number and size of individual pits has not been delineated. Wastes at IRP-4 were predominantly grease wastes. An estimated 625,000 to 800,000 gallons of watered-down grease and an unknown quantity of other wastes were disposed between the early 1950s and 1983. IRP-17 is the southernmost pit, and it occupies approximately 2 acres. It reportedly operated for only a 2- to 3-year period, and was backfilled in the early 1970s (ABB-ES 1994).

Near IRP-3 is a helicopter crash site south of Lake Fretwell. An estimated 1,800 to 2,000 gallons of fuel were released when the helicopter crashed in February 1992. This site is included in the Tank Program.

IRP site 16 and AOIs 28, 29, 30, 31, 32, and 33 are located on the northwest edge of the proposed airfield, west of the existing runway. Maintenance and repair of aircraft in the adjacent hangars (Building Nos. 313, 815, and 825) generated various solvents, paints, greases and other hazardous materials/wastes that were historically disposed through a sump to a holding tank, and a seepage pit (IRP-16). A wash disposal area associated with Building No. 313, AOI-30, and hazardous waste collection points, AOI-28 and AOI-29, are categorized "grey" due to the potential for a spill or release to have occurred. The hangars are categorized "red" because they are within the IRP-16 plume, and the potential exists that contamination has occurred (ABB-ES 1994).

North of IRP-16 is the Jet Engine Test Cell Facility (Building Nos. 334, 339, and 811 or Test Cells 3, 4, and 5). Fuel for the test cells is located between Building Nos. 339 and 811 in a 5,000-gallon AST, and two 20,000-gallon USTs. This area is categorized "yellow" and is under the Tank Program due to fuel leaks from the tanks and numerous spills from overfilling (ABB-ES 1994). Other Tank Program sites in this development area include the South Tank Farm and Day Tank No. 1.

Where the proposed airfield facility extends to the south, a portion of Perimeter Road abuts the development area.

Parks and Recreation. Seven IRP sites and four of the original 16 AOIs are located in the area proposed for reuse for parks and recreation. IRP-15, the Blue 10 Ordnance Disposal Area, is located in the southwestern quadrant of the Yellow Water Area. An estimated 350 tons of ordnance were burned in a heavy metal tank at the site, and the ash and residual metals spread over an estimated 10-acre area (ABB-ES 1994). AOI-20 is a staging area for hazardous and nonhazardous wastes located adjacent to a permitted hazardous waste storage facility (Building No. 610) on "B" Street in the Yellow Water Area. (Building No. 610 is also categorized a "grey" area.)

Most of the land area in the southwest quadrant of the Yellow Water Area is categorized "white" or suitable for transfer. However, some areas of concern identified during the EBS include an abandoned wastewater treatment plant, an abandoned transportation facility, abandoned munitions magazines, and the former artillery range.

The remainder of the IRP sites/AOIs in the area proposed for parks and recreation are located in the Main Station. Three of the sites are located within the existing golf course,

including IRP-11 (Golf Course Pesticide Disposal Area), AOI-21 (Golf Course Maintenance Area), and AOI-22 (Golf Course Fairway 7 Disposal Area). Pesticides, pesticide containers, and other solid waste was disposed of at these sites. The entire 221-acre golf course, has been categorized as "grey," due to the past application of pesticides, herbicides, and nutrients, and the potential for these substances to affect adjacent waterways.

The other IRP sites surround Lake Fretwell, including two oil disposal areas (IRP-3 and IRP-5), grease pits (IRP-4), and two rubble disposal areas (IRP-6 and IRP-19). IRP-5 is located on the east side of Perimeter Road, and was used in the 1950s to dispose of waste fuel, oil, and PCB-containing fluids. The appearance of oil stains, lack of vegetation, and petroleum smells indicate that more recent use of the site has occurred (ABB-ES 1994). IRP-6 was originally a low-lying marshy area on the east side of Lake Fretwell, in which construction and demolition debris, concrete, lumber, tree clippings and scrap metal were dumped. IRP-19 is located on the west side of Rowell Creek extending south to the eastern shore of Lake Fretwell. It also served as a disposal area for various construction and demolition debris (ABB-ES 1994). Approximately 220 acres surrounding Lake Fretwell and the area north to 6th Street are categorized "grey" because the area adjoins IRP sites.

In addition, sections of Perimeter Road traverse the proposed park and recreational use on the north and west sides of the development area. Perimeter Road is considered one of the original 16 AOIs (AOI-35) due to the reported use of PCB-contaminated oil for dust suppression.

Of total the 2,332 acres proposed for park and recreation, approximately 21 acres are covered by known IRP sites.

Market-Driven Development. Two IRP sites and four of the original AOIs are located in the area proposed for market-driven development.

To the northwest is IRP-12, the Public Works Rubble Disposal Area, which was used for disposal of construction debris such as concrete, wood, and scrap metal. Near IRP-12 are three AOIs: 25, 26, and 27. AOI-25 is a site where several hundred transformers were stored; AOI-26, located within Building No. 81, was used to store and mix pesticides, including DDT. At AOI-27, 55-gallon drums of hazardous/nonhazardous waste were stored (ABB-ES 1994).

IRP-7, the old firefighting training area, is located at the southeast edge of the proposed market-driven development just north of the existing airfield runway. It consists of two burn pads on an asphalt apron, and one unlined burn pit in the grassy area north of the apron. Waste liquids (i.e., fuels, oils, solvents, paints and paint thinners) were drained onto

the burn pads or burn pit and ignited. Training crews would extinguish the fires with water and nontoxic foaming agents. The training area operated between the mid-1950s and 1975, when the burn pit was filled with soil (ABB-ES 1994).

Two housing areas are located within the area proposed for market-driven development. An area of family housing on the western edge area is categorized "grey" due to the presence of fuel oil USTs. The BEQ in the center of the development area is categorized "grey" due to the presence of asbestos.

Tank Program sites located in the area proposed for market-driven development include NFF, where numerous fuel spills have occurred in the past, and an aircraft crash site north of NFF.

4.11.4 Alternative Reuse Scenario 3

4.11.4.1 Hazardous Materials Management

Under ARS 3, various hazardous materials will be stored and used, and various types of hazardous wastes would likely be generated. Types of hazardous materials/wastes typical for these land uses and associated activities/processes are shown on Table 4-49. As stated under the Preferred Reuse Plan discussion (Section 4.11.1), existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure that no release of hazardous substances occurs that will impact human health or the environment.

4.11.4.2 Environmental Contamination

Development under ARS 3 will not be precluded by the remediation of sites within the IRP or under investigation to determine the need to remediate under the IRP. However, some development may be delayed, and possibly, specific uses precluded.

Whether and what type of development would be permitted on a former IRP site, AOI or other area of environmental contamination will be determined after the ROD on the RD/RA of the site. Supporting the ROD will be a Risk Assessment, evaluating where potential exposure would occur in the environment. Clean-up levels at the site will be as approved by EPA and FDEP. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property. However, none of the proposed land uses will be significantly impacted because of the vast area of development.

Table 4-56 lists the proposed land uses under ARS 3 by zone and the remedial priority of each zone. The following discussion highlights the IRP sites, the original AOIs, and other potentially significant areas of environmental contamination that may be precluded

Table 4-56

REMEDIAL ZONES FOR ARS 3

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
A	Yellow Water Weapons Area	14, 15	Manufacturing Light Industry Open Space	2
B	Golf Course and Residential	11	Non-Aviation/Incubator Parks and Recreation	5
C	Developed Non-Industrial	12	Business Park Non-Aviation/Incubator Parks and Recreation	3
D	Flightline Industrial Area	7, 16	Non-Aviation/Incubator Planned Residential Community Manufacturing	1
E	Jacksonville Heights		Commercial	7
F	Non-Developed West Area	1, 2, 3, 4, 5, 6, 9, 10, 17, 19	Manufacturing Parks and Recreation Non-Aviation/Incubator Conservation	8
G	Non-Developed South Area	8	Planned Residential Community Manufacturing Conservation	10
H	AVORD and Non-Developed East Area	18	Planned Residential Community	9
—	NAS Jacksonville - Cecil Field Jet Fuel Pipeline Commercial Boundary	—	—	4

Key at end of table.

Table 4-56

REMEDIAL ZONES FOR ARS 3

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
—	OLF Whitehouse Flightline	—	—	6
—	Palatka Radar Site	—	—	11

Key:

IRP = Installation Restoration Program.

Source: ABB-ES 1995; Arthur Andersen 1995.

from development within proposed land uses. Table 4-57 lists the IRP sites and AOIs by land use.

Light Industry. A portion of IRP-14, the Blue 5 Ordnance Disposal Area, is located in the area proposed for development as light industry. It is located in the Yellow Water Area, north of the YWWC. Over 10 years between the 1960s and 1970s, 30,000 to 45,000 pounds of ordnance was disposed of by detonation. Types of ordnance disposed include fuses, 100-pound bombs, large munitions, and explosive material (ABB-ES 1994).

No other known IRP or any of the original 16 AOIs are located in this proposed development area. Generally, the two northern quadrants of the Yellow Water Area are considered "white" or suitable for transfer. Isolated areas of "grey" categories include three dump sites northeast of the YWWC (ABB-ES 1994).

Manufacturing. Eight IRP sites and two AOIs are located in areas proposed for manufacturing, but much of the land area is categorized "white" or suitable for transfer. IRP-15 (the Blue 10 Ordnance Disposal Area) and AOI-20 (Hazardous Waste Storage Facility) are in the proposed manufacturing area. IRP-15 is located in the southeast quadrant of the Yellow Water Area. Ordnance was burned in a heavy metal tank located at the site, and the residual ashes and metals spread over the grounds. The site is categorized as "yellow," because remedial actions have been initiated at the site (ABB-ES 1994).

Building No. 610 is a permitted hazardous waste storage facility in the Yellow Water Area, and AOI-20 is located adjacent to it. Hazardous and nonhazardous wastes were reportedly stored in an area adjacent to Building No. 610, and it is categorized "grey" (as is Building No. 610). Other areas of concern identified in the Yellow Water Area include an abandoned wastewater treatment plant, sludge drying beds, an abandoned transportation maintenance facility, abandoned munitions magazines, and the former artillery range (ABB-ES 1994).

The area in the Main Station proposed for manufacturing is categorized largely "white" on the west side of Perimeter Road, and "grey/white" on the east side of Perimeter Road, which is designated as AOI-35.

IRP sites 2, 3, 4, 8, 9, 10 and 17 are located on the east side of Perimeter Road. IRP 2 is a former base landfill located at the southwest edge of the development area that operated between 1965 and 1975. Trenches were cut along a 600-foot east/west alignment. When the trench was filled, another was cut. IRP sites 3, 4, 9, and 17 were used to dispose of oils, solvents, paints, and greases from various operations at the base. IRP-8 is located

Table 4-57

IRP SITES/AOIs WITHIN LAND USE CATEGORIES FOR ARS 3

Land Use	IRP Sites/AOIs
Business Park	IRP-12 Public Works Rubble Disposal Area AOI-35 PCBs on Perimeter Road
Light Industry	IRP-14 Blue 5 Ordnance Disposal Area
Parks and Recreation	IRP-5 Oil Disposal Area IRP-4 Grease Pits IRP-6 Lake Fretwell Rubble Disposal Area IRP-11 Golf Course Pesticide Disposal Area IRP-19 Rowell Creek Rubble Disposal Area AOI-21 Golf Course Maintenance Area AOI-22 Golf Course Fairway 7 Area AOI-35 PCBs on Perimeter Road
Manufacturing	IRP-2 Recent Landfill IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-8 Bore Site Range/Hazardous Waste Storage Area/Firefighting Training IRP-9 Recent Grease Pits IRP-10 Rubble Disposal Area IRP-15 Blue 10 Ordnance Disposal Area IRP-17 Oil/Sludge Disposal Pit Southwest AOI-20 Hazardous Waste Storage Facility AOI-35 PCBs on Perimeter Road
Non-Aviation/Incubator	IRP-7 Old Firefighting Training Area IRP-16 AIMD Seepage Pit AOI-25 Transformer Storage Yard AOI-26 Building 81 DDT Site AOI-27 Building 81 HAZMAT Shed AOI-28 North TCP Site AOI-29 Building 313 TCP Site AOI-30 Building 313 AOI-31 South TCP Site AOI-32 Supply Building 335 HAZMAT Storage Area AOI-33 DRMO Storage Area AOI-35 PCBs on Perimeter Road
Planned Residential	IRP-18 Ammunition Disposal Area AOI-23 Aviation Ordnance Area (AVORD) Site AOI-24 AVORD Pistol Range Site AOI-35 PCBs on Perimeter Road
Open Space	IRP-14 Blue 5 Ordnance Disposal Area
Commercial	None
Conservation	IRP-1 Old Landfill IRP-10 Rubble Disposal Area AOI-34 Rowell Creek Ordnance Disposal Area AOI-35 PCBs on Perimeter Road

Source: Ecology and Environment, Inc. 1996.

within the boresite range, and was used for hazardous waste storage and also firefighting activities. IRP-10 is a rubble disposal area, which is located on the east side of Rowell Creek in the southwestern portion of the development area. IRP-10 extends between two development areas; the southern part of IRP-10 extends into the proposed conservation area.

All IRP sites in the southwestern section of the development area are categorized "red" because remedial actions are underway. However, the land area surrounding the IRP sites is categorized "grey" because the extent of contaminant migration requires further investigation (ABB-ES 1994).

Other areas of concern identified during the EBS include the sludge disposal field from the station's wastewater treatment plant, the jet engine "run-up" area, and a retention basin used to capture fuel spills from the runway. The airfield is considered a "grey" area because of known and suspected fuel spills, and the proposed manufacturing development area extends over the western runway (9R-27L). The location of a 1992 helicopter crash is located near IRP-3.

Open Space. The land area proposed for use as open space is generally categorized "white" or suitable for transfer, with the exception of the YWWC. The YWWC has been categorized as a "grey" area. Further investigation is required to determine whether environmental contamination is a concern due to the previous use of munitions and weapons in the area. IRP-15, the Blue 5 Ordnance Disposal Area, extends into the proposed open space area at the north. (IRP-15 was discussed previously under the proposed light industrial development.)

Planned Residential. The land area proposed for a planned residential community is categorized "white/grey" and contains several sites of known or potential environmental contamination. The development area east of Sal Taylor Creek is suitable for transfer, with the exception of IRP-18, portions of Perimeter Road, and unidentified earthen mounds. IRP-18, a historic ammunition disposal area, is located in the southeast corner of the proposed development area.

AOI-23, AOI-24, and several areas of concern identified during the EBS are located west of Rowell Creek. AOI-23 is an area behind Building 25 suspected of contamination from munitions and weapons loading operations in the building. AOI-24 is north of the AVORD Pistol Range Site. Because the original range was open, AOI-24 is suspected of containing concentrations of discharged lead bullets (ABB-ES 1994).

Most of the airfield, which extends partially into the western edge of the planned residential community, is categorized "grey" due to the known or suspected releases of petroleum products. Two major spills (497,000 gallons in 1981 and 900,000 gallons in 1991) migrated through the drainage system to Sal Taylor Creek, and other minor spills are believed to have been contained within the airfield complex. Also observed northeast of the airfield were areas of stressed vegetation, metal debris, 55-gallon drums, petroleum smells, and rust-colored foam on a stream.

Conservation. IRP-1 (the old base landfill) and IRP-10 (a rubble disposal area) are located at the northeastern edge of the proposed conservation area. AOI-34, where ordnance was reportedly disposed of from the bridge into Rowell Creek, is also in the vicinity. Some of the contaminant plume "grey" area, which is associated with the IRP sites northeast of the proposed conservation area, extends south into the proposed conservation area. AOI-35, Perimeter Road, encircles the conservation area. However, most of the area proposed for conservation at the south end of NAS Cecil Field is "suitable for transfer." Sal Taylor Creek, traverses the north end of the proposed development area, and the creek is categorized "green." Large fuel spills from NFF have migrated into Sal Taylor Creek, but the contamination is not at concentrations that warrant a remedial action or removal. Therefore, it is considered suitable for transfer (ABB-ES 1994).

Business Park. The area proposed for use as a business park is generally categorized "white," or suitable for transfer. However, one IRP site and two FDEP Petroleum Program sites are located within the boundaries of the proposed business park. IRP-12, a 0.5-acre rubble disposal area, is located in the southwest portion of the development area. Most of the debris, including concrete, wood, wire, cable, and scrap metal is buried 3 feet below the surface, with some rubble present aboveground. Two Tank Program sites, NFF and a crash site located along "A" Avenue, are on the eastern edge of the proposed development. An S-3 aircraft crashed in December 1991, and debris was spread over 65-foot by 200-foot area. Numerous fuel spills have occurred at NFF, including a 900,000-gallon spill in 1991 (ABB-ES 1994). In addition, a section of Perimeter Road (AOI-35) crosses the north end of the proposed development area.

Non-Aviation/Incubator. IRP sites 7 and 16, and AOIs 25, 26, 27, 28, 29, 30, 31, 32, and 33 are located in the area proposed for use as non-aviation development/business

incubator. IRP-7, the old firefighting training area, is located northeast of the runway, in the southeast portion of the proposed development area.

IRP-16 and AOIs 28, 29, and 30 are located at the western edge of the proposed development, which is associated with the maintenance hangars, Building Nos. 313, 815, and 825. Various solvents, paints, greases, and other hazardous materials/wastes were historically discharged through a sump to a holding tank, and a seepage pit (IRP-16). A wash disposal area associated with Building No. 313 (AOI-30) and two hazardous waste collection points (AOIs 28 and 29) are categorized "grey" due to the potential for a spill or release to have occurred. The hangars are categorized "red" because they are within the IRP-16 plume, and the potential exists that contamination has occurred (ABB-ES 1994). At the Jet Engine Test Facility, North of IRP-16, remedial action is underway through the FDEP Petroleum Program. Contamination has occurred from leaks and overspills from two 20,000-gallon USTs and one 5,000-gallon AST that supplied fuel to the test engine cells. Day Tank 1, another Tank Program site, is south of IRP-16. This 200,000-gallon tank distributed JP-5 from the North Fuel Tank to the high-speed refuelers located on the flightline. Spills and releases have occurred in the past, and the site is under remediation (ABB-ES 1994).

Many of the buildings in the proposed development area are categorized "grey" for various reasons. A large housing complex in the northwest is categorized "grey" due to the fuel oil storage tanks; and a large housing complex in the center of the development is categorized "grey" due to the presence of asbestos. The TFM compound (old and new filling stations), consisting of Building Nos. 49, 80, 80C, 178, 180, 384, and 584, was categorized "red" during the EBS because of known releases of petroleum products, the storage/handling of hazardous materials and petroleum products, and storm water flow to an unlined retention basin (ABB-ES 1994).

AOIs 25, 26, and 27 are located near 9th Street and "B" Avenue at the north end of the development area. AOI-25 is the location for storage of several hundred transformers. AOI-26 is an area within Building No. 81, where pesticides, including DDT, were stored and mixed. AOI-27 is an area used for storage of hazardous/non-hazardous waste in 55-gallon drums. A portion of AOI-35, Perimeter Road, crosses the northern edge of the area proposed as a non-aviation business incubator.

Parks and Recreation. Five IRP sites and three AOIs are located in the area proposed for redevelopment by the City of Jacksonville Parks and Recreation Department. Several of the sites are located within the existing golf course, including IRP-11 (Golf Course Pesticide Disposal Area), AOI-21 (Golf Course Maintenance Area), and AOI-22 (Golf Course

Fairway 7 Disposal Area), areas where pesticides, pesticide containers and other solid waste was disposed. The 221-acre golf course has been categorized as "grey" due to the past application of pesticides, herbicides, and nutrients and the potential for these substances to affect adjacent waterways.

The other IRP sites surround Lake Fretwell, and include an oil disposal area (IRP-5), grease pits (IRP-4) and two rubble disposal areas (IRP-6 and -19). Approximately 220 acres surrounding Lake Fretwell are categorized "grey" because the area adjoins IRP sites. In addition, sections of Perimeter Road traverse the proposed park and recreational use on the north and west sides of the development area.

Other. No IRP sites/AOIs or other significant areas of environmental concern are located in portions of the station proposed for redevelopment for commercial uses.

4.11.5 Alternative Reuse Scenario 4

4.11.5.1 Hazardous Materials Management

Under ARS 4, various hazardous materials will be stored and used, and various types of hazardous wastes will likely be generated. Types of hazardous materials/wastes typical for these land uses and associated activities/processes are shown on Table 4-49. As stated under the Preferred Reuse Plan discussion (Section 4.11.1), existing hazardous material and hazardous waste management regulations in Florida will be followed to ensure no release of hazardous substances occurs that will impact human health or the environment.

4.11.5.2 Environmental Contamination

Development under ARS 4 will not be precluded by the remediation of sites within the IRP or under investigation to determine the need to remediate under the IRP. However, some development may be delayed, and possibly specific uses precluded.

Whether and what type of development would be permitted on a former IRP site, AOI, or other area of environmental contamination will be determined after the ROD on the RD/RA for the site. Supporting the ROD will be a Risk Assessment, evaluating where potential exposure would occur in the environment. Clean-up levels at the site will be as approved by EPA and FDEP. Any restrictions on development will be incorporated into the FOSL or FOST, and the lease or deed for the property. However, none of the proposed land uses will be significantly impacted because of the vast area of developable land.

Table 4-58 lists the proposed land uses under ARS 4 by zone and the remedial priority of each zone. The following discussion highlights the IRP sites, the original AOIs, and other potentially significant areas of environmental contamination that may be precluded from development within proposed land uses. Table 4-59 lists the IRP sites and AOIs by land use.

Light Industry. No IRP sites or AOIs are located in areas proposed for light industry. The eastern half of the Yellow Water Area is largely undeveloped, and no areas of environmental concern were identified during the EBS (ABB-ES 1994). Therefore, the land area is categorized "white" or suitable for transfer. A small section of light industrial use is proposed on the far western edge of the Main Station, and no IRP sites, AOIs, or other areas of environmental concern have been identified.

Heavy Industry. The area proposed for heavy industrial use under ARS 4 is the same as under the Preferred Reuse Plan. Refer to Section 4.11.1.1 for a discussion of the IRP sites/AOIs and other areas of potential environmental contamination in this development area.

Forestry/Airport Reserve. The area proposed for forestry/airport reserve under ARS 4 is the largely the same as under the Preferred Reuse Plan. Refer to Section 4.11.1.1 for a discussion of the IRP sites/AOIs and other areas of potential environmental contamination in this development area. ARS 4 differs slightly from the Preferred Reuse Alternative at the far western section of the Main Station. ARS-4 proposes forestry/airport reserve in an area where the Preferred Reuse Plan proposes forestry. However, no IRP sites, AOIs, or other areas of environmental concern are located in this area.

State Corrections Facility. The area proposed for use as a state corrections facility is located in the YWWC, and extends to the north of the YWWC. One IRP site, IRP-14, is located at the north end of the proposed development area. IRP-14 is an ordnance disposal area, approximately 4.5 acres in size. Between 1967 and 1977, an estimated 30,000 to 45,000 pounds of ordnance were disposed at this site through open detonation. YWWC, has been categorized as a "grey" area during the EBS because of concern that environmental contamination may have occurred due to past munitions use in the area.

Table 4-58

REMEDIAL ZONES FOR ARS 4

Zone	Zone Boundary	IRP Sites	Proposed Reuse	Investigative Priority
A	Yellow Water Weapons Area	14, 15	Forestry Parks and Recreation Heavy Industry State Corrections Facility Juvenile Justice Facility Light Industry Commercial	2
B	Golf Course and Residential	11	Heavy Industry Parks and Recreation	5
C	Developed Non-Industrial	12	Heavy Industry Aviation-Related Services Parks and Recreation	3
D	Flightline Industrial Area	7, 13, 16	General Aviation Aviation-Related Services	1
E	Jacksonville Heights		Light Industry Commercial	7
F	Non-Developed West Area	1, 2, 3, 4, 5, 6, 9, 10, 17, 19	Light Industry Forestry/Airport Reserve Parks and Recreation General Aviation Aviation-Related Services	8
G	Non-Developed South Area	8	Forestry/Airport Reserve Conservation	10
H	AVORD and Non-Developed East Area	18	Forestry/Airport Reserve General Aviation	9
—	NAS Jacksonville - Cecil Field Jet Fuel Pipeline Commercial Boundary	—	—	4
—	OLF Whitehouse Flightline	—	—	6
—	Palatka Radar Site	—	—	11

Key:

IRP = Installation Restoration Program.

Source: ABB-ES 1995; Arthur Andersen 1995.

Table 4-59

IRP SITES/AOIs WITHIN LAND USE CATEGORIES FOR ARS 4

Land Use	IRP Sites/AOIs
Forestry	None
Light Industry	None
Parks and Recreation	IRP-4 Grease Pits IRP-5 Oil Disposal Area IRP-6 Lake Fretwell Rubble Disposal Area IRP-15 Blue 10 Ordnance Disposal Area IRP-11 Golf Course Pesticide Disposal Area IRP-19 Rowell Creek Rubble Disposal Area AOI-20 Hazardous Waste Storage Facility AOI-21 Golf Course Maintenance Area AOI-22 Golf Course Fairway 7 Area AOI-35 PCBs on Perimeter Road
Heavy Industry	IRP-12 Public Works Rubble Disposal Area AOI-25 Transformer Storage Yard AOI-26 Building 81 DDT Site AOI-27 Building 81 HAZMAT Shed AOI-35 PCBs on Perimeter Road
Aviation Related Services	IRP-16 AIMD Seepage Pit AOI-28 North TCP Site AOI-29 Building 313 TCP Site AOI-30 Building 313 AOI-31 South TCP Site AOI-32 Supply Building 335 HAZMAT Storage Area AOI-33 DRMO Storage Area AOI-35 PCBs on Perimeter Road
General Aviation	IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-7 Old Firefighting Training Area IRP-17 Oil/Sludge Disposal Pit Southwest AOI-35 PCBs on Perimeter Road
Forestry/Airport Reserve	IRP-1 Old Landfill IRP-2 Recent Landfill IRP-3 Oil/Sludge Disposal Pit IRP-4 Grease Pits IRP-8 Bore Site Range/Hazardous Waste Storage Area/Firefighting Training IRP-9 Recent Grease Pits IRP-10 Rubble Disposal Area IRP-17 Oil/Sludge Disposal Pit Southwest IRP-18 Ammunition Disposal Area AOI-23 Aviation Ordnance Area (AVORD) Site AOI-24 AVORD Pistol Range Site AOI-34 Rowell Creek Ordnance Disposal Area AOI-35 PCBs on Perimeter Road
State Correctional Facility	IRP-14 Blue 5 Ordnance Disposal Area
Commercial	None
Conservation	None
Juvenile Justice Facility	None

Source: Ecology and Environment, Inc. 1996.

General Aviation. The area proposed for general aviation under ARS 4 is similar as under the Preferred Reuse Plan, except that it includes portions of IRP-3 and IRP-4. Refer to Section 4.11.1.1 for a discussion of the IRP sites/AOIs and other areas of potential environmental contamination in this development area.

Parks and Recreation. The area proposed for parks and recreation under ARS 4 is the largely the same as under the Preferred Reuse Plan. (Refer to Section 4.11.1.1 for a discussion of the IRP sites/AOIs and other areas of potential environmental contamination in this development area.) ARS 4 differs slightly from the Preferred Reuse Alternative at the northern end of the proposed development area in the Yellow Water Area. The section west of the YWWC is narrower than under the Preferred Reuse Plan, but extends farther north. However, no IRP sites, AOIs, or other areas of environmental concern are located in this area.

Aviation Related Services. The area proposed for aviation related services under ARS 4 is the same as under the Preferred Reuse Plan. Refer to Section 4.11.1.1 for a discussion of the IRP sites/AOIs and other areas of potential environmental contamination in this development area.

Other. No IRP sites/AOIs or other significant areas of environmental concern are located in portions of the station proposed for redevelopment as commercial, forestry, conservation, or a juvenile justice facility.

4.11.6 Cumulative Impacts

Other than actions associated with the closure of NAS Cecil Field, there are no significant past or reasonably foreseeable future actions that could cumulatively affect environmental contamination at or around NAS Cecil Field. As part of the EBS, a survey was conducted to identify potential past releases of contaminants on properties adjacent to the station (see Section 3.11.14) (ABB-ES 1994). Although the survey identified five properties where releases occurred, none of these would cumulatively affect remedial actions planned at the station (ABB-ES 1995).

Overall, closure of NAS Cecil Field and implementation of the Preferred Reuse Plan would result in cumulative beneficial impacts. To facilitate reuse of the station for economic development, the Navy has significantly accelerated its IRP actions, so that contaminated

areas will be addressed much sooner than would be the case under normal operating conditions.

4.11.7 Mitigation Measures

Hazardous Materials and Waste Management. All process units at NAS Cecil Field, including 31 temporary collection points and three satellite accumulation areas, will be decontaminated and/or closed within 90 days of process shutdown in compliance with the RCRA (40 CFR 250).

The hazardous waste storage facility, Building No. 610, will be closed in compliance with the RCRA (40 CFR 260-269) consistent with the RCRA Part B Permit.

Installation Restoration Program. All IRP sites will be investigated and remediated to facilitate early transfer of property. Strategies for "fast-track cleanup" include: compressed schedules; improved communication between the Navy, regulatory agencies, and other parties; elimination of redundant actions; and increasing concurrent activities.

Storage Tanks and Pipelines. All tanks suitable for reuse under the Preferred Reuse Plan or other alternatives will be brought into compliance with the FAC Chapters 62-761 and 62-762. The Tank Management Plan outlines the timetable for investigation, removal and cleanup or upgrade for regulatory compliance.

The FDEP Petroleum Program currently is remediating five sites. The Navy and the State of Florida have signed an agreement governing the site clean-up criteria and schedule. Each site requires that a site management plan be updated annually.

Information on the location and status of all USTs/ASTs will be provided to property transferees.

Lead and Copper in Drinking Water. No concerns were identified for lead and copper in the drinking water; therefore, no mitigation or any further action is required.

Oil/Water Separators. Oil/water separators will be closed as RCRA-regulated process units. The area surrounding the oil/water separators will be screened for constituents of concern. If contamination is identified, these sites will be addressed under the IRP (if non-petroleum-related) or the Tank Management Program (if petroleum-related).

Asbestos. The Navy will provide all property transferees information on the existence, extent, and condition of ACM at NAS Cecil Field with the property transfer documents. Such information will include: type and location of ACM; results of any testing; description of asbestos control measures; any cost estimates; and any inventory updates.

All ACM that was determined to be a threat to human health (i.e., damaged, friable and accessible) will be abated prior to base closure, unless specific conditions are met by the transferee. If the transferee plans to demolish the building, and agrees in a transfer agreement to prohibit occupation of the building prior to demolition and to assume responsibility for the management of the ACM, the Navy will not conduct abatement.

Lead-Based Paint. In accordance with Title X of the Residential Lead-Based Paint Hazard Reduction Act, all lead-based paint hazards will be abated for buildings constructed before 1960 that could potentially be reused for purposes involving children (e.g., residential buildings, day-care centers, recreation buildings), unless the building is scheduled for demolition or the transferee agrees to abate according to applicable regulations. For buildings constructed from 1960 to 1978, the Navy will provide the results of the lead-based paint survey to transferees. A statement will be included in the deed; however, abatement is not required.

PCBs. All regulated PCB-containing transformers have been removed or replaced. PCB-related hazardous waste sites are being addressed under the IRP. No mitigation or any further action is required.

Pesticides. No closure actions are required for pesticide use. All pesticides will be removed from the site prior to base closure. All pesticide storage areas and disposal sites have been investigated, and are addressed under the IRP.

Medical and Biohazardous Waste. Medical and biohazardous waste will not be generated after closure of the medical and dental clinics on base. Therefore, no mitigation or further action is required.

Ordnance. Unexploded ordnance surveys have been completed at IRP sites 14, 15, and 18, and at AOI-34. Ordnance identified was excavated and removed. Further remediation of these sites will be conducted under the IRP. No mitigation or any further action is planned.

Radioactive Materials and Mixed Waste. No concerns were identified for radioactive materials or mixed waste at NAS Cecil Field; therefore, no mitigation or further action is required.

Radon. No concerns were identified for radon contamination; therefore, no mitigation or further action is required.

4.12 Environmental Justice

Consistent with the Executive Order 12898 of February 11, 1994, it is the Navy's policy to identify and address disproportionately high and adverse human health or environmental effects of actions on minority and low-income populations. This policy states that the Navy shall:

- Ensure that all programs or activities under its control receiving federal financial assistance and that affect human health or the environment do not directly or indirectly use criteria, methods, or practices that discriminate on the basis of race, color, or national origin;

- Analyze the human health, economic, and social effects of Department of the Navy actions, including effects on minority communities and low-income communities, when such analysis is required under NEPA;

- Ensure that whenever feasible, mitigation measures outlined or analyzed in the environmental impact statement, or Record of Decision (ROD), address significant and adverse environmental effects of proposed federal actions on minority communities and low-income communities;

- Ensure that opportunities for community input in the National Environmental Policy Act process are provided, including identifying potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices; and

- Ensure that the public, including minority communities and low-income communities, has adequate access to public information relating to human health or environmental planning, regulation, and enforcement.

All criteria, methods, and practices utilized in the preparation of this DEIS to evaluate the significance of impacts resulting from the reuse scenarios developed by CFDC were based on scientific and technical methodologies, and they do not discriminate either

directly or indirectly on the basis of race, color, or national origin. All methods of data collection, analyses, and evaluation utilized are widely accepted and are unbiased scientific and technical practices.

The purpose of this DEIS is to address potential environmental, social, and economic impacts associated with the disposal of NAS Cecil Field and subsequent reuse of the property pursuant to the reuse scenarios prepared by CFDC. Minority and low-income communities will not be disproportionately affected by the proposed action.

NAS Cecil Field is located in the Duval and Clay counties. None of the areas directly contiguous with the station are considered to be minority or low-income neighborhoods. The neighborhoods directly adjacent to the facility are delineated by the 1990 Census of Population and Housing and include census tracts 137.21, 137.22, 137.98 located in Duval County, and Census Tracts 301.00 and 302.00 located in Clay County.

Based on 1990 census tract information and definitions utilized by HUD, these tracts, while diverse, are not predominantly (i.e., greater than 50%) minority or low-income. Table 4-60 shows the percentage of minority and low-income residents living in census tracts adjacent to NAS Cecil Field. Approximately 2.6% to 14.8% of the total households in these census tracts are minority households. Approximately 19.7% to 30.8% of total households in these census tracts are low-income households.

Because none of the neighborhoods adjacent to NAS Cecil Field is a minority or low-income area, none of the proposed ARSs would disproportionately affect minority or low-income neighborhoods surrounding the station. In addition, the large majority of impacts associated with reuse of NAS Cecil Field would not be significant when compared to pre-closure conditions.

As discussed in Section 1, ample opportunity for community input into the preparation of this DEIS was provided. CFDC held several meetings in Jacksonville area, and the Navy held a public informational meeting/scoping meeting on February 9, 1995. In addition to extensive media coverage of the Preferred Reuse Plan, both CFDC and the Navy have conducted public mailings which included civic leagues, planning district commissions, and public interest groups representing minority and low-income populations. The Navy has provided and will continue to provide ample opportunity for all individuals and groups to participate in the reuse planning process and NEPA processes. The DEIS was distributed to all interested agencies and those individuals who requested a copy.

Table 4-60

MINORITY AND LOW-INCOME STATUS OF RESIDENTS LIVING IN CENSUS TRACTS ADJACENT TO NAS CECIL FIELD[a]

Census Tract	Total Residents	White	Black	American Indian	Asian	Other	Hispanic Origin	Percent Minority	Percent of Households Considered Low-Income[a]
137.21	2,838	2,703	89	15	24	7	50	6.5	29.7
137.22	9,771	8,547	738	39	362	85	226	14.8	19.7
137.98	3,897	3,823	44	11	11	8	28	2.6	27.2
301.00	10,960	10,539	296	48	52	25	97	4.7	30.8
302.00	6,100	5,899	81	26	36	58	89	4.8	20.5

[a] Low-Income households defined at those earning less than two-thirds the county median household income.

Source: U.S. Bureau of the Census 1992.

5 Relationship of the Proposed Action to Federal, State, and Local Plans, Policies, and Controls

5.1 Applicable Statutes and Regulations

The following applicable statutes and regulations have been considered in the development of this DEIS.

- Base Closure and Realignment Act of 1990 (Title XXIX of P.L. 101-510 as amended by P.L. 102-190 and P.L. 102-484);
- President Clinton's Five-Part Plan, "A Program to Revitalize Base Closure Communities";
- The National Defense Authorization Act for Fiscal Year 1994; Title XXIXA—Base Closure Community Assistance (P.L. 103-160);
- Department of Defense Final Rule, 30 CFR Parts 90 and 91: "Revitalizing Base Closure Communities and Community Assistance";
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations;
- Deputy Secretary of Defense Memorandum, "Fast Track Cleanup at Closing Installations";
- Stewart B. McKinney Homeless Assistance Act (42 U.S.C. 11301, *et seq.*);
- National Environmental Policy Act (42 U.S.C. 4321, *et seq.*) and implemented by 40 CFR 1508.8 - 1508.14;
- Clean Water Act (33 U.S.C. 1251, *et seq.*) as implemented by 33 CFR 323;
- Endangered Species Act (16 U.S.C. 1531, *et seq.*) as implemented by 50 CFR 17 *et seq*;

- Fish and Wildlife Coordination Act (16 U.S.C. 661, *et seq.*);
- Clean Air Act (42 U.S.C. 7401, *et seq.*) as implemented by 40 CFR Parts 6, 51, and 93;
- National Historic Preservation Act (16 U.S.C. 470(f)) as implemented by 36 CFR Part 800;
- Navy Guidance Provided by OPNAVINST 5090.1B;
- Executive Order 11988, Floodplain Management, as amended by Executive Order 12148, dated July 20, 1979;
- Executive Order 11990, Protection of Wetlands, dated May 24, 1977;
- Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451, *et seq.*);
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601, *et seq.*);
- Resource Conservation and Recovery Act (42 U.S.C. 6901, *et. seq.*) as implemented by 40 CFR 124;
- Local Government Comprehensive Planning and Land Development Act;
- Florida Development of Regional Impact Program;
- Florida Defense Conversion and Transition Act;
- Florida Coastal Management Program;
- Florida Hazardous Waste Management Act;
- Florida Standards for Storm Water Management and Sediment Reduction;
- Jacksonville Land Development Regulations;
- Jacksonville 2010 Comprehensive Plan;
- Clay County Land Development Regulations; and
- Clay County Comprehensive Plan.

5.2 Federal Regulatory Consistency Overview

This DEIS has been prepared in compliance with BRAC, NEPA, OPNAVINST 5090.1B, Deputy Secretary of Defense Memorandum "Fast-Track Cleanup at Closing

Installations", and Title XXIX of the National Defense Authorization Act for Fiscal Year 1994; the U.S. Department of Defense Final Rule for 30 CFR 90 and 91, which requires preparation of an EIS, specifies that environmental impacts of the proposed action and alternatives to the proposed action be evaluated, provides guidance for defining the proposed action as the disposal of property and redevelopment according to a local redevelopment plan or reasonable assumptions as to the likely reuse scenarios and their reasonable alternatives.

Also, in compliance with the President's Five-Part Plan, Title XXIX of the National Defense Authorization Act for Fiscal Year 1994, the U.S. Department of Defense Final Rule for 30 CFR 90 and 91, and the Stewart B. McKinney Homeless Assistance Act, redevelopment of the NAS Cecil Field property for jobs creation and/or homeless assistance has been considered as part of the property disposal process. The DEIS will be distributed for comment to all appropriate federal, state, and local agencies, organizations, and interested persons.

In compliance with the Clean Water Act and Executive Order 11990, development in wetland areas would be minimized to the extent practical. Approvals or USACE permits for wetland alteration would be required to be obtained by redevelopers prior to construction. In addition, all development affecting wetlands will be consistent with the "no net loss" of wetlands policy in the *Jacksonville Comprehensive Plan*. Also in compliance with the Clean Water Act, appropriate federal and local permits would be obtained by redevelopers to accommodate any future wastewater discharges resulting from station redevelopment.

In compliance with the Endangered Species Act and the Fish and Wildlife Coordination Act, appropriate federal and state agencies were contacted to determine the potential for the proposed action to impact threatened or endangered species and fish and wildlife habitat (see Section 4.3 of this DEIS). In addition, in accordance with Section 7 of the Endangered Species Act, a Biological Assessment was prepared that documents the effects of the proposed action on species of concern, and it will be reviewed by USFWS (see Appendix D).

The rules guiding the determination of conformance of an action with the Clean Air Act (CAA) of 1970, 42 USC 7401 *et seq.*, amended 1977 and 1990, are set forth in 40 CFR Parts 6, 51, and 93. Because the proposed action entails disposal of NAS Cecil Field and transfer of the land to other parties, it is exempt from the General Conformity Rule. However, because Duval County is designated as a maintenance area for ozone, an analysis of the projected emissions of ozone precursor chemicals (VOCs and NO_X) was conducted. Analyses in this DEIS indicate that ozone precursor emissions will decrease compared to pre-closure emissions. Therefore, the action conforms with the Florida SIP. Although emissions of other criteria pollutants (i.e., CO and PM) would slightly increase as a result of traffic and

construction associated with redevelopment activities, these emissions are not considered significant and would not affect Duval County's attainment designation for these pollutants. Compliance of future development/redevelopment projects at the former station property with applicable air quality regulations would be the responsibility of Jacksonville RESD and the ultimate receiving entity or redevelopers.

In compliance with the NHPA, appropriate federal, state, and local agencies were contacted regarding the potential for the proposed action to impact cultural resources of historical or archaeological significance. Sixteen archaeologically sensitive areas (i.e., areas with greater than average probability of containing prehistoric sites) have been identified at NAS Cecil Field in a cultural resource assessment. FDHR has accepted the conclusions of the assessment. Any future development that may affect these resources will be undertaken pursuant to a Programatic Agreement that has been negotiated between the Navy and the Florida DHR (see Appendix E).

In compliance with Executive Order 11988 and the CZMA of 1972, the proposed action will not involve any new construction in a floodway or flood hazard areas.

In compliance with CERCLA, RCRA, CERFA, and the Deputy Secretary of Defense Memorandum, an EBS has been completed. FOSLs or Findings of Suitability to Transfer (FOSTs) will be prepared, stating that the property is suitable for lease or transfer without restrictions or outlining the proposed restrictions on the future use of the property. In addition, deeds prepared for transfer will state that the Navy will be responsible for corrective measures found to be necessary after the date of transfer and provide clauses granting the Navy access to the property to conduct such corrective actions.

5.3 State Regulatory Consistency Overview

The Florida Defense Conversion and Transition Act (DCTA) passed by the 1994 Florida Legislature as amendments to Chapter 288, Florida Statute (FS), enables local governments to file a single application using the federal EIS and a base reuse plan to satisfy Florida's growth management requirements. The single application satisfies the local comprehensive plan amendment process under the Local Government Comprehensive Planning and Land Development Act, Part II Chapter 163 FS, and the Development of Regional Impact (DRI) program under Chapter 380, F.S.

The Content Requirements of Military Base Reuse Plans under DCTA Section 288.97 FS, include a plan element, five-year facility plans, and plan support information.

- **Plan Elements:** Plan elements include future land use, transportation (all types), housing, general infrastructure, intergovernmental coordination, capital improvements, coastal management, recreation and open space and conservation. These are the required elements of the comprehensive plan process under Chapter 163 FS.

- **Five-Year Facility Plans:** Military reuse plans are required to identify the need for and plans for the provisions of the following facilities and services for the next five years: roads, public transportation, drainage, potable water, solid waste sanitary sewer, and recreation and open space.

- **Plan Support Information:** Provides data and analysis on which the reuse plan was based, and includes, at a minimum: characteristics of vacant land, projected population growth, existing and projected public facilities, projected impact to on-site and off-site public facilities and services listed in paragraph B, projected use of vacant land and redevelopment of developed lands, and projected impacts of base reuse activities on natural resources.

The plan elements are required to meet the criteria under Rule 9J-5 of the Florida Administrative Code (FAC), which specifies the minimum criteria for review of local comprehensive plans and determination of compliance.

The Final Cecil Field Base Reuse Plan must also be consistent with the State Comprehensive Plan and the Regional Policy Plan as enacted in 1984 under the State and Regional Planning Act, Chapter 186 FS. The regional plan links the state plan with the local plan. By rule, the goals included in the State Comprehensive Plan must be addressed and regionalized into the regional and local plans. Polices of the of the regional plan and local plan must be consistent with each other and further the goals of the State Plan.

Furthermore, pursuant to the CZMA, State of Florida adopted the Florida Coastal Management Program (FCMP), which was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1981. Approval by NOAA empowers the state to review federal activities to ensure that these activities are in compliance with the state's approved management program. This review authority is referred to as federal consistency. The FCMP consists of a network of 28 Florida statutes administered by 11 state agencies and four of the five water management districts. Consistency with these statutes will constitute consistency with the FCMP. This DEIS will be circulated to various state agencies to support the consistency determination.

In compliance with the Florida Hazardous Waste Management Act, all clean activities have been coordinated with the FDEP as a member of the BRAC Cleanup Team.

In accordance with the Florida Standards for Storm Water Management and Sediment Reduction, new development occurring at the station property would require appropriate measures to prevent soil erosion during construction and to accommodate storm water drainage after construction. Each developer or projects would be required to obtain appropriate state permits ensuring conformance with these standards.

5.4 Local Regulatory Consistancy Review

Once the Final Base Reuse Plan is approved and adopted as an amendment to the local comprehensive plans (City of Jacksonville and Clay County), subsequent changes would be implemented, amended, and reviewed in accordance with the provisions of Part II, Chapter 163 FS and other applicable state statutes and administrative codes. Following approval of the comprehensive plan amendments on the Cecil Field property, zoning districts will need to be amended to be consistent with the land use designation of the comprehensive plan. Eventual implementation of the plan would be guided by the local land development regulations (LDR) adopted in accordance with Chapter 163 FS and Rule 9J-24 FAC.

The LDRs guide the physical characteristics of site development through procedural requirements, design criteria, application reviews and approvals, and permit issuance. The development review process (for Jacksonville and Clay County) would include a comprehensive plan, zoning, and concurrency consistency determination; subdivision and/or site plan approval; and permit approval. Permits may be required from, but are not limited to the local government, water management district, and Florida's Health and Rehabilitative Services. Applicable LDRs for the city of Jacksonville include:

- Chapter 656 Zoning Code;
- Chapter 656, Section 656.404, Site Plan Requirements;
- Chapter 655 Concurrency Management System; and
- Chapter 654 Code of Subdivision Regulations.

Applicable LDRs for Clay County Include:

- Ordinance 93-16, Zoning;
- Ordinance 85-68, Subdivision Regulations;
- Ordinance 93-16 and 85-68, Site Plan Requirements; and

- Ordinance 92-19, Concurrency Management.

In the local development review process, principal reviewers and approval entities may include the Planning and Development Department, Public Works Department, the Planning Commission, and the City and/or County Commission, depending on the specific components of an application for development at the former Cecil Field property.

6 Unavoidable Adverse Environmental Effects and Considerations that Offset Adverse Effects

Unavoidable adverse impacts associated with implementation of the Preferred Reuse Plan include effects associated with site clearance, construction, and infrastructure installation/ improvement. Early stages of redevelopment activity would involve demolition activity. Buildings with little or no evaluated potential for reuse, old steam lines, machinery, utilities, and other unnecessary structures would be demolished. Adverse environmental effects that would occur during demolition activities include periodic high noise levels, fugitive dust emissions, increased vehicle traffic, and a temporarily increased demand for solid waste disposal capacity. These effects, however, would be short term and would be contained in areas where specific redevelopment activities are proposed.

As new construction projects are undertaken on the property, temporary adverse environmental effects that may be expected include increased construction vehicle traffic, fugitive dust emissions, and increased noise levels. Considerations that offset these effects are their temporary duration and localized nature, and that individual developers would be required to undertake standard construction mitigation measures through the local permitting process, such as soil erosion control measures and fugitive dust controls.

Redevelopment activities are expected to be phased in over a 12-year period. As a result, demand for water supply, steam supply, and potable water supply are expected to decrease substantially in the early stages of redevelopment. Peak demand under the full redevelopment scenario is still expected to be less than under pre-closure conditions.

Other minor adverse impacts that cannot be avoided during implementation of the Preferred Reuse Plan include changes in vehicular traffic compared to pre-closure levels (see Section 4.8), air emissions from mobile sources (see Section 4.5), and loss of vegetation and soil disturbance at the site of new construction (see Sections 4.2 and 4.3).

Considerations that offset these impacts are the projected beneficial economic impacts targeted at mitigating the effects of closure of NAS Cecil Field. Redevelopment of the station provides a greater potential for job creation and retention by taking full advantage of the existing infrastructure present at NAS Cecil Field. Further, the ultimate receiving entity will mitigate impacts through the preparation of various plans to guide site-specific improvements and resource management at the station property, including a forestry management plan, master street plan, potable water supply system plan, sanitary sewer system plan, and master drainage plan.

7 Relationship Between Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the environment under the proposed action include temporary impacts to the physical environment during site preparation and demolition/construction and short-term socioeconomic impacts, including maintenance/construction costs, expenditure of public funds for site improvements, and lost productivity and wages. The proposed redevelopment of NAS Cecil Field would enhance the site's long-term productivity by developing productive long-term uses; increasing the efficiency and effectiveness of the use of the property; providing land for needed industrial/economic development; improving aesthetic resources; and increasing economic activity, revenue generation, and employment in the surrounding Duval County/Clay County area.

Prior to redevelopment of the station property, existing buildings with no reuse potential would need to be demolished, existing infrastructure would need to be modified or removed, environmental restoration would be required, and vegetation would be removed to clear areas for redevelopment. Some wildlife would be displaced, and soils would be exposed to possible wind or storm water erosion until the area is covered or replanted. Other wildlife would be permanently displaced as a result of alteration of habitats. Short-term environmental impacts would result from vehicle noise and emissions during the construction period, but these impacts would be mitigated to the extent possible. Appropriate soil erosion and sediment control plans and storm water management plans would be prepared by redevelopers for applicable construction sites according to City of Jacksonville Comprehensive Plan requirements.

Long-term productivity of much of the forested areas on the station will be maintained and potentially enhanced by continued forestry management and clearing activities. These activities will retain the productivity of forestry resources and maintain the diversity of habitat types and overall biological productivity.

8 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resources will be committed by the Navy, the ultimate receiving entity and other entities to redevelop NAS Cecil Field. Resources committed would include building materials and supplies, C&D labor, planning/engineering cost, approximately 17,202 acres of federally owned land, and natural resources such as water, air, and electricity or gas for power.

The expenditure of public funds for site preparation and redevelopment activities is not entirely irretrievable in that the investment will improve the desirability of the lands, increase the likelihood of redevelopment, and create the economic benefits that are a primary goal of the Preferred Reuse Plan. As such, these public expenditures will be partially retrieved by implementation of Preferred Reuse Plan as proposed.

Investments made by the Navy to remediate site contamination and relocate existing personnel and support equipment (i.e., aircraft, etc.) would also be an irretrievable commitment of funds. However, commitment of these funds would have a positive effect on future DoD budgets and expenditures.

9 Energy Requirements and Conservation Potential

The proposed action would result in a short-term decrease in energy demand by the facilities on the property. The demand for energy would increase following complete implementation of the Preferred Reuse Plan but it is not expected to match pre-closure levels. The demolition of nonreusable buildings and upgrade of older buildings scheduled for reuse would result in much greater energy efficiency across the property.

Also, the demolition of older structures to allow for the construction of more-energy-efficient facilities, would improve cooling and heating efficiencies to reduce the overall demand for electrical power on the station property. New facilities to be constructed would be designed with energy-efficient heating and cooling systems.

Although aircraft operations at the station will be continued pursuant to the Preferred Reuse Plan, the level of operations will be significantly reduced from pre-closure conditions (see Section 4.8.1). This will result in a net reduction in the overall use of aviation fuel in the Jacksonville area.

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future investigations of the property. These constraints would be identified and imposed by the Army at the time of deed transfer. Currently, the facility is in compliance with all applicable federal environmental statutes and executive orders.

Implementation of the unencumbered alternative would have similar environmental effects as the encumbered disposal alternative. However, unencumbered disposal would require the Army to remediate for all site contamination, including the buried, non-friable asbestos-containing water distribution and sewage lines. These lines are not a hazard to human health or the environment, unless disturbed.

Implementation of the no-action alternative would perpetuate maintenance costs incurred by the Army. Additionally, no remedial actions would be taken for known contaminants on the site.

The EA results in a Finding of No Significant Impact (FNSI), therefore an Environmental Impact Statement (EIS) is not required for encumbered disposal of Nike KC-30.

DATES: Coments must be received on or before February 24, 1995.

ADDRESSEE: Persons wishing to comment may obtain a copy of the EA or inquire regarding the FNSI by writing to Mr. Alan Gehrt, Environmental Resources Branch, Planning Division, U.S. Army Corps of Engineers, Kansas City, 601 East 12th Street, Kansas City, Missouri 64106-2896.

FOR FURTHER INFORMATION: Questions regarding this FNSI may be directed to the U.S. Army Corps of Engineers, ATTN: Mr. Alan Gehrt, at (816) 426-3358.

Dated: January 19, 1995.

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[FR Doc. 95-1869 Filed 1-24-95; 8:45 am]

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Department of the Navy

Notice of Intent To Prepare an Environmental Impact Statement for Disposal and Reuse of Naval Air Station Cecil Field, Florida

Pursuant to the National Environmental Policy Act as implemented by the Council on Environmental Quality Regulations (40 CFR parts 1500-1508), the Department of the Navy announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the potential environmental effects of disposal and reuse of Naval Air Station (NAS) Cecil Field, located in Duval and Clay Counties near Jacksonville, Florida.

In accordance with the Defense Base Closure and Realignment Act (DBCRA) (PL 101-510), as implemented by the 1993 Base Realignment And Closure process, the Navy has been directed to close and dispose of NAS Cecil Field and its associated Outlying Landing Field (OLF) at Whitehouse.

The proposed action to be evaluated in the EIS involves the disposal of land, buildings, and infrastructure at NAS Cecil Field, including OLF Whitehouse which is located approximately seven miles to the north. The Navy intends to analyze the environmental effects of disposal of NAS Cecil Field based upon reasonable reuse scenarios for the property. The community established a local redevelopment authority, identified as the Cecil Field Development Commission (CFDC), that is charged with planning appropriate new uses for the properties. The EIS will evaluate these alternative reuse scenarios, including the "no action" alternative (retention of the property in caretaker status). However, because of the process mandated by DBCRA, selection of the "no action" alternative would be considered impracticable for the Navy to implement.

The EIS will evaluate the impacts of disposal and reuse of NAS Cecil Field properties on the natural environment, including but not limited to, plant and wildlife habitats, water resources such as streams and wetlands, and air quality. It will also evaluate effects on the socioeconomic environment, including potential impacts to the regional economy, the local tax base, and land uses. In addition, as required by Section 106 of the National Historic Preservation Act, the Navy will be preparing a cultural resources survey to determine if any sensitive archaeological resources or historic buildings or structures will be affected by the proposed reuse.

The Navy is initiating a scoping process for the purpose of determining the scope of issues to be addressed and for identifying significant issues related to proposed reuse. The Navy will hold a public scoping meeting on February 9, 1995, beginning at 7:00 p.m. in the Main Drill Hall at the Post of Snyder, Florida Army National Guard Center, 9900 Normandy Boulevard, Jacksonville, Florida. The location of this meeting will also be advertised in local and regional newspapers.

A brief presentation will precede a request for public comment and will include a presentation on proposed uses that have been identified for the properties. Navy representatives will be available at this meeting to receive comments regarding issues of concern to the public. It is important that federal, state, and local agencies and interested individuals take this opportunity to identify environmental concerns that should be addressed during the preparation of the EIS. Further, because it is anticipated that the CFDC reuse-plan will not be completed until July, 1995, the scoping process offers an opportunity to incorporate public environmental concerns into the CFDC planning process.

Agencies and the public are also invited and encouraged to provide written comment in addition to, or in lieu of, oral comments at the scoping meeting. To be most helpful, scoping comments should clearly describe the specific issues or topics the commenter believes the EIS should address. In the interest of available time, each speaker will be asked to limit oral comments to five minutes. Written statements and/or questions regarding the scoping process should be mailed no later than March 11, 1995, to: Commanding Officer, Southern Division, Naval Facilities Engineering Command, P.O. Box 190010, North Charleston, SC 29419-9010, (Attn: Mr. Robert Teague, Code 203RT) telephone (803) 743-0785.

Dated: January 20, 1995.

L. R. McNees,

LCDR, JAGC, USN, Federal Register Liaison Officer.

[FR Doc. 95-1889 Filed 1-24-95; 8:45 am]

BILLING CODE 3810-FF-P

Government-owned Inventions; Availability for Licensing

AGENCY: Department of the Navy, DOD.

ACTION: Notice of availability of inventions for licensing.

SUMMARY: The inventions listed below are assigned to the United States Government as represented by the Secretary of the Navy and are made available for licensing by the Department of the Navy.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $3.00 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Virginia 22161 for $6.95 each ($10.95 outside North American Continent). Requests for copies of patent applications must include the patent application serial number. Claims are

In 1933, police radio changed crime forever

Bill Foley

Success must be reported in the endeavor to find a local angle to the O.J. Simpson story.

The Nicole Simpson 911 calls replayed on national television last week recalled that we are at the 62nd anniversary of the police radio in Jacksonville.

A little past the anniversary, but close enough.

Without police radios, of course, we would not have a 911 system.

And, of course, without radio, we would not have the miracle of television and would not be able to watch O.J. Simpson 24 hours a day.

Quite likely, however, we still would have crime.

Somehow crime survived the technological miracle of the police radio, which was introduced on the mean streets of Jacksonville in January 1933.

It was a technological breakthrough that would change crime forever.

Not end it, but change it.

The debut of police radio station WPFG came as crime, and public reaction to crime, swept the land. Jacksonville was no exception.

The nexus of Prohibition and the Great Depression had spawned the Fool's Gold Era of American Lawlessness. Fear, revulsion and a twisted glamour swirled into a tarnished caldron of public opinion.

Whatever evil lurked in the hearts of men those early years of the New Deal, technology exacerbated it. Radio and movies gave it dimension. The automobile gave it mobility. Freewheeling banditti of the hinterland begged the credibility of "Crime does not pay."

Crime was celebrated in the press and the pulps. Kidnappings, jewel thefts, bank robberies and a potpourri of bizarre misdoing commanded the headlines of the nation and captured its imagination.

John Dillinger terrorized the Midwest. Desperado Wilbur Underhill, the "Tri-State Terror," terrorized the Southwest. A monotonous litany of miscreants of the month terrorized hither and yon. Often the citizenry terrorized right back.

Jacksonville businessman Morri lice Radio WPFG would be Jacksonville's second radio station and its longest enduring.

Ironically, one of the first days WPFG was on the air, the city-owned WJAX itself brought down a desperado — perhaps the first nailed through the local ether.

Bandits tied up Doc Rawls at his Panama drug store the afternoon of that January Tuesday and held a gun on soda jerk Marvin Odom while they looted the cash register and fled in a speeding car.

J.G. Rawls was not a man to trifle with. He was a former county commissioner and well connected. Rawls and a friend jumped in a car and roared after the bandits. WJAX broadcast news of the robbery and the wild chase Georgia-ward.

Waycross Assistant Police Chief F.L. Martin picked up the WJAX flash and ran the bad guys into a telephone pole as soon as they roared into Waycross. The men were arrested. The loot was recovered. Radio had won a crime-fighting feather.

Veteran police communications officers R.C. Campbell and W.A. Mayhew were placed in charge of taking calls for the new radio system. Microphones were placed in the captain's office and detective headquarters at 711 Liberty St.

The system was installed by George P. Allen, chief of the police and fire signal bureau, and Jack Hawkins of WJAX in a money-saving move.

"By having the work done without the use of federal engineers, the city is saving about $1,500 in installation costs," the Jacksonville Journal reported.

At the end of the first year, about 20,000 calls had gone out over the system, covering offenses from vagrancy to homicide. Almost half of the calls came between 4 and 11 p.m.

Total cost of the system over the year, installation and operation, had been about $10,000. The Florida Times-Union said this had been recovered through the amount of stolen property reclaimed alone.

But the major impact had been on the morale of the department, the newspaper said. The radio had ensured the prompt dispatch of assistance to crime scenes, thereby discouraging crime on the one hand and increasing the chances of arrest on the other.

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A-5

B Listings of Wildlife and Plants at NAS Cecil Field

Table B-1

COMMON AND SCIENTIFIC NAMES OF AMPHIBIANS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Southern Cricket Frog	*Acris gryllus gryllus*
Flatwoods Salamander	*Ambystoma cingulatum*
Marbled Salamander	*Ambystoma opacum*
Mole Salamander	*Ambystoma talpoideum*
Tiger Salamander	*Ambystoma tigrinum*
Two-toed Amphiuma	*Amphiuma means*
Oak Toad	*Bufo quercicus*
Southern Toad	*Bufo terrestris*
Southern Dusky Salamander	*Desmognathus auriculatus*
Greenhouse Frog	*Eleutherodactylus planirostris*
Two-lined Salamander	*Eurycea bislineata*
Dwarf Salamander	*Eurycea quadridigitata*
Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*
Green Treefrog	*Hyla cinerea*
Southern Spring Peeper	*Hyla crucifer bartramiana*
Pine Woods Treefrog	*Hyla femoralis*
Barking Treefrog	*Hyla gratiosa*
Squirrel Treefrog	*Hyla squirella*
Gray Treefrog	*Hyla versicolor*
Little Grass Frog	*Limnaoedus ocularis*
Striped Newt	*Notophthalmus perstriatus*
Central Newt	*Notophthalmus viridescens louisianensis*
Peninsular Newt	*Notophthalmus viridescens piaropicola*
Slimy Salamander	*Plethodon glutinosus*
Southern Chorus Frog	*Pseudacris nigrita*
Ornate Chorus Frog	*Pseudacris ornata*
Dwarf Siren	*Pseudobranchus striatus*
Rusty Salamander	*Pseudotriton montanus floridanus*
Florida Gopher Frog	*Rana areolata aesopus*

Table B-1

COMMON AND SCIENTIFIC NAMES OF AMPHIBIANS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
River Frog	*Rana heckscheri*
Southern Leopard Frog	*Rana sphenocephala*
Eastern Spadefoot Toad	*Scaphiopus holbrooki holbrooki*
Eastern Lesser Siren	*Siren intermedia intermedia*

Table B-2

COMMON AND SCIENTIFIC NAMES OF BIRDS THAT BREED OR MAY BREED AT NAS CECIL FIELD

Common Name	Scientific Name
Cooper's Hawk	*Accipiter cooperii*
Red-winged Blackbird	*Agelaius phoeniceus*
Bachman's Sparrow	*Aimophila aestivalis*
Wood Duck	*Aix sponsa*
Anhinga	*Anhinga anhinga*
Scub Jay	*Aphelocoma coerulescens*
Limpkin	*Aramus guarauna*
Ruby-throated Hummingbird	*Archilochus colubris*
Great Blue Heron	*Ardea herodias*
American Bittern	*Botaurus lentiginosus*
Great Horned Owl	*Bubo virginianus*
Cattle Egret	*Bubulcus ibis*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo lineatus*
Broad-winged Hawk	*Buteo platypterus platypterus*
Green-backed Heron	*Butorides virescens virescens*
Muscovy Duck	*Cairina moschata*
Chuck-will's Widow	*Caprimulgus carolinensis*
Northern Cardinal	*Cardinalis cardinalis*
Boat-tailed Grackle	*Cassidix major*
Turkey Vulture	*Cathartes aura*
Red-bellied Woodpecker	*Centurus carolinus*
Chimney Swift	*Chaetura pelagica*
Killdeer	*Charadrius vociferus*
Common Nighthawk	*Chordeiles minor*
Yellow-billed Cuckoo	*Coccyzus americana*
Common Flicker	*Colaptes auratus*
Rock Dove	*Columba livia*
Northern Bobwhite	*Colinus virginianus*

Table B-2

COMMON AND SCIENTIFIC NAMES OF BIRDS THAT BREED OR MAY BREED AT NAS CECIL FIELD

Common Name	Scientific Name
Eastern Wood Pewee	*Contopus virens*
Black Vulture	*Coragyps atratus*
Common Crow	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Blue Jay	*Cyanocitta cristata*
Downy Woodpecker	*Dendrocopus pubescens*
Hairy Woodpecker	*Dendrocopus villosus*
Yellow-throated Warbler	*Dendroica dominica*
Prairie Warbler	*Dendroica discolor*
Pine Warbler	*Dendroica pinus*
Pileated Woodpecker	*Dryocopus pileatus*
Great Egret	*Egretta alba*
Little Blue Heron	*Egretta caerulea*
Tricolored Heron	*Egretta tricolor*
American Swallow-tailed Kite	*Elanoides forticatus*
Acadian Flycatcher	*Empidonax virescens*
Southeastern American Kestrel	*Falco sparverius paulus*
American Coot	*Fulica americana*
Common Moorhen	*Gallinula chloropus*
Common Yellowthroat	*Geothlypis trichas*
White Ibis	*Guara albus*
Blue Grosbeak	*Guiraca caerulea caerulea*
Bald Eagle	*Haliaeetus leucocephalus*
Wood Thrush	*Hylocichla mustelina*
Yellow-breasted Chat	*Icteria virens*
Orchard Oriole	*Icterus spurius*
Mississippi Kite	*Ictinia mississippiensis*
Least Bittern	*Ixobrychus exilis*
Loggerhead Shrike	*Lanius ludorvicianus*

Table B-2

COMMON AND SCIENTIFIC NAMES OF BIRDS THAT BREED OR MAY BREED AT NAS CECIL FIELD

Common Name	Scientific Name
Swainson's Warbler	*Limnothlypis swainsonii*
Belted Kingfisher	*Megaceryle alcyon*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Wild Turkey	*Meleagris gallopavo*
Northern Mockingbird	*Mimus polyglottos*
Brown-headed Cowbird	*Molothrus ater*
Great-crested Flycatcher	*Myiarchus crinitus*
Black-crowned Night Heron	*Nycticorax nycticorax*
Yellow-crowned Night Heron	*Nycticorax violacea*
Eastern Screech Owl	*Otus asio asio*
Osprey	*Pandion haliaetus*
Tufted Titmouse	*Parus bicolor*
Carolina Chickadee	*Parus carolinensis*
House Sparrow	*Passer domesticus*
Indigo Bunting	*Passerina cyanea*
American Woodcock	*Philohela minor*
Red-cockaded Woodpecker	*Picoides borealis*
Rufus-sided Towhee	*Pipilo erythrophthalmus*
Summer Tanager	*Piranga rubra*
Pied-billed Grebe	*Podilymbus podiceps*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Purple Gallinule	*Porphyrula martinica*
Purple Martin	*Progne subis*
Prothonotary Warbler	*Protonotaria citrea*
Common Grackle	*Quiscalus quiscula*
King Rail	*Rallus elegans*
Virginia Rail	*Rallus limicola*
Eastern Bluebird	*Sialia sialis*
Brown-headed Nuthatch	*Sitta pusilla*

Table B-2

COMMON AND SCIENTIFIC NAMES OF BIRDS THAT BREED OR MAY BREED AT NAS CECIL FIELD

Common Name	Scientific Name
Field Sparrow	*Spizella pusilla*
Rough-winged Swallow	*Stelgidopteryx ruficollis*
Barred Owl	*Strix varia georgica*
Eastern Meadowlark	*Sturnella magna*
Euopean Starling	*Sturnus vulgaris*
Carolina Wren	*Thryothorus ludovicianus*
Brown Thrasher	*Toxostoma rufum*
Eastern Kingbird	*Tyrannus tyrannus*
Common Barn Owl	*Tyto alba*
Bachman's Warbler	*Vermivora bachmanii*
Yellow-throated Vireo	*Vireo flavifrons*
White-eyed Vireo	*Vireo griseus*
Red-eyed Vireo	*Vireo olivaceus*
Hooded Warbler	*Wilsonia citrina*
Mourning Dove	*Zenaida macroura*

Table B-3

COMMON AND SCIENTIFIC NAMES OF FISH COLLECTED AT NAS CECIL FIELD BY THE U.S. FISH AND WILDLIFE SERVICE IN 1986

Common Name	Scientific Name
American Eel	*Anguilla rostrata*
Lake Chubsucker	*Erimyzon sucetta*
Redfin Pickerel	*Esox americanus*
Longnose Killifish	*Fundulus similis*
Mosquitofish	*Gambusia affinis*
Brown Bullhead	*Ictalurus nebolosus*
Channel Catfish	*Ictalurus punctatus*
Brook Silverside	*Labidesthes sicculus*
Florida Gar	*Lepisosteus platyrhincus*
Warmouth	*Lepomis gulosus*
Bluegill	*Lepomis macrochirus*
Dollar Sunfish	*Lepomis marginatus*
Redear Sunfish	*Lepomis microlophus*
Largemouth Bass	*Micropterus salmoides*
Golden Shiner	*Notemigonus crysoleucas*

Table B-4

COMMON AND SCIENTIFIC NAMES OF MAMMALS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Southern Short-tailed Shrew	*Blarina carolinensis*
Eastern Coyote	*Canis latrans*
Beaver	*Castor canadensis*
Least Shrew	*Cryptotis parva*
Nine-banded Armadillo	*Dasypus novemcinctus*
Opossum	*Didelphis marsupialis*
Big Brown Bat	*Eptesicus fuscus*
Southeastern Pocket Gopher	*Geomys pinetis*
Southern Flying Squirrel	*Glaucomys volans*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Northern Yellow Bat	*Lasiurus intermedius*
Seminole Bat	*Lasiurus seminolus*
River Otter	*Lutra canadensis*
Bobcat	*Lynx rufus*
Striped Skunk	*Mephitis mephitis*
House Mouse	*Mus musculus*
Long-tailed Weasel	*Mustela frenata*
North American Mink	*Mustela vison*
Southeastern Myotis	*Myotis austroriparius*
Florida Water Rat	*Neofiber alleni*
Eastern Wood Rat	*Neotoma floridana*
Evening Bat	*Nycticeius humeralis*
White-tailed Deer	*Odocoileus virginianus*
Marsh Rice Rat	*Oryzomys palustris*
Florida Mouse	*Peromyscus floridanus*
Cotton Mouse	*Peromyscus gossypinus*
Golden Mouse	*Peromyscus nuttalli*
Old Field Mouse	*Peromyscus polionotus*

Table B-4

COMMON AND SCIENTIFIC NAMES OF MAMMALS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Eastern Pipistrel	*Pipistrellus subflavus*
Pine Vole	*Pitymys pinetorum*
Rafinesquii's Big-eared Bat	*Plecotus rafinesquii*
Racoon	*Procyon lotor*
Norway Rat	*Rattus norregicus*
Black Rat	*Rattus rattus*
Eastern Harvest Mouse	*Reithrodontomys humulis*
Eastern Mole	*Scalopus aquaticus*
Gray Squirrel	*Sciurus carolinensis*
Southeastern Fox Squirrel	*Sciurus niger*
Hispid Cotton Rat	*Sigmodon hispidus*
Southeastern Shrew	*Sorex longirostris*
Spotted Skunk	*Spilogale putorius*
Wild Hog	*Sus scofa*
Eastern Cottontail	*Sylvilagus floridanus*
Marsh Rabbit	*Sylvilagus palustris*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Gray Fox	*Urocyon cinereoargenteus*
Florida Black Bear	*Ursus americanus floridanus*
Red Fox	*Vulpes fulva*

Table B-5

COMMON AND SCIENTIFIC NAMES OF REPTILES THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Cottonmouth	*Agkistrodon piscivorus*
American Alligator	*Alligator mississippiensis*
Green Anole	*Anolis carolinensis*
Worm Snake	*Carphophis amoenus*
Florida Scarlet Snake	*Cemophora coccinea coccinea*
Florida Snapping Turtle	*Chelydra serpentina osceola*
Florida Cooter	*Chrysemys floridana floridana*
Peninsular Cooter	*Chrysemys floridana peninsularis*
Florida Red-bellied Turtle	*Chrysemys nelsoni*
Spotted Turtle	*Clemmys guttata*
Six-lined Racerunner	*Cnemidophorus sexlineatus*
Southern Black Racer	*Coluber constrictor priapus*
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*
Florida Chicken Turtle	*Deirochelys reticularia chrysea*
Southern Ringneck Snake	*Diadophis punctatus punctatus*
Eastern Indigo Snake	*Drymarchon corais couperi*
Yellow Rat Snake	*Elaphe obsoleta quadrivittata*
Peninsular Mole Skink	*Eumeces egregius onocrepis*
Northern Mole Skink	*Eumeces egregius similus*
Southeastern Five-lined Skink	*Eumeces inexpectatus*
Broadhead Skink	*Eumeces laticeps*
Eastern Mud Snake	*Farancia abacura*
Rainbow Snake	*Farancia erytrogramma*
Gopher Tortoise	*Gopherus polyphemus*
Mediterranean Gecko	*Hemidactylus turcicus*
Eastern Hognose Snake	*Heterodon platyrhinos*
Southern Hognose Snake	*Heterodon simus*
Striped Mud Turtle	*Kinosternon bauri*
Florida Mud Turtle	*Kinosternon subrubrum steindachneri*

Table B-5

COMMON AND SCIENTIFIC NAMES OF REPTILES THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Florida Kingsnake	*Lampropeltis getulus floridana*
Scarlet Kingsnake	*Lampropeltis triangulum*
Eastern Coachwhip	*Masticophis flagellum*
Eastern Coral Snake	*Micrurus fulvius fulvius*
Sand Skink	*Neoseps reynoldsi*
Florida Green Water Snake	*Nerodia cyclopion floridana*
Red-bellied Water Snake	*Nerodia erythrogaster*
Florida Water Snake	*Nerodia fasciata pictiventris*
Brown Water Snake	*Nerodia taxispilota*
Rough Green Snake	*Opheodrys aestivus*
Eastern Slender Glass Lizard	*Ophisaurus attenuatus longicaudus*
Island Glass Lizard	*Ophisaurus compressus*
Eastern Glass Lizard	*Ophisaurus ventralis*
Florida Pine Gopher Snake	*Pituophis melanoleucus*
Striped Crayfish Snake	*Regina alleni*
Glossy Crayfish Water Snake	*Regina rigida*
Pine Woods Snake	*Rhadinaea flavilata*
Worm Lizard	*Rhineura floridana*
Southern Fence Lizard	*Sceloporus undulatus*
Florida Scrub Lizard	*Sceloporus woodi*
Ground Skink	*Scinella lateralis*
Swamp Snake	*Seminatrix pygaea*
Loggerhead Musk Turtle	*Sternotherus minor minor*
Stinkpot	*Sternotherus odoratus*
Short-tailed Snake	*Stilosoma extenuatum*
Florida Red-bellied Snake	*Storeria occipitomaculata*
Central Florida Crown Snake	*Tantilla relicta neilli*
Florida Box Turtle	*Terrapene carolina bauri*
Peninsular Ribbon Snake	*Thamnophis sauritus sackeni*

Table B-5

COMMON AND SCIENTIFIC NAMES OF REPTILES THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Eastern Garter Snake	*Thamnophis sirtalis*
Florida Softshell	*Trionyx ferox*
Eastern Smooth Earth Snake	*Virginia valeriae*

Table B-6

COMMON AND SCIENTIFIC NAMES OF PLANTS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Trees	
Florida Maple	*Acer barbatum*
Red Maple	*Acer rubrum*
Silver Maple	*Acer saccharinum*
American Hornbeam	*Carpinus caroliniana*
Pignut Hickory	*Carya glabra*
Mockernut Hickory	*Carya tomentosa*
Hackberry	*Celtis spp.*
Redbud	*Cercis canadensis*
Flowering Dogwood	*Coernus florida*
Persimmon	*Diospyros virginiana*
Loblolly Bay	*Gorddonia lasianthus*
Red Cedar	*Juniperus virginiana*
Sweetgum	*Liquidambar styraciflua*
Southern Magnolia	*Magnolia gradiflora*
Sweetbay	*Magnolia virginiana*
Red Mulberry	*Morus rubra*
Blackgum	*Nyssa biflora*
Black Gum	*Nyssa sylvatica*
Eastern Hophornbeam	*Ostrya virginiana*
Redbay	*Persea borbonia*
Sand Pine	*Pinus clausa*
Shortleaf Pine	*Pinus echinata*
Slash Pine	*Pinus elliotii*
Spruce Pine	*Pinus glabra*
Longleaf Pine	*Pinus palustris*
Loblolly Pine	*Pinus taeda*
Laurel Cherry	*Prunus caroliniana*
Black Cherry	*Prunus serotina*

Table B-6

COMMON AND SCIENTIFIC NAMES OF PLANTS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
White Oak	*Quercus alba*
Bluejack Oak	*Quercus incana*
Laurel Oak	*Quercus laurifolia*
Turkey Oak	*Quercus laevis*
Sand Post Oak	*Quercus margaretta*
Blackjack Oak	*Quercus marlandica*
Swamp Chestnut Oak	*Quercus michauxii*
Chinkapin Oak	*Quercus muehlenbergii*
Water Oak	*Quercus nigra*
Runner Oak	*Quercus pumila*
Post Oak	*Quercus stellata*
Live Oak	*Quercus virginiana*
Cabbage Palm	*Sabal palmetto*
Willow	*Salix caroliniana*
Bold Cypress	*Taxodium distichum*
Pond Cypress	*Taxodium distichum var. nutans*
Basswood	*Tilia spp.*
Winged Elm	*Ulmus alata*
Florida Elm	*Ulmus americana v. floridana*
Slippery Elm	*Ulmus rubra*
Shrubs	
Devil's Walking Stick	*Aralia spinosa*
Tar Flower	*Befaria racemosa*
Gum Bumelia	*Bumelia lanuginosa*
Beautyberry	*Callicarpa americana*
Sedges	*Carex spp.*
Buttonbush	*Cephalanthus occidentalis*
Fringe-tree	*Chionanthus virginica*
Buckwheat	*Cliftonia monophylla*

Table B-6

COMMON AND SCIENTIFIC NAMES OF PLANTS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Titi	*Cyrilla racemiflora*
Strawberry Bush	*Euonymus americanus*
Huckleberry	*Gaylussacia spp.*
Silverbells	*Halesia spp.*
St. Johns Wort	*Hypericum spp.*
Carolina Holly	*Ilex ambigua*
Dahoon	*Ilex cassine*
Gallberry	*ilex glabra*
Myrtle Dahoon	*Ilex myrtifolia*
American Holly	*Ilex opaca*
Yaupon	*Ilex vomitoria*
Wild Indigo	*Indigofera spp.*
Gopher Apple	*Licania michauxii*
Stagger Bush	*Lyonia spp.*
Fetterbush	*Lyonia lucida*
Wax Myrtle	*Myrica cerifera*
Wild Olive	*Osmanthus americana*
Winged Sumac	*Rhus copallina*
Blue Stem Palmetto	*Sabal minor*
Sassafras	*Sassafras albidum*
Saw Palmetto	*Serenoa repens*
Horse Sugar	*Symplocos tinctoria*
Sparkleberry	*Vaccinium arboreum*
Blueberry	*Vaccinium spp.*
Herbaceous	
False Foxglove	*Agalinis spp.*
Alligator Weed	*Alternanthera philoxeroides*
Broomsedge	*Andropogon virginicus*
Wiregrass	*Aristida spp.*

Table B-6

COMMON AND SCIENTIFIC NAMES OF PLANTS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Cane	*Arundinaria gigantea*
Asters	*Aster spp.*
Yellow Foxglove	*Aureolaria flava*
Water Hyssop	*Bacopa caroliniana*
Deer Tongue	*Carphephorus paniculatus*
Partridge Pea	*Cassias fasciculata*
Golden Aster	*Chrysopsis spp.*
Swamp Lilies	*Crinum americanum*
Sundew	*Drosera capillaris*
Spikerush	*Eleocharis spp.*
Beech Drops	*Epifagus virginiana*
Pinhead	*Eriocaulon spp.*
Wild Buckwheet	*Eriogonum tomentosum*
Dogfennel	*Eupatorium capillifolium*
Milk Peas	*Galactia spp.*
Bedstraw	*Galium spp.*
Yellow Jessamine	*Gelsemium spp.*
Dollarweeds	*Hydrocotyle spp.*
Bog Buttons	*Lachnocaulon spp.*
Pine Lily	*Lilium catesbaei*
Frog Bit	*Limnobium spongia*
Partridgeberry	*Mitchella repens*
Cinnamon Fern	*Osmunda cinnamonea*
Royal Fern	*Osmunda regalis*
Cutthroat Grass	*Panicum abscissum*
Smart Weed	*Polygonum hydropiperiodes*
Pickerel Weed	*Pontederia lanceolata*
Bracken Fern	*Pteridium aquilinum*
Pitcher Plants	*Sarracenia spp.*

Table B-6

COMMON AND SCIENTIFIC NAMES OF PLANTS THAT OCCUR OR MAY OCCUR AT NAS CECIL FIELD

Common Name	Scientific Name
Lizards Tail	*Saururus cernuus*
Bullrush	*Scirpus spp.*
Greenbriar	*Smilax spp.*
Sarsaparilla vine	*Smilax pumila*
Goldenrod	*Solidago spp.*
Indian Grass	*Sorghastrum spp.*
Spagnum Moss	*Sphagnum spp.*
Pinewoods Dropseed	*Sporobolus junceus*
Queen's Delight	*Stillingia sylvatica*
Trilliums	*Trillium spp.*
Goat's Rue	*Tephrosia virginiana*
Cattail	*Typha spp.*
Yellow-eyed Grass	*Xyris spp.*

C Agency Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
6620 Southpoint Drive, South
Suite 310
Jacksonville, Florida 32216-0912

NOV 16 1994

Mr. Michael P. Losito, Ph.D.
Ecology and Environment, Inc.
Buffalo Corporate Center
368 Pleasantview Drive
Lancaster, NY 14086

RE: Information on Listed Species, Cecil Field NAS

FWS Log No: 1-4-95-067F
Request Date: November 4, 1994
Applicant: Ecology and Environment, Inc.
Counties: Clay and Duval

Dear Dr. Losito:

This responds to your above referenced letter requesting a list of federally threatened and endangered species that may be present within the areas specified. Data on site-specific occurrence of listed species is limited, therefore, your office may have to make a determination of occurrence. I have enclosed a list of designated species for the counties specified. The enclosed list does not include state listed species. The Florida Game and Fresh Water Fish Commission should be contacted to identify state listed species that may be present at this location. Additionally, you may wish to contact Mr. Hank Cockran, Environmental Department, Cecil Field NAS.

If you have further questions, please contact Mr. Marc Epstein at 904-232-2580.

Sincerely yours,
Michael M. Bentzien
Acting Field Supervisor

Enclosures

FLORIDA

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES, AND CANDIDATE SPECIES

January 1994

COUNTY: DUVAL

Bat, Rafinesque's Big-eared = Southeastern	*Plecotus rafinesquii*	C2
Bear, Florida Black	*Ursus americanus floridanus*	C2
Butterfly, Sweadner's Olive Hairstreak	*Mitoura gryneus sweadneri*	C2
Crayfish, Black Creek	*Procambarus pictus*	C2
Crownbeard, Variable-leaf	*Verbesina heterophylla*	C2
Eagle, Bald	*Haliaeetus leucocephalus*	E
Frog, Florida Crawfish = Gopher	*Rana areolata aesopus*	C2
Groove-bur, Incised	*Agrimonia incisa*	C2
Kestrel, Southeastern	*Falco sparverius paulus*	C2
Ladies-tresses, Green	*Spiranthes polyantha*	C2
Manatee, West Indian	*Trichechus manatus latirostris*	E/CH
Milkweed, Florida	*Matelea floridana*	C2
Milkweed, Southern	*Asclepias viridula*	C2
Plover, Piping	*Charadrius melodus*	T
Rail, Black	*Laterallus jamaicensis*	C2
Salamander, Flatwoods	*Ambystoma cingulatum*	C2
Sandgrass, Curtiss'	*Calamovilfa curtisii*	C2
Skipper, Eastern Beard Grass	*Atrytone arogos arogos*	C2

FLORIDA

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES, AND CANDIDATE SPECIES

January 1994

Snake, Eastern Indigo	*Drymarchon corais couperi*	T
Snake, Florida Pine	*Pituophis melanoleucus mugitus*	C2
Sparrow, Bachman's	*Aimophila aestivalis*	C2
Squirrel, Sherman's Fox	*Sciurus niger shermani*	C2
Stork, Wood	*Mycteria americana*	E
Sturgeon, Shortnose	*Acipenser brevirostrum*	E
Sunflower, Lake-side	*Helianthus carnosus*	C2
Tortoise, Gopher	*Gopherus polyphemus*	C2
Turtle, Green Sea	*Chelonia mydas*	T
Turtle, Hawksbill Sea	*Eretmochelys imbricata*	E
Turtle, Kemp's Ridley Sea	*Lepidochelys kempii*	E
Turtle, Leatherback Sea	*Dermochrlys coriacea*	E
Turtle, Loggerhead Sea	*Caretta caretta*	T
Woodpecker, Red-cockaded	*Picoides borealis*	E

FLORIDA

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES, AND CANDIDATE SPECIES

January 1994

COUNTY: CLAY

Bat, Rafinesque's Big-eared = Southeastern	*Plecotus rafinesquii*	C2
Bear, Florida Black	*Ursus americanus floridanus*	C2
Coneflower, Yellow (St. Johns Susan)	*Rudbeckia nitida*	C2
Crayfish, Black Creek	*Procambarus pictus*	C2
Crownbeard, Variable-leaf	*Verbesina heterophylla*	C2
Eagle, Bald	*Haliaeetus leucocephalus*	E
Frog, Florida Crawfish = Gopher	*Rana areolata aesopus*	C2
Hartwrightia	*Hartwrightia floridana*	C2
Jay, Florida Scrub	*Aphelocoma coerulescens coerulescens*	T
Kestrel, Southeastern American	*Falco sparverius paulus*	C2
Manatee, West Indian	*Trichechus manatus latirostris*	E/CH
Mouse, Florida	*Podomys floridanus*	C2
Muskrat, Round-tailed	*Neofiber alleni*	C2
Rail, Black	*Laterallus jamaicensis*	C2
Rhododendron, Chapman's	*Rhododendron chapmanii*	E
Skipper, Eastern Beard Grass	*Atrutone arogos arogor*	C2
Snake, Eastern Indigo	*Drymarchon corais couperi*	T
Snake, Florida Pine	*Pituophis melanoleucus mugitus*	C2

FLORIDA

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES, AND CANDIDATE SPECIES

January 1994

Sparrow, Bachman's	*Aimophila aestivalis*	C2
Spiny-pod, Florida	*Matelea floridana*	C2
Squirrel, Sherman's Fox	*Sciurus niger shermani*	C2
Stork, Wood	*Mycteria americana*	E
Sturgeon, Shortnose	*Acipenser brevirostrum*	E
Sunflower, Lake-side	*Helianthus carnosus*	C2
Tortoise, Gopher	*Gopherus polyphemus*	C2
Woodpecker, Red-cockaded	*Picoides borealis*	E

FLORIDA NATURAL AREAS INVENTORY

1018 Thomasville Road, Suite 200-C • Tallahassee, Florida 32303 • (904) 224-8207

13 December 1994

Ms. Elva Peppers
Ecology and Environment, Inc.
1203 Governor's Square Blvd.
Tallahassee, FL 32301

Dear Ms. Peppers,

This letter is in reference to your request for information from the Florida Natural Areas Inventory (FNAI). Enclosed are the "Element Occurrence Records" of species found on the Baldwin, Fiftone and Marietta 7.5 minute U.S.G.S. quadrangles. Also enclosed is an element occurence explanation sheet and a rank explanation sheet defining the FNAI Global/State Ranking and Federal/State legal status of each element.

The quantity and quality of data collected by the Florida Natural Areas Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site specific field surveys. Many natural areas in Florida have never been thoroughly surveyed, and new species of plants and animals are still being discovered. **For these reasons, the FNAI cannot provide a definitive statement on the presence, absence or condition of biological elements in any part of Florida.** Florida Natural Areas Inventory reports summarize the existing information known to FNAI at the time of the request. **They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.**

Information provided by this data base may not be published without prior written notification to the Florida Natural Areas Inventory and FNAI must be credited as an information source in these publications. FNAI data may not be resold for profit.

I hope this information is of use to you. Please call if you have any questions or if I can be of further assistance to you.

Sincerely,

Susan Hortenstine
Research Assistant
Environmental Review

Enclosures

C:\SUE\INVOICE\DUVA.PEP

scientific name: VERBESINA HETEROPHYLLA
common name: VARIABLE-LEAF CROWNBEARD

grank: G2 federal status: C2
srank: S2 state status: N

date last observed:
county name: Duval

quad name: FIFTONE

township and range: 003S024E section: 26 precision: M
town/range comments:

general desc.: SANDHILL. ASSOCIATED SPECIES QUERCUS LAEVIS, Q. INCANA, SERENOA REPENS, ARISTIDA SPECIES AND SPOROBOLUS JUNCEUS.

EO data:

managed area name: CECIL FIELD NAVAL AIR STATION

owner: US: DOD
owner comments:

best source: ENVIRONMENTAL SERVICES AND PERMITTING. 1990. ENDANGERED SPECIES SURVEY AT THE JACKSONVILLE FLORIDA NAVAL COMPLEX.

eonum.: 003

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: SALPINGOSTYLIS COELESTINA
common name: BARTRAM'S IXIA

grank: G2 federal status: 3C
srank: S2 state status: LE

date last observed: 1990-06
county name: Duval

quad name: FIFTONE

township and range: 003S024E section: 34 precision: M
town/range comments: SW4 of NW4

general desc.:

EO data: Only one or a few plants seen.

managed area name: CECIL FIELD NAVAL AIR STATION

owner: U.S. Navy, U. S. Dept. of Defense
owner comments:

best source: Environmental Services and Permitting, Inc, P.O. Box 5489, Gainesville, FL 32602 (904/462-4334). Endangered species survey at the Jacksonville, Florida Naval Complex. 17 August 1990. Submitted to: Commanding officer, Southern Naval facillities engineering command (code 243), 2155 Eagle Drive, P.O. Box 10068, Charleston, SC 29411-0068.

eonum.: 061

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: CTENIUM FLORIDANUM
common name: FLORIDA TOOTHACHE GRASS

grank: G2 federal status: 3C
srank: S2 state status: N

date last observed:
county name: Duval

quad name: FIFTONE

township and range: 003S024E section: 35 precision: M
town/range comments:

general desc.: ECOTONE BETWEEN SLASH PINE PLANTATION AND SANDHILL. CANOPY COVER WAS LOW AND AREA SUBJECT TO PERIODIC CONTROLLED BURNING. ASSOCIATED PLANTS-SLASH PINE, PINELAND THREEAWN, FLORIDA THREEAWN, FLORIDA DROPSEED, SAND BLACKBERRY.

EO data:

managed area name: CECIL FIELD NAVAL AIR STATION

owner: US: DOD
owner comments:

best source: ENVIRONMENTAL SERVICES AND PERMITTING. 1990. ENDANGERED SPECIES SURVEY AT THE JACKSONVILLE FLORIDA NAVAL COMPLEX.

eonum.: 004

data sens.:

scientific name: DROSERA INTERMEDIA
common name: SPOON-LEAVED SUNDEW

grank: G5 federal status: N
srank: S3 state status: LT

date last observed:
county name: Duval

quad name: BALDWIN

township and range: 003S024E section: 08 precision: S
town/range comments:

general desc.: DRAINAGE DITCH. ASSOCIATED SPECIES: DROSERA CAPILLARIS, GRATIOLA RAMOSA, XYRIS ELLIOTTII, PANICUM HEMITOMON.

EO data:

managed area name: CECIL FIELD NAVAL AIR STATION

owner:
owner comments:

best source: ENVIRONMENT SERVICES AND PERMITTING. 1990. ENDANGERED SPECIES SURVEY AT THE JACKSONVILLE FLORIDA NAVAL COMPLEX.

eonum.: 039

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: AMBYSTOMA CINGULATUM
common name: FLATWOODS SALAMANDER

grank: G2G3 federal status: C2
srank: S2S3 state status: N

date last observed: 1982-02-20
county name: Duval

quad name: BALDWIN

township and range: 002S024E section: 29 precision: M
town/range comments: TRS GIVEN

general desc.: 1993: DENSE, UNBURNED PINUS ELLIOTTII PLANTATIONS OF VARYING AGES.

EO data: WHITE COLLECTED 1 ADULT-SIZED SPECIMEN (UNCAT., UF) ON 20 FEB 1982.

managed area name:

owner: (UNKNOWN)
owner comments: PERHAPS IN U.S. NAVAL AIR STATION: CECIL FIELD - RFN

best source: WHITE, D.J. 20 FEB 1982. SPECIMEN UNCAT. SM.

eonum.: 003

data sens.:

extreme NW corner of Yellow Water

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: ARISTIDA RHIZOMOPHORA
common name: FLORIDA THREEAWN

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1990-06
county name: Duval

quad name: BALDWIN

township and range: 002S024E section: 34 precision: M
town/range comments: NE4 of SE4

general desc.: Relatively dry flatwoods.

EO data: Grass is a dominant in flatwoods/pine plantation areas on the base.

managed area name: CECIL FIELD NAVAL AIR STATION

owner: U.S. Navy, U. S. Dept. of Defense
owner comments:

best source: Endangered species survey at the Jacksonville, Florida Naval Complex. 17 August 1990. Submitted to: Commanding officer, Southern Naval facillities engineering command (code 243), 2155 Eagle Drive, P.O. Box 10068, Charleston, SC 29411-0068. Submitted by: Environmental Services and Permitting, Inc., P.O. Box 5489, Gainesville, FL 32602 (904/462- 4334).

eonum.: 014

data sens.:

Yellow Water mar # 5

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: ARISTIDA RHIZOMOPHORA
common name: FLORIDA THREEAWN

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1990-06
county name: Duval

quad name: FIFTONE

township and range: 003S024E section: 34 precision: M
town/range comments: SE4 of NE4. SEE ALSO SECTION 35.

general desc.: Relatively dry flatwoods.

EO data: Grass is a dominant in flatwoods/pine plantation areas on the base.

managed area name: CECIL FIELD NAVAL AIR STATION

owner: U.S. Navy, U. S. Dept. of Defense
owner comments:

best source: Endangered species survey at the Jacksonville, Florida Naval Complex submitted to: Commanding officer, Southern Naval facillities engineering command (code 243), 2155 Eagle Drive, P.O. Box 10068, Charleston, SC 29411-0068. Submitted by: Environmental Services and Permitting, Inc., P.O. Box 5489, Gainesville, FL 32602 (904/462-4334).

eonum.: 012

data sens.:

Cecil Field mar # 13

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: ARISTIDA RHIZOMOPHORA
common name: FLORIDA THREEAWN

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1990-05-07
county name: Duval

quad name: BALDWIN

township and range: 002S024E section: 03 precision: M
town/range comments:

general desc.:

EO data: A dense colony under scattered Pinus palustris; associated plants: Aristida stricta [beyrichianal], Physostegia purpurea; sterile.

managed area name: WHITEHOUSE NAVAL OUTLYING FIELD

owner:
ner comments:

best source: Drummond, M. (s.n.) 1990. SF (206080).

eonum.: 016

data sens.:

Whitehouse mar # 6

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
12/12/94

scientific name: ARISTIDA RHIZOMOPHORA
common name: FLORIDA THREEAWN

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1990-06
county name: Duval

quad name: MARIETTA

township and range: 001S024E section: 35 precision: M
town/range comments:

general desc.: Relatively dry flatwoods.

EO data: Grass is a dominant in flatwoods/pine plantation areas on all portions of the base surveyed except Naval Air Station Jacksonville.

managed area name: WHITEHOUSE NAVAL OUTLYING FIELD

owner: U.S. Navy, U. S. Dept. of Defense
owner comments:

best source: Environmental Services and Permitting, Inc, P.O. Box 5489, Gainesville, FL 32602 (904/462-4334). Endangered species survey at the Jacksonville, Florida Naval Complex. 17 August 1990. Submitted to: Commanding officer, Southern Naval facillities engineering command (code 243), 2155 Eagle Drive, P.O. Box 10068, Charleston, SC 29411-0068.

eonum.: 015

data sens.:

OLF Whitehouse near runc 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
6620 Southpoint Drive, South
Suite 310
Jacksonville, Florida 32216-0912

FEB 17 1995

Brenda A. Powell, Project Biologist
Ecology and Environment, Inc.
1203 Governor's Square Blvd.
Tallahassee FL 32301

RE: Information on Listed Species, Cecil Field NAS

FWS Log No:	1-4-94-067F
Request Date:	February 7, 1995
Applicant:	Ecology and Environment, Inc.
Counties	Clay and Duval

Dear Ms. Powell:

This responds to your above referenced letter regarding federally threatened and endangered species that may be present within the areas specified. We are very much interested in any impacts that the closure of the Cecil Field NAS may have on listed species. Your survey methodology seems appropriate; however, specific information regarding "walkover" surveys may be necessary to evaluate the results. This would include the number of surveys conducted, time of day, season, or other pertinent information.

Additionally, you may want to include surveys for the flatwoods salamander (*Ambystoma cingulatum*) and Bachman's sparrow (*Aimophila aestivalis*), which are listed C2 candidate species. Knowledge of occurrence of any listed species would be important. A list of designated species for the counties specified was previously provided to Dr. Michael P. Losito (FWS Log. No. 1-4-95-067F).

If you have further questions, please contact Mr. Marc Epstein at 904-232-2580.

Sincerely yours,

Michael M. Bentzien

Michael M. Bentzien
Assistant Field Supervisor

Wildlife Research Laboratory
4005 South Main Street
Gainesville, FL 32601-9099
(904)955-2230 Fax(904)376-5359

March 7, 1995

Rick Whitney
ecology and environment, inc.
Buffalo Corporate Center
368 Pleasant View Drive
Lancaster, New York 14086

Dear Mr. Whitney:

None of the three shed skins that you sent came from indigo snakes. Skin number 1 appears to be a pine snake, *Pituophis melanoleucus*. Unfortunately, such diagnostic characters as the anal plate and head are missing or badly damaged, but the size, coloration, and scale row number pretty much rule out everything else. In any event, it is clearly not an indigo snake.

Skin 3 appears to be a coachwhip, *Masticophis flagellum*. The divided anal plate is sufficient to rule out indigo snake. Skin 2 may also be a coachwhip, or it could be a racer, *Coluber constrictor*, it's a bit too fragmented to really tell. As with the other two, though, it is clearly not from an indigo snake.

Give me a call if you have any questions.

Sincerely,

Paul E. Moler

Paul E. Moler
Biological Administrator I

WLD 9-3-5

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

August 15, 1995

Commanding Officer
Department of the Navy
Southern Division
Naval Facilities Engineering Command
Post Office Box 10068
Charleston, SC 294110068

In Reply Refer To:
Laura A. Kammerer
Historic Preservationist Supervisor
(904) 487-2333
Project File No. 952269

ATTN: Don Couch (203DC)

RE: Draft Report Review
Cultural Resources Assessment for Base Closure and Realignment, NAS Cecil Field, Jacksonville, Florida. Ecology and Environment, Inc., 1995
Duval County, Florida

Dear Commander:

In accordance with the procedures contained in 36 CFR, Part 800 ("Protection of Historic Properties"), we have reviewed the referenced draft inventory report and find it very thorough and sufficient. We note that 19 archaeological sensitivity areas were identified, one historic cemetery was recorded, and 533 buildings/structures were evaluated. Please ensure that your consultant includes a Survey Log Sheet and survey area map with the final copy (see attachment).

This office has reviewed the research and reconnaissance survey data submitted for the potential archaeological resources and concurs with the archaeologist's findings and recommendations regarding the 19 sensitivity areas that will require additional evaluation to identify resources eligible for listing in the *National Register of Historic Places*, and to eliminate areas that contain no archaeological resources.

In addition, we have reviewed the building survey data and the Historical Structure Forms and photographs submitted with the draft report. We concur with the findings and recommendations that none of the buildings/structures are eligible for listing in the National Register

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Klk
Enclosures (2)

D

Biological Assessment
Naval Air Station (NAS) Cecil Field, Jacksonville, Florida

Appendix D
Table of Contents

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List of Tables

List of Illustrations

1 Introduction

As required by Section 7 of the Endangered Species Act (ESA), this report discusses the potential occurrences of individuals and/or suitable habitat for federally endangered, threatened, and candidate animal and plant species (hereafter, species of concern) at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida that may be affected by the disposal and subsequent reuse of NAS Cecil Field. This report provides the appropriate federal and state agencies with sufficient information to understand the proposed action and its potential impacts on species of concern.

The United States Fish and Wildlife Service (USFWS) was consulted with regard to the occurrence of federally listed species of concern at NAS Cecil Field (Bentzien 1994) (see Attachment A). Certain species have been eliminated from further consideration in this report because they require habitats that do not occur at NAS Cecil Field (e.g. beach, mudflat, marine waters). The remaining federally listed species are included in this biological assessment (see Table D-1). Because the proposed disposal and reuse of NAS Cecil Field is a federal action, it is exempt from state regulations related to species of concern and is not required to include state listed species. However, most of the federally listed species discussed are also identified by the Florida Department of Environmental Protection (FDEP) the Florida Game and Freshwater Fish Commission (FGFWFC), and the Florida Department of Agriculture (FDA) as state endangered, threatened, or species of special concern.

It should be noted that USFWS revised its listings of federal species of concern in April 1996. Several of these species were included in this biological assessment. For purposes of this analysis, those species that still retained their state status are presented Table D-1.

Information and conclusions in this report are based on consultations with the USFWS, FGFWFC, Florida Natural Areas Inventory (FNAI), NAS Cecil Field personnel, and local experts; review of scientific and other literature; and previous species of concern field surveys conducted at NAS Cecil Field. In addition, a biological field survey for threatened and endangered species was conducted from February 21 to March 1, 1995, to

Table D-1

FEDERALLY LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR IN DUVAL AND CLAY COUNTIES

Species		Status	
Common Name	**Scientific Name**	**USFWS**	**FGFWFC/FDA[a]**
Mammals			
Florida Black Bear	*Ursus americanus floridanus*	Not listed[b]	T
Florida Mouse	*Podomys floridanus*	Not listed[b]	SSC
Sherman's Fox Squirrel	*Sciurus niger shermani*	Not listed[b]	SSC
Southeastern Big-Eared Bat	*Plecotus rafinesquii*	C2	Not listed
West Indian Manatee[b]	*Trichechus manatus latirostris*	E	E
Birds			
Wood Stork	*Mycteria americana*	E	E
Red-cockaded Woodpecker	*Picoides borealis*	E	T
Bald Eagle	*Haliaeetus leucocephalus*	T	T
Southeastern American Kestrel	*Falco sparverius paulus*	Not listed[b]	T
Bachman's Sparrow	*Aimophila aestivalis*	C2	Not listed
Florida Scrub Jay	*Aphelocoma coerulescens coerulescens*	T	T
Piping Plover[c]	*Charadrius melodus*	T	T
Reptiles and Amphibians			
Gopher Tortoise	*Gopherus polyphemus*	Not listed[b]	SSC
Eastern Indigo Snake	*Drymarchon corais couperi*	T	T
Florida Pine Snake	*Pituophis melanoleucus mugitus*	Not listed[b]	SSC
Florida Gopher Frog	*Rana aerolata*	Not listed[b]	SSC
Flatwoods Salamander	*Ambystoma cingulatum*	C2	Not listed
Green Sea Turtle[c]	*Chelonia mydas*	E	E
Kemp's Ridley Sea Turtle[c]	*Lepidochelys kempii*	E	E
Hawksbill Sea Turtle[c]	*Eretmochelys imbricata*	E	E
Leatherback Sea Turtle[c]	*Dermochrlys coriacea*	E	E
Loggerhead Sea Turtle[c]	*Caretta caretta*	E	E
Plants			
Southern Milkweed	*Asclepias viridula*	Not listed[b]	T

Key at end of table.

Table D-1

FEDERALLY LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR IN DUVAL AND CLAY COUNTIES

Species		Status	
Common Name	**Scientific Name**	**USFWS**	**FGFWFC/FDA[a]**
Curtiss' Sandgrass	*Calamovilfa curtissii*	Not listed[b]	T
Hartwrightia	*Hartwrightia floridana*	Not listed[b]	T
Lake-Side Sunflower	*Helianthus carnosus*	Not listed[b]	E
Florida Milkweed	*Matelea floridana*	Not listed[b]	E
Chapman's Rhododendron	*Rhododentdron chapmanii*	E	E
St. John's Susan	*Rudbeckia nitida*	Not listed[b]	E
Green Ladies-Tresses	*Spiranthes polyantha*	Not listed[b]	E
Variable-Leaf Crownbeard	*Verbesina heterophylla*	Not listed[b]	T
Fish			
Shortnose sturgeon[c]	*Acipenser brevirostrum*	E	E

[a] The Florida Game and Fresh Water Fish Commission's status has been provided for the federally listed species only. Additional state listed species may occur in the area; however, those species are not considered part of this biological assessment.

[b] Previously listed as a C2 species by the USFWS; removed in April 1996.

[c] Eliminated from further evaluation based on their habitat requirements and the lack of these habitats at NAS Cecil Field.

Key:

C2 = Candidate Species for federal listing with some evidence of vulnerability, but for which not enough information exists to justify listing.
E = Endangered. A species in danger of extinction throughout all or a significant portion of its range.
FDA = Florida Department of Agriculture.
FGFWFC = Florida Game and Fresh Water Fish Commission.
SSC = Species of Special Concern.
T = Threatened. A species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
USFWS = United States Fish and Wildlife Service.

Source: Bentzien 1994; FGFWFC 1996

supplement and update the previous field investigations conducted at NAS Cecil Field. This survey was performed by experienced biologists from Ecology and Environment, Inc. (E & E) and the Southern Division, Naval Facilities Engineering Command (SOUTHDIV), and the results have been incorporated into this report. The following sections discuss the species habitat requirements, survey methodology, survey results, potential impacts and mitigation, and conclusions. In addition, a list of references used during the preparation of this report is provided in Section 7.

2 Species Descriptions

Twenty-seven federally listed species of concern may occur in the proposed project area including five mammal, seven bird, five reptile and amphibian, and 10 plant species. To determine whether the project area supports individuals or suitable habitat for any of these species of concern, an extensive amount of existing scientific literature was reviewed, and consultations with local/regional experts were conducted (prior to the field survey) to identify the life history and habitat requirements for each species. This section provides a brief description of the species distribution/range, habitat needs (foraging and breeding), and other biological requirements.

2.1 Mammals

Brief descriptions of the life histories and habitat requirements are presented below for the five mammal species of concern that may occur in the proposed project area: Florida black bear, Florida mouse, Sherman's fox squirrel, round-tailed muskrat, and southeastern big-eared bat.

2.1.1 Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear was formerly a federal candidate species and is a state-threatened species that is a subspecies of the widespread black bear (*Ursus americanus*). At full size, this large mammal is approximately 5 feet long, 2 to 3 feet high at the shoulder, and weighs 200 to 475 pounds. Black bears are primarily nocturnal, solitary animals that den beneath roots, in a hollow log or tree, or wherever there is shelter. Their diet includes a mixture of berries, nuts, tubers, insects, small mammals, eggs, honey and carrion (Burt and Grossenheider 1976).

The Florida black bear is distributed intermittently throughout Florida, and southern Alabama and Georgia. There are five large conservation areas in Florida with apparently

stable populations: Eglin Air Force Base, Apalachicola National Forest, Ocala National Forest, Osceola National Forest, and Big Cypress National Preserve (Cox *et al.* 1994).

Primary habitat types used by black bears include pine flatwoods, hardwood swamp, cypress swamp, cabbage palm forest, sand pine scrub, and mixed hardwood hammock, although other habitats are also used (Maehr 1992; Cox *et al.* 1994). Forested wetlands are preferentially utilized over pine flatwoods in the Osceola National Forest, which is located approximately 30 miles west of NAS Cecil Field (Maehr 1992). Black bears have been known to disperse long distances (Maehr *et al.* 1988), but less than 70% of the recorded dispersal events are greater than 35 miles in distance (Cox *et al.* 1994).

2.1.2 Florida Mouse (*Podomys floridanus*)

The Florida mouse was formeraly federal candidate species and is a state-listed species of special concern. This large mouse closely resembles more common species of white-footed mice (*Peromyscus* spp.), except that the eyes, ears, and hind feet are comparatively larger (Layne 1992). The major distinguishing external characteristic is the different foot morphology compared to *Peromyscus* spp. This nocturnal mouse has white feet, a long tail, and is usually tawny or brown on the back and head. The Florida mouse primarily feeds on acorns and various other nuts and berries (Burt and Grossenheider 1976).

The Florida mouse is distributed only in the big bend area and central portion of Florida; its range in northeastern Florida extends only into central Clay County, and does not include Duval County (Layne 1992). Suitable habitats are restricted to fire-maintained, xeric vegetation on well-drained, sandy soils. Scrub and, to a lesser extent, sandhill are the two major habitats of this species (Layne 1992). The habitat preference is apparently related to the greater consistency of acorn production in scrub habitat compared to sandhill habitat and other xeric areas. Burrows of gopher tortoises, particularly in sandhill habitats, are frequently used by the Florida mouse for shelter/cover and breeding (Layne 1992).

2.1.3 Sherman's Fox Squirrel (*Sciurus niger shermani*)

The Sherman's fox squirrel was formerly federal candidate species and is a state-listed species of special concern, and it is a subspecies of the widely distributed fox squirrel (*Sciurus niger*). It is characterized by variable body coloration ranging from all dark to all tan, with intermediate coloration. The head is typically black with a white nose and ears (Kantola 1992). Pine seeds are the principal summer food source, and acorns constitute the

bulk of the fall diet (Weigl *et al.* 1989). Pine buds, flowers, bulbs, maple samaras, fungi, and insects also comprise portions of fox squirrel diets at various times of the year.

The Sherman's fox squirrel ranges from central Georgia to southeastern Florida west to Walton County (Cox *et al.* 1994). The Sherman's fox squirrel's distribution is intimately dependent on the availability of a year-round food source. Therefore, areas vegetated with pines and turkey, southern red, blackjack, and bluejack oaks are preferred. Of secondary importance to fox squirrel distribution is habitat structure. Mature longleaf pine-turkey oak sandhill is the primary habitat of the Sherman's fox squirrel (Kantola 1992), although it may occur in other habitats with sufficient food supplies, nesting sites, and open ground cover (Wiegl *et al.* 1989; Wooding 1995). Areas with a sparse understory and ground cover are considered important because they permit unhindered movement and decrease cover for predators (Wooding 1995).

2.1.4 Southeastern Big-Eared Bat (*Plecotus rafinesquii*)

The southeastern big-eared bat, or Rafinesque's big-eared bat, is a federal candidate species that is characterized by its very long ears. This medium-sized bat has long and silky fur. Tips of the hairs on the upper parts are gray, those on the underparts are white. These bats feed after dark and primarily consume moths and other insects caught in the air or gleaned from vegetation (Humphrey 1992).

This bat species is distributed from Indiana to Virginia, and from eastern Oklahoma to Texas (Belwood 1992). In Florida, it is limited to the northern half of the peninsula and the panhandle area. Florida is considered the southernmost part of its range. In general, there is very little information regarding the distribution of this bat species in Florida (Humphrey 1992).

The southeastern big-eared bat is restricted to forested areas, such as hardwood hammocks and pine flatwoods in Florida (Moore 1949; Jennings 1958). Old buildings, shacks, tree hollows, and crevices serve as roosts during the summer months. Whether they migrate is unknown, but they hibernate in caves during the winter months (Belwood 1992; Humphrey 1992).

2.2 Birds

Brief descriptions of the life histories and habitat requirements are presented below for the seven bird species of concern that may occur in the proposed project area: wood stork,

red-cockaded woodpecker, bald eagle, southeastern American kestrel, Bachman's sparrow, Florida scrub jay, and black rail.

2.2.1 Wood Stork (*Mycteria americana*)

The wood stork is a state- and federally listed endangered bird species with a wing span of up to 5.5 feet. Plumage is white with black flight feathers and a large, dark gray, naked head which easily distinguishes it in flight from similar species such as the white ibis and cranes (Peterson 1980). Freshwater fish from 2 to 10 inches long constitute the majority of the wood stork's diet (Ogden *et al.* 1976).

The wood stork's range includes much of the southern United States into Mexico, Central America, and South America. Aerial surveys conducted from the 1960s to 1980s indicated three important trends in wood stork distribution: a northward shift in relative densities of wood stork nesting activities; an increased proportion of nesting activity in manmade impoundments compared to cypress swamps; and greater use of coastal areas for colony location (Ogden 1985).

Wood storks are typically found in marshes, swamps, mangroves, and streams. They prefer to feed in drying pools, ditches, and swampy depressions where low water levels result in concentrations of small fish (Ogden 1985). Nesting occurs in colonies, or rookeries, typically located in cypress or mangrove swamps, although tall trees in standing water of manmade impoundments and other hardwood species in swamps are also used (Ogden 1985). Nests are preferably located far out on an upper horizontal limb of a large cypress (Ehrlich *et al.* 1988). Nests are constructed of sticks and have been described as "flimsy platforms" (Ehrlich *et al.* 1988) and "large bulky platforms" (Ogden 1985).

2.2.2 Red-Cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is a federally listed endangered species and a state-threatened species. This relatively small woodpecker (approximately 7 inches long) has a solid black nape and cap, ladder back pattern, and large white cheek patches (Robbins *et al.* 1983). Wood-boring beetles and grubs constitute the bulk of its diet, but berries, fruit and seeds are occasionally consumed.

The nearest reported colonies to NAS Cecil Field are located in the Cary State Forest (Powell 1995), which is located approximately 6 miles north; Camp Belding, which is located 9 miles south; and Osceola National Forest, which is located approximately 26 miles northwest (Cox *et al.* 1994). In a study in North Carolina, the average fledgling and adult

dispersal distances from their places of birth were less than 8 and 2 miles, respectively (Walters *et al.* 1988).

The breeding and foraging habitat requirements, behavior, social organization, population dynamics, and locations of virtually all breeding sites is well documented (Hooper and Lennartz 1981; DeLotelle *et al.* 1983; Jackson 1986; Lennartz *et al.* 1987; Walters *et al.* 1988; Cox *et al.* 1994). In general, this species typically occurs in large (approximately 200 to 300 acres), relatively open, mature pine forests where it excavates nesting cavities in longleaf pines that are 95-100 years old and loblolly pines that are 75-80 years old (Jackson *et al.* 1979; Jackson 1986). Studies have indicated that frequent fires (3-5 years) are required to suppress understory hardwood growth that makes an area unsuitable for this species (Jackson 1986). Suitable breeding and foraging habitat is very limited in the southeast, and the amount of habitat has declined severely over the last 60 years as a result of timber harvesting practices (Jackson 1986).

2.2.3 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a state- and federally listed threatened species that is easily distinguished by the adult's white head and tail. Immature eagles are brown and mottled irregularly with white until their fourth year. This large bird is approximately 32 inches long and has a wing span greater than 6 feet. Fish is the primary food item of the bald eagle, but small mammals (especially rabbit), waterfowl, and carrion are occasionally consumed (Ehrlich *et al.* 1988).

Although the bald eagle is distributed throughout Canada, the United States, and parts of Mexico (Green 1985), Florida supports the greatest number of bald eagle nests. In 1982, approximately 340 (23%) of the 1,482 nests in the United States were located in Florida, indicating the importance of this state to the eagle (Green 1985). Aerial surveys from 1991 to 1992 recorded over 800 nests in Florida, with concentrations around Lake George and St. John's River (Cox *et al.* 1994). Several nests have been observed in Clay County.

Bald eagles usually congregate along the coast, as well as rivers and lakes located in open areas where there is a plentiful food source and nesting/roosting sites. Nests consist of large sticks and are located in large, sturdy trees that have a clear flight path and high visibility of surrounding areas. Nests are usually located within 2 miles of large bodies of water, and the vast majority within 0.5 mile (Green 1985).

2.2.4 Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel was formerly a federal candidate and is state threatened subspecies of the widespread American kestrel (*Falco sparverius sparverius*). This brightly colored falcon has two black streaks on each side of the head (moustaches), a blue-gray patch encircling a rufous spot on top of the head, and a distinctive rufous coloration on its back. In general, the southeastern American kestrel is the size of a robin, but the males are slightly smaller than the females (Layne and Smith 1992). The major prey items of the southeastern kestrel are large insects (grasshoppers and beetles), small rodents, reptiles (especially lizards), and occasionally birds (Wiley 1978).

The southeastern American kestrel has been reported to breed from southern portions of Louisiana, Mississippi, Alabama, Georgia, and South Carolina. It is considered a year-round resident of the southeastern coastal plain, including virtually all of Florida except for the extreme southern tip. In Florida, the wintering range of the more common American kestrel overlaps with the permanent range of the southeastern American kestrel (Wiley 1978).

The southeastern American kestrel prefers open habitats such as pastures, grasslands, and open longleaf pine-turkey oak sandhill communities (Bohall-Wood and Collopy 1986). In general, the preferred habitat must provide an area with short vegetation with scattered perches for optimum foraging, an adequate prey base, and suitable nest sites. Kestrels foraging behavior includes perching on trees in and adjacent to open habitats, and hovering and dropping onto their prey (Wiley 1978; Ehrlich *et al.* 1988). Kestrels are considered secondary nesters, and typically utilize cavities excavated by woodpeckers (Wiley 1978; Ehrlich *et al.* 1988). Although suitable natural nesting sites likely limit the population sizes and distribution of the southeastern American kestrel, they will occupy man-made boxes within a variety of habitats (Hoffman 1983).

2.2.5 Bachman's Sparrow (*Aimophila aestivalis*)

The Bachman's sparrow is a federal candidate species. It is a relatively large sparrow (up to 6 inches) with a characteristic buffy breast and a reddish brown striped back (Peterson 1980). It can be distinguished from similar sparrows by the yellow bend of the wing and the dark upper mandible (Robbins *et al.* 1983). Bachman's sparrows forage almost exclusively at ground level on seeds of grasses, sedges, and forbs, although small insects are occasionally consumed (Allaire and Fisher 1975; Ehrlich *et al.* 1988).

It ranges throughout the southeast and Appalachian states into Illinois (Peterson 1980). During the early 1900s, the Bachman sparrow's range expanded into the northern and

northwestern parts of its current range in response to the creation of open habitats (clearcuts) resulting from logging operations (Ehrlich *et al.* 1988; Dunning and Watts 1990). Since the 1930s, the expansion of this sparrow's range has been reversed. Consequently, breeding activity is now considered rare in the northeastern portion of its range, and populations throughout its range appear to be declining (National Geographic Society 1987; Ehrlich *et al.* 1988).

The Bachman's sparrow typically inhabits dry, open pine or oak woods, especially mature longleaf pine forests, scrub palmetto, and brushy pastures (Peterson 1980; National Geographic Society 1987; Dunning and Watts 1990). In addition, it has been reported to occur in agricultural and abandoned fields in the northern portion of its range (Clayton 1969; Dorsey 1976). The apparent contradiction between use of mature pine woods and open fields indicates the importance of microhabitat in determining local distributions of Bachman's sparrow. In South Carolina, Bachman's sparrows were found to occupy a variety of habitat types including mature longleaf pine stands (80 to 120 years old), middle-aged stands (22 to 50 years old), and one- to three-year old clear cuts (Dunning and Watts 1990). Although differing notably in forest structure, these areas all contained significant amounts of vegetation in the ground layer (0 to 3 feet high) and relatively little development of understory vegetation (6 to 12 feet high).

In general, forest management practices can significantly affect habitat structure and, consequently, microhabitat suitability for the Bachman's sparrow. For example, the management practice of controlled burning every 3 to 5 years will enhance growth of ground layer vegetation including grasses and forbs, and diminish understory growth. Similarly, frequent thinning of understory trees promotes growth of ground layer vegetation by permitting high levels of light penetration, thereby providing foraging habitat (Dunning and Watts 1990).

2.2.6 Florida Scrub Jay (*Aphelocoma coerulescens coerulescens*)

The Florida scrub jay is a state and federally listed threatened species. It is a relatively large (12-inch long) jay that lacks the characteristic crest and white-tipped wing and tail feathers of the more common blue jay (*Cyanocitta cristata*). It can be distinguished by its white throat and necklace of blue feathers, as well as a white line over each eye. The head and wings are blue, and its back is olive-gray in color (Robbins *et al.* 1983; Woolfenden 1978). The Florida scrub jay feeds on a variety of invertebrates, especially insects, as well as small vertebrates such as frogs and lizards. In the fall and winter acorns form the bulk of their diet (Woolfenden 1978).

Scrub jays range over much of western United States and Mexico, but the unique Florida scrub jay is restricted to peninsular Florida. The original range of this species has been significantly reduced by the spread of suburbs, citrus groves, and agricultural activities. The current distribution of the Florida scrub jay consists of scattered and often small populations, since the sedentary nature of the bird makes natural repopulation unlikely (Woolfenden 1978).

The Florida scrub jay has extremely specific habitat requirements: it resides in oak scrub areas consisting of live oak, myrtle oak, saw palmetto, and sand palmetto; and it avoids wet habitats and forests (Woolfenden 1978). Nests are typically constructed in low shrubs and/or saplings and consist of twigs and grasses (Ehrlich *et al.* 1988). In general, the creation of forest openings, in areas where suppression of natural fires has resulted in unnatural closed-canopy forests, improves the Florida scrub jay's foraging and breeding habitat (Woolfenden 1978).

2.3 Reptiles and Amphibians

Brief descriptions of the life histories and habitat requirements are presented below for the five reptile and amphibian species of concern that may occur in the proposed project area: eastern indigo snake, gopher tortoise, Florida pine snake, Florida gopher frog, and flatwoods salamander.

2.3.1 Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise was formerly a federal candidate species and is a state species of special concern. It is a large, terrestrial tortoise with an average carapace length of 9 to 11 inches (Christman 1992). The rigid, unhinged plastron is dull yellow and the carapace is usually brown or tan. It forages on grass, leaves, and fruits or berries if they are available (Conant and Collins 1991). Foraging generally occurs within 50 meters of the burrow (Christman 1992).

The gopher tortoise is limited to six states in the southeastern coastal plain, and includes all parts of Florida (Christman 1992). A 1994 field study conducted at NAS Cecil Field estimated gopher tortoise populations at the Main Station and Yellow Water areas to be approximately 1319 and 12 individuals, respectively (CZR, Inc. 1994).

The gopher tortoise is typically associated with sandhill communities, but it also inhabits a variety of dry and somewhat mesic habitats including disturbed habitats such as runway aprons, roadsides, and old fields. It digs characteristic crescent-shaped burrows,

usually with a broad apron of sand, which provide protection against temperature extremes, desiccation, and predators (Christman 1992). The burrows slope downward from the surface and then usually level off underground. An excavated burrow may be as long as 35 feet (Conant and Collins 1991). Several other species including insects, owls, raccoons, opossums, frogs, and snakes seek shelter or permanently reside in the burrows (Christman 1992). Of particular importance are the eastern indigo snake, Florida mouse, Florida pine snake, and Florida gopher frog, all of which utilize gopher tortoise burrows for refuge or shelter (Cox *et al.* 1987).

2.3.2 Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake is a state and federally listed threatened species. It is the longest snake in North America and commonly grows to lengths of 7 feet (Conant and Collins 1991). Adults are uniformly colored black or bluish-black throughout, although there is a distinctive reddish or orange tinge on the throat and chin. However, specimens collected in northern Florida typically have only a light pinkish blush on the throat (Moler 1992). Prey items include fish, frogs, toads, lizards, snakes, small turtles, birds, and small mammals (Conant and Collins 1991; Moler 1992).

The eastern indigo snake is limited in range to Florida and south Georgia (Lawler 1977; Diemer and Speake 1983), but its range may extend into southern Alabama (Moler 1985a) and possibly Mississippi (Conant and Collins 1991). It usually inhabits dry uplands such as sandhills dominated by longleaf pine and turkey oak (Lawler 1977; Diemer and Speake 1983). The majority of indigo snake sightings in Georgia and western Florida are in sandhill communities, especially those near major streams (Diemer and Speake 1983; Moler 1985b). However, in peninsular Florida, indigo snakes inhabit a variety of habitats from xeric uplands to mangrove swamps (Moler 1985b; Moler 1992). In general, indigo snakes in the northern part of their range typically associate with drier habitats, whereas in the southern parts of their range they commonly associate with more mesic areas (Carr 1940; Kochman 1978; Diemer and Speake 1983; Moler 1985b; Moler 1992).

The eastern indigo snake's habitat use also varies according to seasons. In the winter months, the indigo snake occupies sandhill communities where it typically associates closely with gopher tortoise burrows (Carr 1940; Lawler 1977). However, in low-lying areas such as coastal hydric hammocks, crayfish and rodent burrows and hollow root channels are used as winter dens/burrows (Moler 1985b). Studies suggest that these burrows provide shelter against desiccation (Bogert and Cowles 1947 Kochman 1978) and cold (Bogert and Cowles 1947). On warm, sunny winter days when the temperature rises above approximately 55°F,

indigo snakes often bask near the mouths of gopher tortoise burrows (Moler 1994). The indigo snake becomes more active in mid-March when the temperature tends to remain above 55°F (Moler 1994) and the use of mesic and wetland habitats increases (Moler 1992). Similar to the use of burrows during the winter months, the increased use of mesic areas in the summer may be related to the avoidance of desiccation, as well as prey abundance (Kochman 1978; Moler 1992).

2.3.3 Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake was formerly a federal candidate species and is a state species of special concern. This large, 36- to 90-inch, stocky snake is usually tan or rusty-brown in color with an indistinct pattern (Conant and Collins 1991; Franz 1992). Its head and snout are somewhat conical in shape. When disturbed, the aggressive Florida pine snake is known to hiss loudly. Ground-dwelling birds and their eggs, pocket gophers, and mice are their major food sources (Franz 1992).

The Florida pine snake's range is restricted to the Atlantic and Gulf Coastal Plains, from southeastern South Carolina to south Florida, and west to the Florida panhandle (Franz 1992). It occupies xeric, sandy areas including longleaf pine-oak woodlands, sand pine scrub, sandhills, and old fields on former sandhills. During drought conditions, the pine snake is more likely to inhabit open areas around wetlands (Franz 1992). The Florida pine snake is an excellent burrower, and will burrow into loosely packed sand or into the burrows and tunnel systems of pocket gophers (*Geomys pinetis*) and gopher tortoises (Landers and Speake 1980; Franz 1992).

2.3.4 Florida Gopher Frog (*Rana capito aesopus*)

The Florida gopher frog was formerly a federal candidate species and is a state species of special concern. It is a small 2- to 4-inch frog characterized by a stubby body with short legs, an enormous head and mouth, and prominent eyes. Its typically light ground color can vary from creamy white to brown through various shades of yellow or purple (Conant and Collins 1992; Godley 1992). This nocturnal frog primarily consumes invertebrates, toads, and frogs (Godley 1992).

The gopher frog's distribution closely parallels that of the gopher tortoise and is limited to the southeastern coastal plain, including Florida. However, unlike the gopher tortoise, the gopher frog does not occur on coastal islands or dunes (Godley 1992).

Xeric upland habitats, particularly longleaf pine-turkey oak sandhill communities, appear to be the principal habitat of the gopher frog (Godley 1992). The gopher frog is dependent upon the gopher tortoise's burrows for shelter, but may occupy other burrows associated with rodents or crayfish. Breeding occurs in seasonally flooded, grassy ponds and cypress swamps that lack fish populations (Godley 1992). Consequently, the gopher frog is usually found in areas of suitable foraging habitat and/or shelter that is located within one mile of appropriate breeding grounds (Godley 1992).

2.3.5 Flatwoods Salamander (*Ambystoma cingulatum*)

The flatwoods salamander is a federal candidate species and a state endangered species. This salamander is silvery gray to black, with irregular brown or black mottles on the tail, head, side, and back (Conant and Collins 1991; Ashton 1992). The long and slender larvae are black with yellow or white lines, and have fragile tail fins and very slender legs (Ashton 1992). These salamanders eat live earthworms and other invertebrates (Conant and Collins 1991).

The flatwoods salamander is distributed in a relatively small area of the southeastern coastal plain from southern South Carolina, across Georgia, to southern Alabama, and south to the northern part of peninsular Florida (Conant and Collins 1991). This salamander is found throughout the Florida panhandle (Ashton 1992).

The flatwoods salamander occurs in longleaf or slash pine-wire grass flatwoods located adjacent to wetlands such as cypress swamps, roadside ditches, and marshy pasture ponds (Anderson and Williamson 1976; Ashton 1992). In addition, a lack of fish species that prey on eggs or larvae is an important breeding site factor (Ashton 1992). Eggs are deposited in the fall or early winter on vegetation which becomes submerged, or nearly so, during late winter and spring rains (Collins and Conant 1991; Palis 1995). Little is known of about the biology of adult flatwood salamanders, although the association with wiregrass appears to be critical (Palis 1995).

2.4 Plants

Brief descriptions of the physical characteristics, distribution, and habitats are presented below for 10 plant species of concern that may occur in the proposed project area: incised groove-bur, southern milkweed, Curtiss' sandgrass, hartwrightia, lake-side sunflower, Florida milkweed, Chapman's rhododendron, St. John's Susan, green ladies-tresses, and variable-leaf crownbeard.

2.4.1 Southern Milkweed (*Asclepias viridula*)

The southern milkweed was formerly a federal candidate species and is a state threatened species that is a member of the milkweed family (Asclepiadaceae). This perennial herb has narrow, opposite leaves and a slender, wand-like stem that is purplish at the base. The whitish green or yellowish flowers consist of five petals and a purplish mid-rib, and bloom from April through July. This milkweed is usually found in clearings dominated by grasses and sedges, or in areas sparsely vegetated with slash and longleaf pine and saw palmetto. The preferred substrate consists of fine sand which remains moist or wet for most of the year (USDA 1983). Prescribed burning and the subsequent reduction of competitive shrub species benefit this species, as does cutting or thinning the overstory vegetation (USDA 1983).

2.4.2 Curtiss' Sandgrass (*Calamovilfa curtissii*)

Curtiss' sandgrass was formerly a federal candidate species and is a state endangered species. This erect or ascending perennial grass has dull green, narrow leaf blades and can grow to a height of approximately 3 feet. The inflorescence is narrow with short, numerous, strongly ascending, and somewhat overlapping branches (Clewell 1985). The solitary floret has silvery-silky erect hairs and is present in the summer months (USDA 1983). It is found in a few eastern counties in the Florida panhandle (Clewell 1985; USDA 1983), and is an inhabitant of moist or sandy slash and longleaf pine-saw palmetto flatwoods (USDA 1983). This plant responds well to fire management practices that open the overstory and reduce populations of competitive shrub/herbaceous species (USDA 1983).

2.4.3 Hartwrightia (*Hartwrightia floridana*)

Hartwrightia was formerly a federal candidate species and is a state-threatened species that is a member of the composite family (Asteraceae). This aromatic perennial herb can grow to a height of 1 to 3 feet. The alternate lower leaves are 5 to 15 inches long and oblong in shape, and the upper leaves are small and linear. The flowers are pale lavender to white or pink and are produced in many-flowered heads (Clewell 1985; USDA 1983) from October to November (USDA 1983). Hartwrightia is distributed in southeastern Georgia, and southward to select counties of southern peninsular Florida. The primary habitat is mesic and wet slash or longleaf pine-saw palmetto flatwoods, grass-sedge dominated bogs, seepage slopes, baygalls, and mesic clearings (USDA 1983). This species benefits from periodic natural or prescribed fires that remove competing shrub and grass species (USDA 1983).

2.4.4 Lake-Side Sunflower (*Helianthus carnosus*)

The lake-side sunflower was formerly a federal candidate species and is a state endangered species that is a member of the composite family. This perennial sunflower can grow to a height of approximately 3 feet. Its leaves are opposite and are 3 to 6 inches long toward the base, but become progressively smaller and fewer towards the inflorescence. The distinctive bright yellow flowers are present in the late summer and fall (USDA 1983). This particular sunflower is restricted to northeastern Florida and is typically found in moist to wet pinelands with relatively open overstories and understories, or grass-sedge dominated openings. Prescribed burning favors the development of this species by reducing the abundance of competitive shrub and tree species (USDA 1983).

2.4.5 Florida Milkweed (*Matelea floridana*)

The Florida milkweed was formerly a federal candidate species and is a state-endangered species that is a member of the milkweed family. This perennial, milky-juiced herb is a somewhat prostate or climbing vine, not an erect herb. It is generally 3 to 6 feet long, but it can grow to a length of approximately 15 feet. The pubescent leaves are opposite in arrangement and ovate to suborbicular in shape (USDA 1983). It produces pale maroon or yellowish-green flowers from late May to July, and a spiny seed pod after flowering (Clewell 1985; USDA 1983). It is distributed in the northern and central portions of the Florida peninsula, and may occur in mesic hammocks or dry mixed upland and hardwood forests. The preferred substratum is usually a moist to dryish sandy loam, and the best flowering populations appear to be where there has been recent disturbance (i.e., fire, logging, etc.) (USDA 1983).

2.4.6 Chapman's Rhododendron (*Rhododendron chapmanii*)

Chapman's rhododendron is a state and federally listed endangered species that is similar in appearance to ornamental rhododendrons. This bushy evergreen shrub can grow to a height of approximately 6 feet. The leaves are alternate, elliptic, or obviate in shape, and somewhat scaley on the underside. The rose-colored flowers consist of five petals fused together to form a funnel-shaped bloom that is present in March and April (USDA 1983). Chapman's rhododendron is known to occur in northern Florida, southwestern Georgia, and southeastern Alabama. It occurs in mesic flatwoods and seepage slope areas that have moist to wet, highly organic sandy soils. Typically it occurs in open areas located along the edge of longleaf pine-turkey oak woodlands. This shrub is a prolific sprouter and can produce rather large colonies from a single parent plant (USDA 1983). Periodic burning is a part of its

natural ecological setting and generally creates an abundance of new growth sprouts/shoots (USDA 1983).

2.4.7 St. John's Susan (*Rudbeckia nitida*)

St. John's Susan was formerly a federal candidate species and is a state-endangered species that resembles the common black-eyed Susan (*Rudbeckia hirta*). This perennial herb has a stout, erect stem that forms small clumps of this plant. The yellow-green leaves are alternate or basal and elliptically shaped. The flowers consist of many small, deep purplish-brown disc flowers in the center, and 8 to 12 yellow ray petals that encircle the disc flowers (USDA 1983). Flowering usually occurs from June to August. St. John's Susan is distributed throughout the coastal plain, including the panhandle and northern portions of peninsular Florida (Clewell 1985; USDA 1983). It typically occurs in wet to moist acidic clearings in flatwoods and low savannas. Periodic burning helps to maintain areas of preferred habitat (USDA 1983).

2.4.8 Green Ladies-Tresses (*Spiranthes polyantha*)

This delicate orchid (Orchidaceae) was formerly a federal candidate species and is a state endangered species. It is characterized by the greenish-brown flowers that appear in February and March and are arranged spirally along the stem. It typically occurs in rocklands, hammocks, and upland mixed forest. Very little is known about the distribution and biology of this rare orchid (Clewell 1985).

Variable-Leaf Crownbeard (*Verbesina heterophylla*)

The variable-leaf crownbeard was formerly a federal candidate species and is a state threatened species that is a member of the composite family. This plant's leaves are usually opposite or whorled at or below the midstem, and alternate towards the inflorescence. The leaves are generally ovate shaped with the base of the leaf extending down around the stem as a wide wing (Clewell 1985). *Verbesina sp.* flowers consist of a white central disc surrounded by yellow ray petals (Radford *et al.* 1968; USDA 1983), and bloom in early summer (USDA 1983). The variable-leaf crownbeard typically occurs in the dry pine flatwoods or open savannas of eastern peninsular Florida (USDA 1983).

3 Methodology

This section identifies the various sources of information, previous studies/surveys, and new surveys conducted at NAS Cecil Field that were used to determine the occurrence of the federal species of concern that may occur in the proposed project area. In order to prepare the species descriptions, identify the data gaps, and determine the most appropriate field survey techniques the United States Fish and Wildlife Service (USFWS), Florida Game and Fresh Water Fish Commission (FGFWFC), Florida Natural Areas Inventory (FNAI), NAS Cecil Field personnel, and local experts were consulted. In addition, the following species of concern surveys conducted at Cecil Field were reviewed:

- Endangered (Plant) Species Survey at the Jacksonville, Florida Naval Complex (Environmental Services and Permitting [ESP], Inc. 1990);
- Cecil Field Gopher Tortoise Survey and Management Plan (CZR, Inc. 1994); and
- Amphibian Breeding Site Description (Palis 1995a; Palis 1995b).

The following sections briefly describe the methodology of the threatened and endangered species survey conducted by Ecology and Environment, Inc. (E & E) and SOUTHDIV biologists between February 21 to March 1, 1995. The surveys were conducted to determine the occurrence of individuals or suitable habitat for the following species:

- Eastern indigo snake (*Drymarchon corais couperi*);
- Florida pine snake (*Pituophis melanoleucus mugitus*);
- Florida gopher frog (*Rana capito aesopus*);
- Florida mouse (*Podomys floridanus*);
- Red-cockaded woodpecker (*Picoides borealis*);

- Bachman's sparrow (*Aimophila aestivalis*); and
- Wood stork (*Mycteria americana*).

These species were selected based on contacts with the USFWS (Epstein 1995) and SOUTHDIV (Burst 1995). The eastern indigo snake was the principal species for which surveys were conducted, although occurrences of individuals and suitable habitats of the other species were recorded. The 10 federally listed plant species were not included in the survey because it was determined that the survey conducted by ESP in 1990 adequately addressed the occurrence of rare plants in the proposed project area. Similarly, the gopher tortoise was not directly included in the survey because the survey conducted by CZR, Inc. in 1994 thoroughly covered the proposed project area. In addition, the Florida black bear, Sherman's fox squirrel, round-tailed muskrat, southeastern big-eared bat, southeastern American kestrel, black rail, and flatwoods salamander were not considered part of the survey because they were or are presently only candidate species and are not federally protected. The bald eagle was not included in the survey because it is only a transient species that does not permanently reside in the proposed project area. Similarly, the Florida scrub jay was not included in the survey since this species is restricted to peninsular Florida and is not likely to occur at NAS Cecil Field due to its sedentary nature (Woolfenden 1978). However, if any of the federally listed species identified in Table D-1 were observed or heard during the field survey, their location and abundance was reported.

3.1 Habitat Characterizations

Areas of potentially suitable habitat for the species associated with gopher tortoise burrows (see Section 2) were initially identified according to the *Cecil Field Gopher Tortoise Survey and Management Plan* (CZR, Inc. 1994). Areas of potentially suitable habitat for the red-cockaded woodpecker, Bachman's sparrow, and wood stork were initially identified according to the forestry section of the *Natural Resources Management Plan for Cecil Field* (Navy 1992). These areas of potentially suitable habitat were then further characterized to determine actual habitat suitability for each species of concern.

Gopher tortoise burrows identified during the survey by CZR, Inc. were considered areas of potentially suitable habitat for the eastern indigo snake, Florida mouse, pine snake, and gopher frog. Areas considered potentially suitable habitat for the three bird species of concern were based on a preliminary assessment of the forest stand type and age at NAS Cecil Field. In particular, areas of slash, loblolly, and/or longleaf pines originating at least

50 years ago were identified as potentially suitable habitat for the red-cockaded woodpecker; cypress stands at least 50 years old were identified as potentially suitable habitat for wood stork breeding colonies; and areas of dry open pine (longleaf) or oak forests were identified as potentially suitable habitat for Bachman's sparrow.

During the E & E/SOUTHDIV field survey, areas of potentially suitable habitat were further characterized by identifying dominant plant species in the overstory, understory, shrub, vine, and herbaceous strata; visually estimating the approximate percent cover and height of vegetation in each strata; and, estimating the average diameter-at-breast-height (dbh) of the overstory trees. General soil types and conditions were noted and further described based on the county soil surveys. Additional observations of common species, or the spatial arrangement and plant species composition of adjacent cover types, were also noted. General weather conditions and temperatures at the time of the field survey and the preceding evening were recorded. Field data sheets of each area of potentially suitable habitat surveyed are on file with SOUTHDIV.

3.2 Species Surveys

Based on the identification and field characterization of the areas of potentially suitable habitats, an assessment regarding the actual suitability of the area as suitable habitat was completed. Based on this assessment and the identification of areas of suitable habitat, specific search surveys were conducted for individuals of the species of concern. The following provides a brief description of the survey techniques and rationale for the seven species of concern surveyed.

3.2.1 Eastern Indigo Snake

As discussed in Section 2.3, the eastern indigo snake is closely associated with gopher tortoise burrows during the winter months. Consequently, the eastern indigo snake survey was limited to those areas where suitable gopher tortoise habitat had been identified by CZR, Inc. (1994). However, based on the marginal eastern indigo snake habitat or exceptionally dense ground cover of saw palmetto which prohibited visual surveys beyond a few feet, eight areas of suitable gopher tortoise habitat could not be surveyed.

Survey methodology was based on the FGFWFC's Wildlife Methodology Guidelines and conversations with Paul Moler, an eastern indigo snake expert. The surveys involved scoping the burrows or searching the areas for basking snakes. In the mornings, when the ambient air temperatures were below 60°F, gopher tortoise burrows were investigated using a

fiber optic scope to determine the presence of indigo snakes. Although the field team attempted to scope the entire length of each burrow, occurrences of gopher tortoises, roots, or other obstructions restricted the investigation of some burrows. When the temperature was greater than 55°F, areas of suitable gopher tortoise habitat were visually surveyed for basking or active snakes.

Survey efforts varied according to the vegetative density of each habitat and its suitability for use by the eastern indigo snake. The field team members (surveyors) placed themselves at 15- to 45-foot intervals and traversed the areas of suitable habitat. Distances between the surveyors sometimes varied according to the vegetative density of each habitat. For example, areas with relatively open ground cover permitted a greater distance between the surveyors, whereas more densely vegetated habitats required smaller intervals between the surveyors. In addition, the amount of time spent surveying an area was based on the relative density of burrows and suitability for use. The field team members recorded the number of active, inactive, and abandoned burrows encountered.

3.2.2 Florida Pine Snake, Florida Gopher Frog, and Florida Mouse

These three species are closely associated with gopher tortoise burrows (see Section 2). Therefore, the same survey methodology used for the eastern indigo snake was determined appropriate for assessing the occurrence of these species at NAS Cecil Field.

3.2.3 Red-Cockaded Woodpecker

As previously discussed, areas of potentially suitable habitat for this woodpecker consist of older (at least 50 years old) slash, loblolly and/or longleaf pines (see Section 2.2). Therefore, these areas were visually surveyed for the presence of individual woodpeckers and/or the distinctive cavity trees used by a nesting colony. In addition, habitat characteristics that likely restrict or diminish the habitat suitability of these areas and potential management techniques/efforts that may increase the habitat suitability of these areas were recorded.

3.2.4 Bachman's Sparrow

This sparrow typically inhabits relatively open, dry pinelands and open palmetto scrub (see Section 2.2). Because this habitat is widespread at NAS Cecil Field, the field survey was limited to areas in which the sparrow had been previously observed on base. A NAS Cecil Field natural resource manager at NAS Cecil Field reported observing Bachman's sparrows near Gate 11 along the eastern side of the air strip (Cochran 1995). Consequently, this area

was surveyed for approximately two hours on two separate mornings. During the field surveys, all bird species observed or heard at NAS Cecil Field were identified and reported.

3.2.5 Wood Stork

Wood stork colonies are usually located in cypress stands that are at least 50 years old (see Section 2.2). Four cypress swamps located in the Yellow Water area were surveyed for evidence of individual storks and/or nesting colonies. These areas/swamps were described in terms of their habitat characteristics including plant species composition, percent cover, soils, water, and available snag/nesting trees.

4 Results

This section provides a brief discussion of the potential occurrence of the twenty-seven federally listed species of concern in the proposed project area. The potential occurrence of each species is based on a comparison of their habitat requirements (breeding and foraging) with on-site field surveys (CZR 1994; ESP 1990; Palis 1995; E & E/SOUTHDIV 1995) and scientific/expert consultations and literature. Potential habitat for a total of 13 species of concern were identified during the field surveys and are shown on Figure D-1. In addition, the occurrences of individual species of concern are identified on this figure.

4.1 Mammals

The following provides a brief discussion of the occurrence of potential habitat at NAS Cecil Field for the five federally listed mammal species identified by USFWS (see Table D-1).

4.1.1 Florida Black Bear

No individuals or signs (i.e., tracks, dens, scat, etc.) of the Florida black bear were observed during the E & E/SOUTHDIV field survey. In addition, the black bear has not been reported at NAS Cecil Field or adjacent areas (FNAI 1994). The nearest areas to NAS Cecil Field that contain significant black bear populations and extensive suitable habitat are the Ocala National Forest, which is located approximately 43 miles south, and the Osceola National Forest, which is located approximately 26 miles northwest (Cox *et al.* 1994). Black bear sightings are also frequent in Durbin Swamp and Twelve-Mile Swamp in southeastern Duval and northern St. John's counties, respectively (Cox *et al.* 1994).

In general, NAS Cecil Field does not provide any unique or significant areas of potential habitat for the black bear (Cox *et al.* 1994), and is only considered to provide marginal habitat for transient individual bears. In addition, since most black bears do not typically disperse more than 35 miles, it is unlikely that the Florida black bear will leave

areas of suitable habitat and establish populations at NAS Cecil Field where there is only marginal habitat. In addition, dispersal of the Florida black bear from the nearest existing population to NAS Cecil Field would be extremely difficult because major highways/roads would need to be traversed.

4.1.2 Florida Mouse

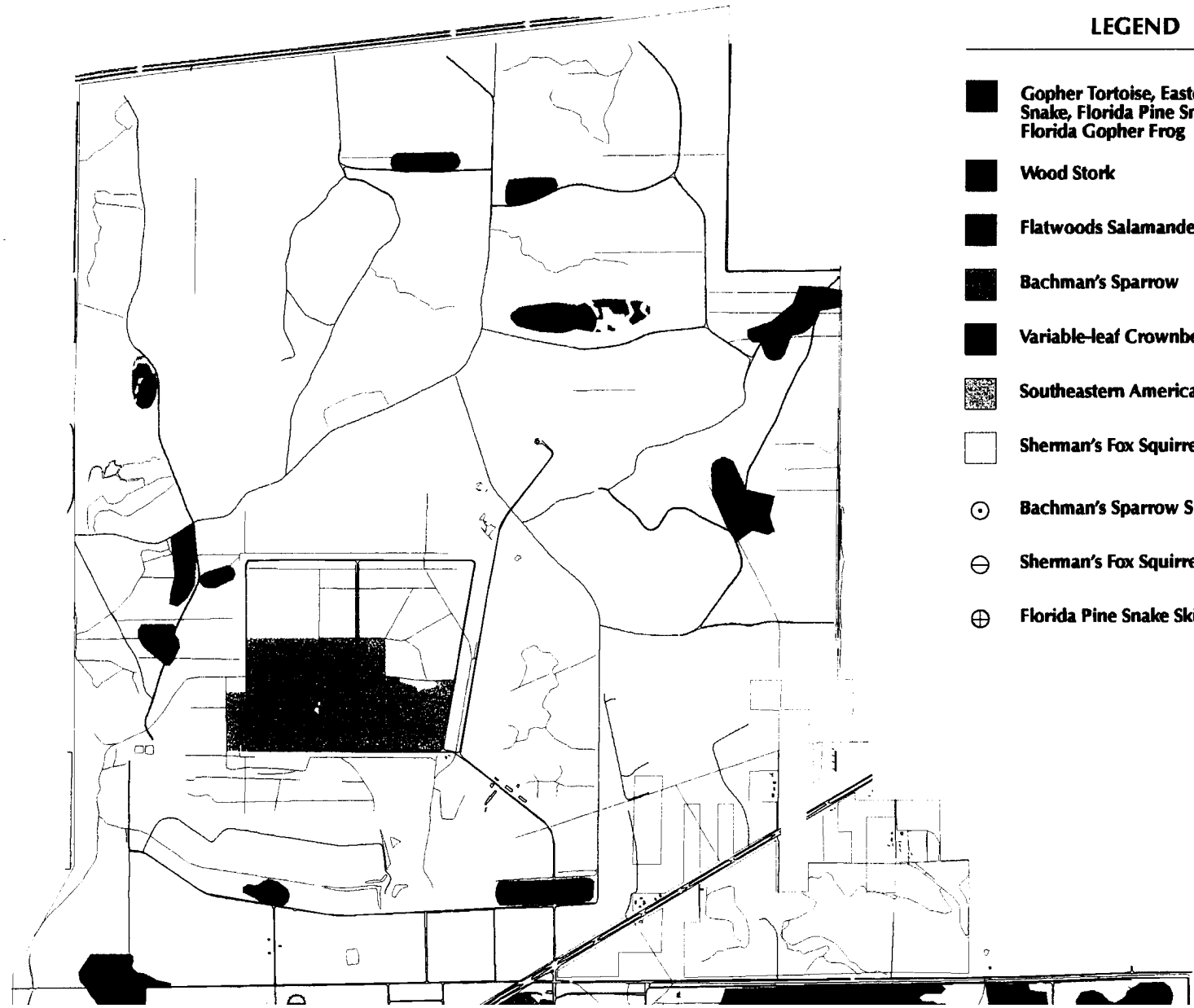
No individuals or signs of the Florida mouse were observed during the E & E/ SOUTHDIV field survey. In addition, the Florida mouse has not been reported at NAS Cecil Field or adjacent areas (FNAI 1994). Although much of the Main Station provides suitable habitat (gopher tortoise burrows), the range of the Florida mouse does not include Duval County, and only includes the southern half of Clay County (Lane and Smith 1992). Also, the Florida mouse typically occurs in scrub oak habitat with sufficient acorn production: sandhill communities are considered less important.

In general NAS Cecil Field does not provide suitable habitat for the Florida mouse. Although there are numerous gopher tortoise burrows located throughout the base, areas of preferred habitat (scrub oak) do not occur at NAS Cecil Field. Therefore, it is highly unlikely that the Florida mouse occurs at NAS Cecil Field.

4.1.3 Sherman's Fox Squirrel

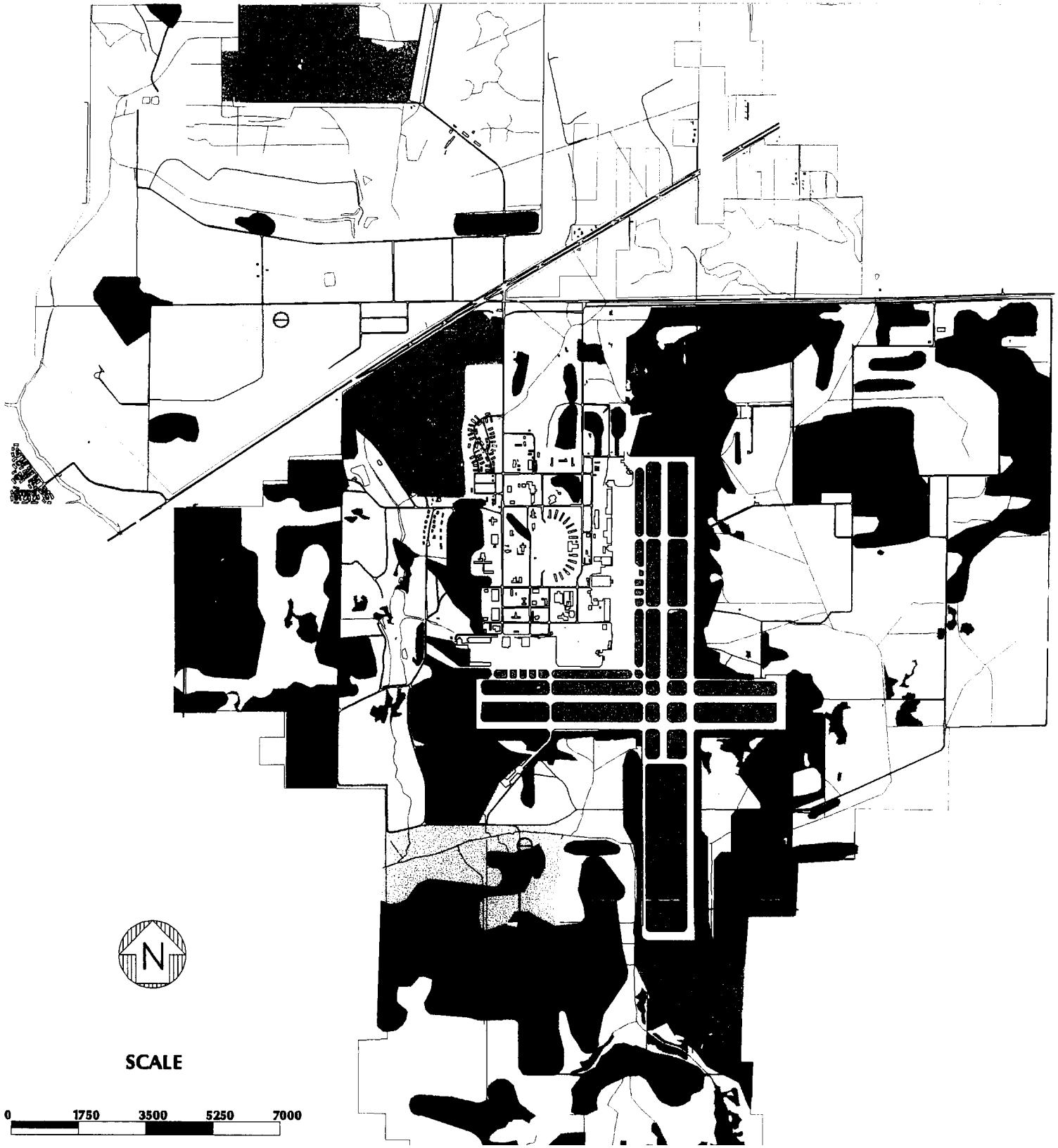
Three individual Sherman's fox squirrels were observed during the E & E/ SOUTHDIV field survey. Two individuals occurred in the sandhill habitat and adjacent slash pine plantation along Perimeter Road in the southeastern portion of Main Station, and the third individual was observed along Mariner Street in the southwestern portion of Yellow Water. This fox squirrel primarily relies on acorns as a fall food source and pine seeds in the summer (Weigl *et al.* 1989). In addition, a relatively open ground cover is an important component of suitable fox squirrel habitat (Wooding 1995).

In general, NAS Cecil Field provides suitable habitat for the Sherman's fox squirrel. In particular, areas of the Main Station that contain both pine and oak habitats and have little ground layer development are considered suitable habitat for the Sherman's fox squirrel. Although the Yellow Water Area is primarily composed of relatively mesic slash pine and wetland habitats, the observed presence of one individual in this area indicates that others likely occur in the vicinity (see Figure D-1).



LEGEND

- Gopher Tortoise, Eastern Indigo Snake, Florida Pine Snake, and Florida Gopher Frog
- Wood Stork
- Flatwoods Salamander
- Bachman's Sparrow
- Variable-leaf Crownbeard
- Southeastern American Kestrel
- Sherman's Fox Squirrel
- Bachman's Sparrow Sighting
- Sherman's Fox Squirrel Sighting
- Florida Pine Snake Skin Collection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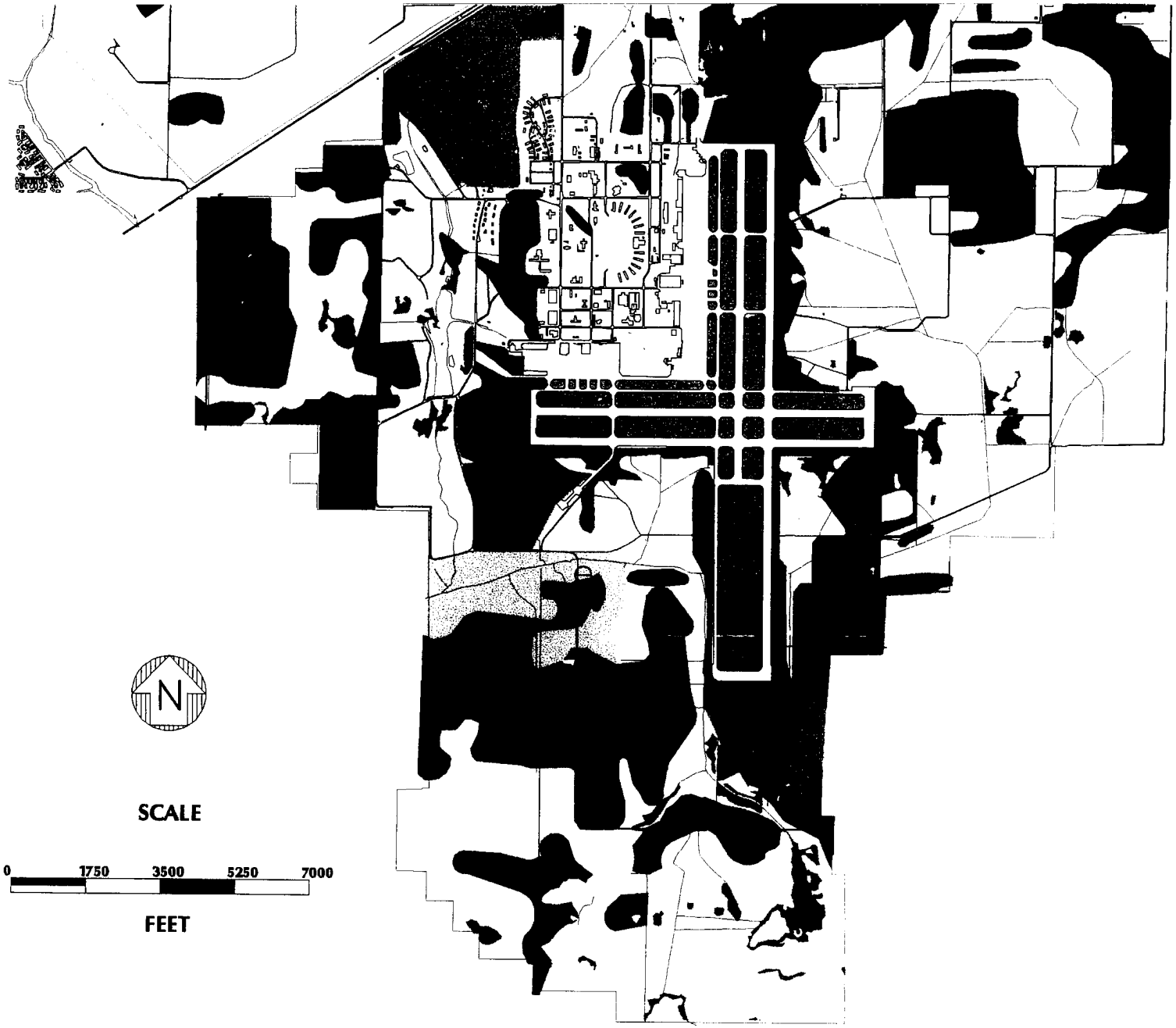

Source: ESP 1990; CZR 1994; Ecology and Environment, Inc. 1996

(3)

FIGURE D-1 SUITABLE HABITAT MAP FOR SPECIES OF CONCERN - MAIN STATION / YELLOW WATER

4.1.4 Southeastern Big-Eared Bat

No individuals or signs of southeastern big-eared bats were observed during the E & E/SOUTHDIV field survey, and this species has not been reported at NAS Cecil Field or adjacent areas (FNAI 1994). This bat requires old buildings and tree hollows for roosting habitat, and caves for winter hibernation. However, because the forested areas at NAS Cecil Field are actively managed for timber, tree hollows and/or snags that primarily occur in older trees are not likely to occur at the station. In addition, there are no caves at NAS Cecil Field.

In general, NAS Cecil Field does not provide any areas of suitable summer or winter habitat for the southeastern big-eared bat. Therefore, it is unlikely that this species occurs at NAS Cecil Field.

4.2 Birds

The following provides a brief discussion of the occurrence of potential habitat at NAS Cecil Field for the seven federally listed bird species identified by the USFWS (see Table D-1).

Wood Stork

Four cypress-dominated wetlands at the Yellow Water Area were identified and characterized during the E & E/SOUTHDIV field survey: no individuals or signs of wood storks were observed. These cypress areas are dominated by immature bald cypress which are approximately 60 feet high. The crowns of the trees are relatively narrow and closed, and the branches did not support any wood stork nesting activity. Although, the forested nature of some wetlands may diminish their forage value, the scrub-shrub and emergent wetlands are easily accessed by wood storks and are considered more important foraging habitat than the forested areas. Wood storks have been reported to feed in Lake Fretwell when the water level is sufficiently low, and in a roadside ditch located along 103rd Street (Cochran 1995).

In general, NAS Cecil Field does not provide suitable habitat for wood stork nesting colonies, but does provide suitable foraging habitat (see Figure D-1). The cypress swamps are only considered marginal nesting habitat, but the numerous and extensive wetlands located throughout NAS Cecil Field provide suitable foraging habitat due to their relatively low level of disturbance, and the presence of standing and/or flowing water.

Red-Cockaded Woodpecker

The preliminary habitat characterization identified 10 areas of potentially suitable nesting habitat at NAS Cecil Field: no individuals or signs of woodpeckers were observed. However, two of the areas characterized are considered potentially suitable habitat for the red-cockaded woodpecker if managed properly.

One area consists of approximately 32-acres of 60-year-old longleaf pine and is located along "D" Avenue, just east of the golf course. The pines are scattered, approximately 40- to 50-feet high, and range in diameter-at-breast-height (dbh) from eight to 18 inches. The understory is relatively open, and the ground layer consists primarily of saw palmetto, *Aristida*, and some blackberry. In addition, sizeable areas on the golf course consist predominantly of loblolly pine that are more than 50 years old. However, the understory in these areas is well developed and would require fire maintenance or thinning/clearing before it could be considered suitable habitat. Therefore, with appropriate management and time, this area could also provide red-cockaded woodpeckers with suitable habitat.

The other area of potential habitat is an approximately 120-acre stand of slash pine located in the southwest corner of the Yellow Water Area. The relatively open overstory consists of slash pines that are approximately 70 feet high and 10 to 20 inches dbh. The understory consists primarily of scattered water oak and slash pine saplings, and the ground cover is gallberry and saw palmetto (approximately 80% cover). Overall, the overstory tree structure is sufficient to support red-cockaded woodpecker breeding or foraging activity, although extensive management (i.e., burning of the understory and shrub layers) would be necessary to optimize the area's suitability.

It is unlikely that the red-cockaded woodpecker will utilize these areas at NAS Cecil Field because the land uses surrounding these two areas of NAS Cecil Field are not suitable for red-cockaded woodpecker activity; the areas are relatively small; and no woodpeckers are known to occur at NAS Cecil Field (FNAI 1994; Powell 1995). The nearest reported colonies occur in Cary State Forest (Powell 1995), which is located 6 miles north of the Yellow Water Area. It is possible that NAS Cecil Field could act as a dispersal/travel corridor between Cary State Forest and Camp Blanding (located 9 miles south of Main Station). However, this is unlikely based on the marginal suitability of habitats at the station and the distance (24 linear miles) between Cary State Forest and Camp Blanding. In a study in North Carolina, the average fledgling and adult dispersal distances from their places of birth were less than 8 and 2 miles, respectively (Walters *et al.* 1988).

In general, NAS Cecil Field does not provide any unique or significant areas of suitable habitat for the red-cockaded woodpecker, and is only considered to provide marginal

habitat. In order for red-cockaded woodpeckers to colonize habitats at NAS Cecil Field, not only would potentially suitable habitats at the station need to be improved, either through natural processes or management, but suitable habitats would have to exist between the station, Cary State Forest and/or Camp Blanding. Therefore, it is unlikely that NAS Cecil Field could provide anything more than marginal habitat for the red-cockaded woodpecker.

Bald Eagle

No individuals or signs of the bald eagle were observed during the E & E/ SOUTHDIV field survey. In addition, the bald eagle has not been reported at NAS Cecil Field (FNAI 1994). Bald eagles usually nest near large bodies of water (Green 1985), but will forage in a variety of different habitats (ponds, streams, and lakes). Some of the wetlands at NAS Cecil Field maintain standing water throughout the year and support fish populations that provide prey for transient eagles. Therefore, based on the presence of extensive wetlands in the Yellow Water Area, it is possible that eagle foraging activity could occur at NAS Cecil Field. Likewise, Lake Fretwell may serve as an occasional foraging habitat.

In general, NAS Cecil Field does not provide suitable breeding/nesting habitat for the bald eagle. However, the wetland areas located throughout the station provide suitable foraging habitat for local or transient bald eagles.

Southeastern American Kestrel

No individuals or signs of the southeastern American kestrel were observed during the E & E/SOUTHDIV field survey. In addition, the southeastern American kestrel has not been reported at NAS Cecil Field (FNAI 1994), although the more common American kestrel has been observed during the winter and early spring (Epstein 1996; Cochran 1995a; Powell 1995). The southeastern American kestrel prefers open areas with short vegetation and scattered perches for optimum foraging; and trees with previously excavated cavities for nesting.

In general, NAS Cecil Field provides suitable foraging habitat around the airstrips and golf course on Main Station. In addition, the scattered forested stands in the Yellow Water Area that have recently been harvested, and the open field areas provide suitable foraging habitat (see Figure D-1).

Bachman's Sparrow

Two individual Bachman's sparrows were observed during the E & E/SOUTHDIV field survey (see Figure D-1): and this sparrow has been reported to occur at the station (FNAI 1994). One individual was observed east of the southern section of the north-south runway, outside of the perimeter fence near Gate 11. The habitat in this area consists of cut-over palmetto scrub surrounded by planted slash pine (Gillman Paper Co. property), and open longleaf pine and palmetto habitat. The second individual was heard singing in a planted slash pine forest located southwest of the east-west runway. In addition, three or four individual Bachman's sparrows have been observed in these locations at other times (Cochran 1995; Powell 1995).

Overall, the present forestry management plan helps maintain suitable habitat in various locations throughout the station. By selectively harvesting forested stands of varying age, the management plan creates habitats with an open understory and scattered adult and sapling trees, especially pines, which is the primary habitat for the Bachman's sparrow. As a given stand begins to develop into a more densely forested area, its value as breeding or foraging habitat begins to decrease. However, other suitable habitats are created when nearby stands are then harvested. As a result, areas suitable habitat are constantly generated.

In general, NAS Cecil Field provides suitable habitat for the Bachman's sparrow. Much of the pinelands at the facility, especially the south and west sides of the Main Station, can be considered suitable habitat provided that the present management scheme is continued. In addition, the presence of the Branan Field Mitigation Bank, which is adjacent to the southeast side of the Main Station, provides additional suitable habitat. NAS Cecil Field and the adjacent park constitute a sizeable area of suitable habitat for the Bachman's sparrow and other species requiring dry, open pinelands.

Florida Scrub Jay

No individuals or signs of the Florida scrub jay were observed during the E & E/SOUTHDIV field survey. In addition, this scrub jay has not been reported at NAS Cecil Field (FNAI 1994). The Florida scrub jay has extremely specific habitat requirements: it prefers oak scrub areas with low vegetation for nesting and avoids wet habitats (Woolfenden 1978). Therefore, based on the general lack of oak dominated communities at the station and the abundance of wetland areas, it is unlikely that the Florida scrub jay occurs at NAS Cecil Field.

In general, NAS Cecil Field does not provide suitable habitat for the Florida scrub jay. Although the openings created by the harvesting of timber benefit the scrub jay, these

areas are dominated with pine saplings rather than the preferred oak. Therefore, the limited areas of oak and brushland habitats present at the station are considered to provide only marginal habitat for the Florida scrub jay.

4.3 Reptiles and Amphibians

The following provides a brief discussion of the occurrence of potential habitat at NAS Cecil Field for the five federally listed reptiles and amphibians identified by the USFWS (see Table D-1).

4.3.1 Gopher Tortoise

Several gopher tortoises were observed during the E & E/SOUTHDIV field survey. In addition, the survey conducted by CZR, Inc. in 1994 also identified several gopher tortoises at Yellow Water and the Main Station. Based on their survey results, the Main Station supports a larger number of individuals than Yellow Water. The limited area of suitable habitat and small estimated population size at the Yellow Water Area is due to the relatively high amount of wetlands and generally more mesic conditions compared to the Main Station, which is slightly more elevated and drier. The greatest population densities at the Main Station occur in the west end of the east-west runway where there are approximately 1.43 individuals per acre; west of the south end of the north-south runway and east of the perimeter fence where there are approximately 1.33 individuals per acre; and in the southeast portion of the base where there are approximately 1.17 individuals per acre (CZR, Inc. 1994). In addition, the Brannan Field Mitigation Bank, which is located adjacent to the southeast portion of the station, and is managed by FGFWFC as gopher tortoise habitat. Collectively, the Main Station and the mitigation park constitute a large area of excellent habitat for the gopher tortoise.

In general, NAS Cecil Field provides suitable habitat for the gopher tortoise. The Main Station currently supports a large population of tortoises and the Yellow Water area provides habitat for a relatively smaller population. There are approximately 3,075 and 245 acres of suitable gopher tortoise habitat at the Main Station and the Yellow Water Area, respectively (see Figure D-1), and the estimated population sizes in these two areas are 1319 ($\pm$167) and 12 ($\pm$14) individuals, respectively (CZR, Inc. 1994).

4.3.2 Eastern Indigo Snake

No individuals or signs of the eastern indigo snake were observed during the E & E/ SOUTHDIV field survey, and no indigo snakes have been reported at the station (FNAI 1994; Cochran 1995). Thirty habitat locations were identified and characterized as potential habitat prior to the field survey. Twenty-two of these areas were surveyed by E & E/SOUTHDIV, and a total of 92 gopher tortoise burrows (in seven different areas) were examined internally using the fiber optic scope. In addition, three shedded snake skins were collected and sent to Paul Moler, an eastern indigo snake expert with the Florida Department of Fish and Game, for identification. None of these snake skins was determined to be from the eastern indigo snake (Moler 1995).

During winter months, suitable habitat for the eastern indigo snake coincides with gopher tortoise habitat (i.e., dry upland areas), which is abundant at NAS Cecil Field (especially at the Main Station). During warmer months the indigo snake is reported to occur in a wide variety of habitats including wetlands (Moler 1985b; Moler 1992). In northeastern Florida, most sighting records and museum specimens are from coastal areas of Nassau, Duval, and St. John's counties, although there are three pre-1970 sightings were recorded in the central portions of the two former counties (Moler 1985a). Three post-1970 sightings were recorded in central western Clay County.

In general, NAS Cecil Field provides suitable habitat for the eastern indigo snake (see Figure D-1). Based on the indigo snake's apparent preference for large, unsettled areas (Conant and Collins 1991) and the presence of extensive upland and wetland habitats at the station, it is possible that the indigo snake occurs at NAS Cecil Field.

4.3.3 Florida Pine Snake

No individuals or signs of the Florida pine snake were observed during the E & E/ SOUTHDIV field survey, and the pine snake has not been reported at NAS Cecil Field (FNAI 1994). However, one of the shedded snake skins collected during the field survey and sent to Paul Moler for identification appears to be from a pine snake. Moler noted "such diagnostic characters as the anal plate and head are missing or badly damaged, but the size, coloration, and scale row number pretty much rule out everything else" and that the "skin appears to be a pine snake (*Pithuophis melanoleucus*)" (Moler 1995).

In general, NAS Cecil Field provides suitable habitat for the Florida pine snake (see Figure D-1). Based on the pine snake's close association with the gopher tortoise, areas identified as suitable gopher tortoise habitat can also support the Florida pine snake. In

particular, areas of longleaf pine-oak woodlands or open/old fields around wetland areas are considered suitable habitat for the pine snake (Franz 1992).

4.3.4 Florida Gopher Frog

No individuals or signs of the Florida gopher frog were observed during the E & E/ SOUTHDIV field survey. In addition, the gopher frog has not been reported at the station or adjacent areas (FNAI 1994). However, the gopher frog's small size, cryptic coloration, and reclusive nature make observation of this species difficult. Therefore, based on the association between this species and gopher tortoise burrows, and the presence of numerous gopher tortoise burrows, it is possible that the gopher frog occurs at the station.

In general, NAS Cecil Field provides suitable habitat for the Florida gopher frog (see Figure D-1). In particular, upland longleaf pine-turkey oak sandhill communities that have gopher tortoise burrows and are located in proximity to seasonally flooded wetland areas are capable of supporting the gopher frog (Godley 1992).

4.3.5 Flatwoods Salamander

No individuals or signs of the flatwoods salamander were observed during the E & E/ SOUTHDIV field survey. Although FNAI records indicate that a single adult flatwoods salamander was collected in Section 29 of Baldwin quadrangle in 1982, it is uncertain whether this collection was within NAS Cecil Field (FNAI 1994). An additional survey conducted in 1993 did not reveal the presence of potential breeding sites in Section 29 (Palis 1995a); two potential breeding sites were located in Section 32, which is adjacent and south of Section 29. These sites were surveyed for the larvae of flatwoods salamanders in March 1995 and no larvae or adults were encountered (Palis 1995a). However, it should be stated that 1995 was a poor year for flatwoods salamander reproduction throughout northern Florida because of low rainfall (Palis 1995b).

In general, NAS Cecil Field provides limited areas of suitable habitat for the flatwoods salamander (see Figure D-1). Although it is possible that this species breeds in the wetlands at the of Yellow Water Area, the current forestry management plan does not promote the maintenance of suitable habitat (Anderson and Williamson 1976; Ashton 1992). Periodic prescribed burning would significantly diminish the typically dense shrub layer of the pine forests, thereby allowing increased growth of wiregrass, which is crucial to successful salamander reproduction (Palis 1995b).

4.4 Plants

The plant survey conducted by ESP at NAS Cecil Field revealed the presence of one state listed species, the variable-leaf crownbeard (1990). This species was found in sandhill habitat near the west side of the southern end of the north-south runway of the Main Station (see Figure D-1). Additional individuals may occur in other dry pineland areas throughout the Main Station and Yellow Water areas.

In general, NAS Cecil Field provides suitable habitat for all of the currently and formerly federal plant species of concern. The extensive dry pine and hardwood habitats, particularly at the Main Station, may provide habitat for the southern milkweed, Florida milkweed, Curtiss' sandgrass, and green ladies-tresses. Mesic and wet habitats, especially the pine and hardwood wetlands of the Yellow Water Area, may provide habitat for hartwrightia, lake-side sunflower, St. John's Susan, and Chapman's rhododendron.

Seventeen other federally listed plant species of concern (nine of which are also state listed), and 13 state listed species of concern (lacking federal status) were also considered in the plant species survey conducted at NAS Cecil Field and NAS Jacksonville. None of the federally listed species were observed at NAS Cecil Field during the survey; and, only one state listed threatened species, the spoon-leaved sundew (*Drosera intermedia*), was found in a small ditch in the southwestern section of the Yellow Water Area (ESP 1990).

5 Impacts and Mitigation

This section provides a summary of the potential impacts to federal species of concern as a result of the disposal and subsequent reuse of NAS Cecil Field, and identifies mitigative measures that could minimize these potential impacts. A determination of the effect of the proposed project on each species of concern is provided (see Table D-2). Although, the Navy's proposed disposal of the station would not result in any negative impacts to federally listed species of concern, the subsequent reuse by other entities may result in negative effects to species of concern. However, during the Navy's disposal and closure activities at NAS Cecil Field, management activities at the station will be conducted in accordance with a natural resource management plan prepared by the USFWS. This plan will be designed to mitigate potential effects of activities conducted during the disposal process (e.g., environmental remedial actions), therefore no effects to species of concern are anticipated.

Upon completion of the federal actions necessary to finalize the disposal of NAS Cecil Field to other entities (e.g., other federal agencies and the local community), the station property would be available for redevelopment activities. The local community, through CFDC, has adopted a base reuse plan for the station property. This plan will be subsequently adopted as amendments to the Jacksonville and Clay County Comprehensive Plan, following review and approval by the Florida Department of Community Affairs, in accordance with the state's local comprehensive plan regulations. The plan includes civilian reuse of airfield facilities at the station and future development of industrial and commercial uses at the Main Station and Yellow Water Area. A substantial portion of the property will continue to be used for forestry activities or converted to passive recreation/conservation.

Following plan adoption, land development regulations will be adopted to govern land use activities at the station property, consistent with the reuse plan and comprehensive plan amendments (e.g., zoning, site plan review). In addition, all development would be subject to existing development policies and regulations currently in effect in Jacksonville and Clay counties (e.g., wetlands, floodplains and conservation policies). For industrial and

Table D-2

SUMMARY OF RESULTS AND IMPACTS TO FEDERALLY LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR AT NAS CECIL FIELD

Species		Presence of Suitable Habitat	Potential Impacts
Common Name	**Scientific Name**		
Mammals			
Florida Black Bear	*Ursus americanus floridanus*	No	No effect
Florida Mouse	*Podomys floridanus*	No	No effect
Sherman's Fox Squirrel	*Sciurus niger shermani*	Yes	Minor effect
Southeastern Big-Eared Bat	*Plecotus rafinesquii*	No	No effect
Birds			
Wood Stork	*Mycteria americana*	Yes	No effect
Red-cockaded Woodpecker	*Picoides borealis*	No	No effect
Bald Eagle	*Haliaeetus leucocephalus*	No	No effect
Southeastern American Kestrel	*Falco sparverius paulus*	Yes	Minor effect
Bachman's Sparrow	*Aimophila aestivalis*	Yes	Minor effect
Florida Scrub Jay	*Aphelocoma coerulescens coerulescens*	No	No effect
Reptiles and Amphibians			
Gopher Tortoise	*Gopherus polyphemus*	Yes	Effect
Eastern Indigo Snake	*Drymarchon corais couperi*	Yes	Effect
Florida Pine Snake	*Pituophis melanoleucus mugitus*	Yes	Effect
Florida Gopher Frog	*Rana aerolata*	Yes	Effect
Flatwoods Salamander	*Ambystoma cingulatum*	Yes	No effect
Plants			
Southern Milkweed	*Asclepias viridula*	Yes	TBD
Curtiss' Sandgrass	*Calamovilfa curtissii*	Yes	TBD
Hartwrightia	*Hartwrightia floridana*	Yes	TBD
Lake-side Sunflower	*Helianthus carnosus*	Yes	TBD
Florida Milkweed	*Matelea floridana*	Yes	TBD
Chapman's Rhododen	*Rhododentdron chapmanii*	Yes	TBD

Key at end of table.

Table D-2

SUMMARY OF RESULTS AND IMPACTS TO FEDERALLY LISTED THREATENED, ENDANGERED, AND SPECIES OF CONCERN THAT OCCUR OR POTENTIALLY OCCUR AT NAS CECIL FIELD

Species		Presence of Suitable Habitat	Potential Impacts
Common Name	Scientific Name		
St. John's Susan	*Rudbeckia nitida*	Yes	TBD
Green Ladies-Tresses	*Spiranthes polyantha*	Yes	TBD
Variable-Leaf Crownbeard	*Verbesina heterophylla*	Yes	TBD

Key:

TBD = To be determined.

Source: Bentzien 1995.

commercial development, significantly low floor area ratio (FAR) controls would be adopted to control the density of new development (e.g., 0.15 for industrial uses and 0.30 for commercial uses).

Review and regulations of subsequent development projects following disposal would be primarily under the auspices of the city of Jacksonville and the state of Florida, unless a project involved a federal action, such as the issuance of federal permits, in which case appropriate federal agencies would also have review authority (e.g., U.S. Army Corps of Engineers, USFWS, etc.). The FGFWFC will ensure that future redevelopment activities fulfill all permit requirements regarding both state and federally listed species of concern likely to occur in the area.

Because the redevelopment of the station would occur over a 25- to 30-year period and involve a number of different actions and entities, potential impacts in this biological assessment are described in terms of qualitative changes to suitable habitat (i.e., loss of habitat, creation of open areas, etc.) and/or species populations. The occurrence of federally listed species and/or suitable habitat at NAS Cecil Field is based on the information presented in Section 4 of this biological assessment (CZR, Inc. 1994; ESP 1990; Palis 1995a; E & E/ SOUTHDIV 1995).

5.1 Mammals

The proposed action would have no effect on the Florida black bear, Florida mouse, or southeastern big-eared bat. NAS Cecil Field does not provide suitable habitat for these species of concern; therefore, they are unlikely to occur at the station.

Three individual Sherman's fox squirrels were observed during the field survey, and suitable habitat was identified at NAS Cecil Field. This squirrel is closely associated with areas that contain both pine and oak habitats. Consequently, reuse activities that require clearing or modifying these areas would result in a minor negative effect to the Sherman's fox squirrel; it is unlikely that individual squirrels would be adversely effected, but a loss of habitat would result. Any activities planned in the areas of suitable squirrel habitat should be scheduled to avoid the breeding season when the less mobile young are present.

5.2 Birds

The proposed action would have no effect on the red-cockaded woodpecker, bald eagle, or Florida scrub jay. NAS Cecil Field does not provide suitable habitat for these species of concern and they are unlikely to occur at the station.

No individual wood storks were observed during the field survey, but suitable foraging habitat was identified at NAS Cecil Field. Wood storks have been reported to feed in several of the wetland areas at the station. Because these wetlands are federally protected and are considered difficult areas to develop, it is likely that they would be avoided during the redevelopment of the station. Consequently, the proposed action would have no effect on the wood stork because their breeding activities would not be adversely impacted and the wetland areas would be avoided.

No individual southeastern American kestrels were observed during the field survey, but suitable habitat was identified at NAS Cecil Field. This kestrel prefers open areas with short vegetation and scattered perches for foraging, and trees with existing cavities for nesting. Consequently, reuse activities that require developing open areas and/or removing cavity trees would result in a minor negative effect to the southeastern American kestrel. It is unlikely that any individual kestrels would be adversely effected, but a loss of habitat would result. However, depending on the characteristics of individual redevelopment projects at the station, additional areas of suitable kestrel foraging habitat (open areas) may be created, and result in negligible or even positive effects. In addition, two areas of suitable foraging habitat, the area surrounding the existing runways and the area along the station's golf course, would not be affected by redevelopment activities. Nevertheless, all redevelopment activities that require removing cavity trees should be conducted during the nonbreeding season to avoid impacts to the unfledged young. In addition, mitigative measures should be taken by the redevelopers, such as the erection of nest boxes, to compensate for the loss of potential nesting habitat.

Two individual Bachman's sparrows were observed during the field survey, and suitable habitat was identified at NAS Cecil Field. This sparrow is closely associated with the extensive areas of dry, open pinelands that occur throughout the facility and adjacent areas (Branan Field Mitigation Bank). Consequently, reuse activities that require clearing or modifying these areas would result in a minor negative effect to the Bachman's sparrow. It is unlikely that individuals would be adversely affected, but a loss of habitat would result. All activities planned in the areas of suitable sparrow habitat should be scheduled during the nonbreeding season to avoid impacts to the unfledged young.

5.3 Reptiles and Amphibians

Numerous gopher tortoises were observed during the field survey, and suitable habitat was identified at NAS Cecil Field. The Main Station currently supports a large population of

tortoises, and the Yellow Water Area provides habitat for a relatively smaller population (CZR, Inc. 1994). Consequently, reuse activities that require excavating, clearing, developing, and/or modifying the primarily upland communities that support gopher tortoises would result in a negative effect. Because of the high concentration of gopher tortoises at NAS Cecil Field, the degree of impact/effect (i.e., minor, moderate, or significant) will depend on the number of burrows disturbed and the extent of lost habitat. Nevertheless, because the tortoise is a less mobile species, redevelopment entities should conduct surveys immediately prior to any habitat alterations, and individual tortoises found during these surveys should be relocated to another area of suitable habitat. In addition, the area that is to be disturbed should be fenced during construction activities to prevent gopher tortoises from entering or returning to the area.

No individual eastern indigo snakes, Florida pine snakes, or Florida gopher frogs were observed during the field survey, but suitable habitat for these species was identified at NAS Cecil Field. In addition, one of the shedded snake skins found during the survey is believed to be from a Florida pine snake (Moler 1995). All three of these species are closely associated with gopher tortoise burrows and habitat. Consequently, reuse activities that require clearing, developing, or modifying suitable gopher tortoise habitat would result in a negative impact to these species. Similar to the gopher tortoise, the degree of impact/effect would depend on the occurrence of these species in the area, as well as the amount of habitat lost. Because these species are more mobile than the gopher tortoise, they are likely to vacate the area when project disturbances begin. However, if any of these species are found during subsequent gopher tortoise surveys, they should also be relocated.

No individual flatwoods salamanders were observed during the field survey, but suitable habitat was identified at NAS Cecil Field (Palis 1995a). This species is closely associated with the wetland areas of the Yellow Water Area, especially areas of wiregrass. However, because the wetland areas at the facility are federally protected and considered difficult areas to develop, areas of suitable flatwoods salamander habitat would not be impacted by the proposed reuse activities. Consequently, the proposed action would have no effect on the flatwoods salamander.

5.4 Plants

One population of the variable-leaf crownbeard was identified at NAS Cecil Field and suitable habitat for the nine other plant species of concern have been identified (ESP 1990). A determination regarding the effect of the proposed action on these species cannot be made

at this time. Based on the variety of habitats associated with these plants and the difficulty involved in identifying them in certain seasons, a species-specific plant survey would need to be conducted by the developer prior to the development of a area with potential habitat at the station. Surveys would need to be designed so that each individual federally listed plant species of concern is adequately addressed. Consequently, surveys should be scheduled when the plants are in bloom, which may require several visits to the area. The USFWS should be consulted for survey techniques. If a plant population is identified in the proposed project area, mitigative measures such as avoidance, relocation, or collection of seeds and propagation would need to be discussed with USFWS.

6 Conclusions

NAS Cecil Field provides suitable habitat for a total of 18 currently and formerly listed federal species of concern: one mammal, three bird, five reptile and amphibian, and 9 plant species. The Navy's proposed disposal of NAS Cecil Field would have no effect on any of these species of concern. However, the proposed reuse of the facility has the potential to affect the animal species associated with upland habitats at NAS Cecil Field: Sherman's fox squirrel, Bachman's sparrow, southeastern American kestrel, eastern indigo snake, gopher tortoise, Florida pine snake, and Florida gopher frog. Because the other species primarily occur in wetland areas that would be avoided during reuse activities, they would not be affected by the proposed reuse of NAS Cecil Field. The impacts to plants will need to be determined in a site-specific survey prior to redevelopment activities.

Overall, the proposed reuse and subsequent development of the station would result in a negative effect to federally listed species. Mammal and bird species of concern located in the area of proposed redevelopment activities would vacate the area prior to development: it is unlikely that individuals would be affected, but a permanent loss of habitat would result. Similarly, reptiles and amphibians located in the area of proposed reuse activities would be relocated prior to development. It is unlikely that any individuals would be affected, but a permanent loss of habitat would result. The land area required for development activities and the amount of habitat disturbed will determine the overall effect on the populations of these species of concern. Additional surveys in the areas selected for redevelopment would be required to determine the occurrence of plant species of concern; assess the quantitative effects on animal and plant species of concern that occur in the area; relocate any species of concern located in the area; and determine appropriate mitigative measures.

Mitigative measures that are incorporated into the disposal and reuse activities at NAS Cecil Field would help minimize the overall effect to species of concern. Management of the station in accordance with the natural resource management plan prepared by the USFWS, and continuation of forestry management practices will benefit the species of concern that

occur at the station. Similarly, the FGFWFC's stewardship of the property following the Navy's disposal/closure activities will ensure the protection of state- and federally listed species. Avoiding areas identified as suitable habitat as much as possible would reduce the amount of habitat loss and minimize the negative effect. Scheduling clearing and/or construction activities during the nonbreeding season of the species that may occur in the area would reduce negative effects to the species population. Installation of man-made structures such as nesting platforms, nesting boxes, and protective fences and/or boardwalks would help compensate for habitat loss and would encourage the continuation of species of concern at the facility. In addition, several species of concern would benefit from habitat management practices such as periodic burning and the reduction of understory growth. The proposed reuse of NAS Cecil Field could incorporate the continuation and/or development of suitable habitat for a number of the species of concern identified in this biological assessment.

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E

Programmatic Agreement Regarding Cultural Resources at NAS Cecil Field

FINAL

PROGRAMMATIC AGREEMENT
AMONG
DEPARTMENT OF THE NAVY,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
AND
THE FLORIDA DIVISION OF HISTORIC RESOURCES
CONCERNING
BASE CLOSURE AND REALIGNMENT
OF
NAVAL AIR STATION, CECIL FIELD,
JACKSONVILLE, FLORIDA

WHEREAS, the Department of the Navy (Navy) is responsible for the implementation of applicable portions of the Base Closure and Realignment Act of 1990 (Title XXIX of P.L. 101-510) as amended by P.L. 102-190 and P.L. 102-484, commonly known as the "BRAC" program; and

WHEREAS, the Navy is proceeding with base realignment and closure actions, to include the realignment of functions and units, closure of installations, and disposal of surplus property in a manner consistent with the *Report of the Defense Secretary's Commission on Base Realignments and Closures* and *Defense Base Closure and Realignment Commission Report to the President, 1993*; and

WHEREAS, the Navy has determined that its implementation of the BRAC program may have effects on properties at Naval Air Station (NAS) Cecil Field which are eligible for inclusion in the National Register of Historic Places (historic properties) as identified in *Cultural Resources Assessment for Base Realignment and Closure, Naval Air Station Cecil Field, Jacksonville, Florida, September 1995 (Assessment), and has consulted with the Florida State Historic Preservation Officer (SHPO), Florida Department of State, Division of Historic Resources*, and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C., Section 470f), Section 110(f) of the same Act (16 U.S.C., Section 470h.2[f]), and Section 111 of the same Act (16 U.S.C., Section 470h.3); and

WHEREAS, appropriate restrictive devices have been prepared to protect these properties in the event of lease or transfer/sale (Appendices 1 and 2); and

WHEREAS, there is an agreed upon mechanism for the amendment of this document as future circumstances may require (Appendix 3); and

WHEREAS, interested members of the public, including the National Trust for Historic Preservation and the various local governments have been invited and provided an opportunity to comment on the effects of this Base Closure and Disposal Action may have on historic properties which might exist at NAS Cecil Field; and

NOW, THEREFORE, the Navy, the SHPO, and the Council agree that the undertaking shall be implemented in accordance with the following stipulations to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The Navy will ensure that the following stipulations are implemented:

I. Architectural and Archeological Properties

A. For the purposes of this Agreement, it is understood that:

1. Based upon the investigations, identification, and evaluation processes discussed in the Assessment, no architectural properties exist at NAS Cecil Field which meet any of the eligibility criteria for inclusion in the National Register of Historic Places (NRHP).

2. Nineteen (19) areas (Appendices 4 and 5) were identified at NAS Cecil Field which the Assessment identified as areas of high potential for the existence of archeological artifacts or data which might meet NRHP criteria.

II. Areas of Potential Effect

Although some BRAC actions may induce changes in population distribution, traffic, and/or land use that extend beyond the boundaries of NAS Cecil Field properties to be closed, transferred/disposed of, and/or parcels on which new construction will occur, the effect of these changes on potential historic properties is uncertain at this time. Accordingly, during preliminary coordination with the SHPO (Stipulation III), the Navy will define the area of potential effects (APE) of a BRAC action consistent with the Council's regulations (36 CFR, Sections 800.2(c), 800.9(a), and 800.9(b)), and with reference to possible adverse effects to potential historic properties which may reasonably be expected to occur on or adjacent to the property subject to

the BRAC action. In cases of dispute over the APE of a BRAC action, the opinion of the Council will be binding on all parties to this Agreement.

III. NEPA and Preliminary Coordination with the SHPO

A. It is mutually understood that many of the terms of this Agreement will be carried out after the Navy has complied with the National Environmental Policy Act (NEPA) and filed its Record of Decision (ROD), Finding of No Significant Impact (FONSI), or Categorical Exclusion (CATEX). Nevertheless:

1. The Navy must meet all its NHPA responsibilities for BRAC generated activities; and

2. Whenever it is feasible for the Navy to carry out the terms of this Agreement prior to filing the ROD, FONSI, or CATEX, the Navy will do so; and

3. When it is infeasible to complete the actions required by Section 106 of the NHPA prior to issuance of a CATEX, FONSI (assuming a FONSI is otherwise proper given the affects on potential historic property sites), or ROD, the Navy will stipulate in the CATEX, FONSI, or ROD the specific areas in which the Navy has not complied with the NHPA. The FONSI or ROD will further specify that the Navy will not undertake any new BRAC construction, renovation, land disposal, training exercises, or other activities which could affect potential historic properties until the actions necessary to inventory, assess, and take into account the effects on historic properties, should they exist, have been completed consistent with the terms set forth in this Agreement; and

4. For the Navy, the Southern Division, Naval Facilities Engineering Command Historic Preservation Officer (HPO) or his designee will review the draft ROD or FONSI for this BRAC action to ensure that outstanding historic preservation requirements are adequately addressed in these documents; and

5. The Navy will ensure that no actions that could result in effects on existing or potential historic properties are undertaken pursuant to a ROD, FONSI, or CATEX until the terms of this Agreement have been carried out.

B. The Navy will notify the Florida SHPO within 60 days after the signing of this Agreement about the nature and timing of the BRAC actions for NAS Cecil Field, and will provide the following information:

1. A description of the type and location of the undertaking.

2. Currently available milestones for BRAC actions affecting the installation.

3. Information available about identified or potential historic properties at the installation.

4. Currently available information about the actions of the Department of Defense Office of Economic Adjustment concerning the setup of local reuse committees for NAS Cecil Field, or portions thereof, which the Navy will dispose.

C. The Navy will coordinate the NEPA process with its NHPA activities. In accordance with NEPA requirements, NEPA documentation for NAS Cecil Field will:

1. Identify known or potential historic properties and past studies;

2. Identify the potential for historic properties to be affected by the BRAC process; and

3. Identify the steps necessary for the Navy to meet its Section 106 responsibilities under NHPA.

D. The level of documentation in Stipulation III, C, 1-3, above will be commensurate with the type of environmental document prepared. Only brief overviews and summaries of impacts, if any, are expected in a CATEX and Environmental Planning Guide (EPG). When an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared, a more detailed presentation of data will be included.

E. The Navy will send the Florida SHPO any BRAC EA or Draft EIS (DEIS) for their review and comment. There will be a 30-day review period from the date received during the public comment period. The review time for an EA, however, will be 15 working days from date of receipt, due to an accelerated schedule for EAs. The information included in these documents will constitute the first effort in the process to identify historic properties and assess the potential effects on them as defined in 36 CFR Parts 800.4 and 800.5.

F. The Navy will ensure that copies of the Final BRAC EA or EIS are provided to the Florida SHPO.

G. The Navy shall provide a copy of this Agreement, its attachments and appendices, and the materials listed in Stipulation IX of this Agreement, to appropriate Commanders, Commanding Officers, Major Claimants, and other elements of the Navy responsible for Navy BRAC NEPA compliance.

H. On January 1, 1997, and on that same date every year thereafter, until all NAS Cecil Field properties have been transferred or otherwise disposed of, the Navy will provide the

Florida SHPO with an annual update report on the status of BRAC activities. The report shall discuss all BRAC historic resource investigations and coordination undertaken and document all no effect or no adverse effect determinations received for BRAC-related projects. The report will also include a discussion of activities undertaken for closing facilities by the Department of the Navy. This report will be prepared until such time as all necessary NHPA requirements for BRAC have been met or a decision has been made by the Navy not to proceed with further BRAC actions.

IV. IDENTIFICATION AND EVALUATION

A. Identification and Evaluation Process

1. In accordance with the requirements of Section 110 of 36 CFR Part 800, the Navy has conducted the Assessment which addressed all efforts made for the identification and evaluation of historic properties located within the boundaries of NAS Cecil Field. This Assessment in its preliminary form was submitted to the Florida SHPO for review and comment, and was made available to interested parties of the general public. All comments received were taken into account, and proposed changes considered valid were incorporated into the final document.

2. During the conduct of the investigation, no architectural properties were discovered which met the criteria for inclusion in the National Register of Historic Places (NRHP), and as a result, it was the determination of the Navy that no architectural historic properties existed. The Florida SHPO concurred in this determination.

3. Inasmuch as the land holdings of NAS Cecil Field consists of several thousand acres of forested and undeveloped land, the Assessment focused on archival research, topographical walk-overs, and the development of a computer model which would identify areas of high potential for archeological sites (See Appendices 4 and 5). Nineteen (19) high potential areas were identified. Four of these areas (one in proximity to Yellow Water Housing Area [Appendix 4], and three located within the boundaries of the Whitehouse Outlying Landing Field [OLF] [Appendix 5]) are being transferred to NAS Jacksonville effective October 1, 1996, and will shortly thereafter be the subject of intensive surveys and testing to determine whether or not archeological deposits exist, and if so, whether or not those deposits are eligible for the NRHP. As NAS Jacksonville property, these four areas will continue to receive the protection of the NHPA. The remaining fifteen (15) areas exist in forested areas which will be disposed of to non-federal entities. Protective covenants and standards have been developed (See Appendices 1 and 2) to provide interim- and long-range protection for these fifteen (15) potential areas. Until such time as these fifteen (15) areas are disposed of, the Navy will continue to comply with the Section 106, NHPA, requirements on all undertakings which are proposed within or in proximity to the identified sites.

4. The Navy will ensure the identification of significant records and objects related to the historic past of NAS Cecil Field, and these records and/or objects will be archived at a repository specified by the Secretary of the Navy, in accordance with the requirements of the NHPA.

5. Throughout the planning and implementation of the BRAC program at NAS Cecil Field, the Navy will provide guidance to the activity to ensure that historic properties, if any, are not inadvertently damaged, destroyed, or allowed to deteriorate before, during, or after closure or realignment.

V. DETERMINATION OF EFFECT

A. The Navy, in consultation with the Florida SHPO, shall determine the effect of BRAC actions on existing or potential historic properties in accordance with 36 CFR 800.5, applying the Criteria of Effect and Adverse Effect at 36 CFR 800.9.

B. Where the Navy determines pursuant to 36 CFR 800.5 and 36 CFR 800.9 that an adverse effect may occur, then:

1. If the Navy determines, in consultation with the SHPO and taking into account the comments, if any, of the interested person(s) identified at 36 CFR 800.5(e)(1), that it is appropriate to apply the standard mitigation measures set forth in Appendix X, the Navy will provide the SHPO with sufficient documentation to support this determination, advise him that the Navy intends to carry out the specific measures, and request his concurrence within 30 days. If the SHPO concurs within 30 days of their receipt of such documentation, the Navy shall carry out the standard mitigation measures it has determined to be appropriate. Failure by the SHPO to respond within the specified time period shall be conclusive of the SHPO's concurrence. Should the SHPO disagree with the Navy's determination, the Navy will initiate consultation in accordance with 36 CFR 800.5(e).

2. If the Navy and the SHPO, taking into account the comments, if any, of the interested person(s) identified at 36 CFR 800.5(e)(1), agree on a program to avoid, minimize, or mitigate the adverse effect, the Navy will provide the Council with sufficient documentation to support this determination and request its concurrence within 30 days of receipt. If the council concurs within this specified period, the Navy shall carry out the program. Failure by the Council to respond within the specified time period shall be conclusive of the Council's concurrence. Should the Council object to the program, the Navy will undertake consultation in accordance with 36 CFR 800.5(e).

VI. TREATMENT AND MANAGEMENT

A. The Navy will ensure that the effects of BRAC actions on historic properties, if such exist, are treated in accordance with the determinations and agreements reached pursuant to Stipulation V.

B. For those portions of NAS Cecil Field which are being transferred to NAS Jacksonville, and therefore retained by the Navy, the Navy will ensure that they continue to receive the protection guaranteed by the NHPA, and this protection will be managed by the Commanding Officer, NAS Jacksonville, or his designee, and these properties will be included in the preservation actions and plans established by and carried out by NAS Jacksonville.

C. Inasmuch as the potential archeological sites to be retained by NAS Cecil Field after 1 October 1996, and identified by the Assessment are generally located in forestry managed areas of NAS Cecil Field, it is agreed that normal forest management procedures may continue without consultation when the required actions are not within or in immediate proximity to the identified areas of high potential for archeological deposits. When the planned projects are within or in immediate proximity to the identified areas of high potential, the Navy will enter into case-by-case consultation with the Florida SHPO as required by Section 106 of the NHPA.

D. The Navy will ensure that the provisions of the Archaeological Resources Protection Act (P.L. 96-95) and the Native American Graves Protection and Repatriation Act (P.L. 101-601) are implemented, as appropriate, during the BRAC process.

VII. INTERIM PROTECTION, RECORDS RETENTION, AND LONG-TERM CURATION

A. The Navy will ensure interim protection of identified and potential historic properties to ensure that deferred maintenance and other management decisions do not adversely affect the integrity of these properties.

B. The Navy will consult with the SHPO on terms of curation and disposition of historical documents, drawings, photographs, reports, and archeological materials generated by BRAC studies.

VIII. PUBLIC INVOLVEMENT

A. For those portions of NAS Cecil Field which the Navy will dispose, the Navy has notified the Department of Defense Office of Economic Adjustment, and will notify the local

reuse committee(s) about NHPA requirements and concerns. To the fullest extent possible and appropriate, the Navy will work with the local reuse committee(s), the Florida SHPO, and other interested parties to develop treatments and/or management plans to ensure compatible reuses.

B. The Navy and the Florida SHPO will consider the need for additional consulting parties consistent with the Council's publication *Public Participation in Section 106 Review: A Guide for Agency Officials (Advisory Council on Historic Preservation, 1989)*.

C. To the extent practicable, public participation shall be coordinated with public participation under NEPA.

IX. STANDARDS AND GUIDELINES

Standards and guidelines for implementing this Agreement include, but are not limited to:

Chief of Naval Operations (OPNAV) Instruction 5090.1B, Chapter 23;

Secretary of the Navy (SECNAV) Instruction 4000.35;

36 CFR Part 800: Protection of Historic Properties;

The Section 110 Guidelines: Guidelines for Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act (53 FR 4727-4746);

The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1990);
Identification of Historic Properties: A Decision Making Guide for Managers (Advisory Council on Historic Preservation, 1989);

Preparing Agreement Documents (Advisory Council on Historic Preservation, 1989); and

Guidelines for Evaluating and Documenting Traditional Cultural Properties (National Register Bulletin 38, 1991).

X. DISPUTE RESOLUTION

A. Should the Florida SHPO or an interested party identified at 36 CFR 800.5(e)(1) object to the Navy's implementation of any part of this Agreement, the Navy shall consult with

the objecting party to resolve the objection. If the Navy determines that the objection cannot be resolved, the Navy shall forward all documentation relevant to the dispute to the Council. Within 30 days of receipt of all pertinent documentation, the Council will either:

1. Provide the Navy with recommendations, which the Navy will take into account in reaching a final decision regarding the dispute; or

2. Notify the Navy that it will comment pursuant to 36 CFR 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the Navy in accordance with 36 CFR 800.6(c)(2) with reference to the subject of dispute.

B. Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; the Navy's responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

C. Should a member of the public object to any measure carried out under the terms of this Agreement, or the manner in which such a measure is implemented, the Navy shall take the objection into account and consult as needed with the objecting party, the SHPO, and the Council to resolve the objection.

XI. AMENDMENTS

Any signatory to this Agreement who determines that some portion of the Agreement cannot be met must immediately request the other signatories to consider an amendment or addendum to this Agreement which would ensure full compliance. Such an amendment or addendum shall be executed in the same manner as the original Agreement using the format provided in Appendix 3. Should any signatory to this Agreement be unable to maintain a level of effort sufficient to carry out the terms of the Agreement, that signatory shall notify the others and seek an appropriate amendment.

XII. ANTI-DEFICIENCY ACT

A. All requirements set forth in this Agreement requiring the expenditure of Navy funds are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act (31 U.S.C. Section 1341). No obligation undertaken by the Navy under the terms of this Agreement shall require, or be interpreted to require, a commitment to expend funds not appropriated for a particular purpose.

B. If the Navy cannot perform any obligation set forth in this Agreement due to the unavailability of funds, the Navy, the SHPO, and the Council intend the remainder of the Agreement to be executed. Any obligation under the Agreement which cannot be performed due to the unavailability of funds must be renegotiated between the Navy, the SHPO, and the Council.

XIII. TERMINATION OF AGREEMENT

This Agreement will terminate upon official notification to the SHPO and the Council that all NAS Cecil Field property has been transferred or disposed of by the Navy, and that the Navy no longer holds any property interest in the property now known and defined as the Naval Air Station Cecil Field, Jacksonville, Florida.

Execution and implementation of this Programmatic Agreement establishes that the Navy has satisfied its responsibilities under Sections 106 and 110(f) of the National Historic Preservation Act of 1966, as amended, for all individual undertakings of the BRAC program as outlined in this Agreement.

DEPARTMENT OF THE NAVY

By: Frank T. Bossio Date: 9-30-96
Frank T. Bossio, CAPT, USN
Commanding Officer, NAS Cecil Field, Florida

FLORIDA STATE HISTORIC PRESERVATION OFFICER

By: George W. Percy Date: 10/9/96
George W. Percy, Division of Historic Resources

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: John M. Fowler Date: 1/22/97
for Robert D. Bush, Executive Director

APPENDIX 1

PRESERVATION COVENANT FOR ARCHEOLOGICAL SITE

In consideration of the conveyance of the real property that includes the (*name of archeological site*) located in Duval and Clay Counties, State of Florida, which is more fully described as: *(Insert legal description)*. Grantee hereby covenants on behalf of himself/herself/itself, his/her/its heirs, successors and assigns at all times to the United States Department of the Navy (Navy) and the Florida State Historic Preservation Officer (SHPO) to maintain and preserve the (*name of archeological site*) as follows:

1. No disturbance of the ground surface or any other thing shall be undertaken or permitted to be undertaken on (*name of archeological site*) which would affect the physical integrity of the archeological site without the express prior written permission of the Florida SHPO, signed by a fully authorized representative thereof. Should the Florida SHPO require, as a condition of the granting of such permission, that the Grantee conduct archeological data recovery operations or other activities designed to mitigate the adverse effect of the proposed activity on the (*name of archeological site*), the Grantee shall at his/her/its own expense conduct such activities in accordance with the Secretary of the Interior's Standards and Guidelines for Archeological Documentation (48 FR 447344-37) and such standards and guidelines as the Florida SHPO may specify, including, but not limited to, standards and guidelines for research design, field work, analysis, preparation and dissemination of reports, disposition of artifacts and other materials, consultation with Native American or other organizations, and re-interment of human remains.

2. Grantee shall make every reasonable effort to prohibit any person from vandalizing or otherwise disturbing the (*name of archeological site*) and shall promptly report any such disturbance to the Florida SHPO.

3. The Florida SHPO shall be permitted at all reasonable times to inspect (*name of archeological site*) in order to ascertain if the above conditions are being observed.

4. In the event of a violation of this covenant, and in addition to any remedy now or hereafter provided by law, the Florida SHPO may, following reasonable notice to the Grantee, institute a suit to enjoin said violation or to require the restoration of (*name of archeological site*). The successful party shall be entitled to recover all costs or expenses incurred in connection with such suit, including all court costs and attorney's fees.

5. Grantee agrees that the Florida SHPO may at his/her/its discretion, without prior notice to Grantee, convey and assign all or part of its rights and responsibilities contained herein to a third party.

6. This covenant is binding on Grantee, his/her/its heirs, successors and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by Grantee verbatim or by express reference in any deed or other legal instrument by which he/she/it divests himself/herself/itself of either the fee simple title or any other lesser estate in (*name of archeological site*) or any part thereof.

7. The failure of the Florida SHPO to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

This covenant shall be binding servitude upon the real property that includes (*name of archeological site*) and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence the Grantee agrees to be bound by the foregoing conditions and restrictions and to perform to obligations herein set forth.

APPENDIX 2

ARCHEOLOGICAL DATA RECOVERY PROJECT STANDARDS

Archeological data recovery shall be carried out in accordance with a data recovery plan developed in consultation with the Florida State Historic Preservation Officer (SHPO). The data recovery plan shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeological Documentation* (48 FR 447344-37) and pertinent standards and guidelines of the Florida SHPO, and shall take into account the Advisory Council on Historic Preservation's (Council) publication, *Treatment of Archeological Properties* (Advisory Council on Historic Preservation, [draft] 1980), subject to any pertinent revisions the Council may make in the publication prior to completion of the data recovery plan. The plan shall, at a minimum, specify:

1. The property, properties, or portions of properties where data recovery is to be carried out;

2. Any property, properties, or portions of properties that will be transferred without data recovery, and the rationale for doing so;

3. The research questions to be addressed through the data recovery, with an explanation of their relevance and importance;

4. The field work methodology to be used, with an explanation of its relevance to the research questions;

5. The methodology to be used in analysis, with an explanation of its relevance to the research questions;

6. The methodology to be used in data management and dissemination of data, including a schedule;

7. The manner in which recovered materials will be disposed of, in a manner consistent with State of Florida law regarding disposition of archeological materials and recovered human remains;

8. The manner in which field notes and other records of field work and analysis will be preserved and disposed of;

9. The methodology to be used to involve the interested public in the data recovery process;

10. The methodology to be used in disseminating results of the work to the interested public;

11. The methodology by which parties with special interests in the property, if any, will be kept informed of the work and afforded the opportunity to participate; and,

12. The schedule for the submission of progress reports and final reports to the Florida SHPO and others.

Records of data recovery field work and analysis shall be retained in an archive or other curatorial facility approved by the Florida SHPO and disseminated as appropriate to facilitate research and management without unduly endangering historic properties. Material recovered from data recovery projects shall be curated in accordance with 36 CFR Part 79, except that human remains and artifacts associated with graves shall be treated in conformance with requirements of the *Native American Graves Protection and Repatriation Act* (Public Law 101-601).

APPENDIX 3

AMENDMENT FORM

Amendment # ____

Date: _____

PROGRAMMATIC AGREEMENT

AMONG:
THE DEPARTMENT OF THE NAVY,
FLORIDA STATE HISTORIC PRESERVATION OFFICER,
AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

FOR THE:
BASE CLOSURE AND DISPOSAL OF
THE NAVAL AIR STATION, CECIL FIELD
JACKSONVILLE, FLORIDA

1. Need for Amendment: (Describe briefly)

2. Proposed Amendment Narrative: (Specify)

DEPARTMENT OF THE NAVY:

By:_____ Date: _____
(Typed Name, Rank, Title and Command)

FLORIDA STATE HISTORIC PRESERVATION OFFICER:

By:_____ Date: _____
(Typed Name and Title)

ADVISORY COUNCIL ON HISTORIC PRESERVATION:

By:_____ Date: _____
(Typed Name and Title)

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

JAN 27 1997

Mr. R. N. Johnson
Historic Preservation Officer
Southern Division
Naval Facilities Engineering Command
P. O. Box 190010
2155 Eagle Drive
North Charleston, SC 29419-9010

REF: Closure of Naval Air Station Cecil Field
Jacksonville, Florida

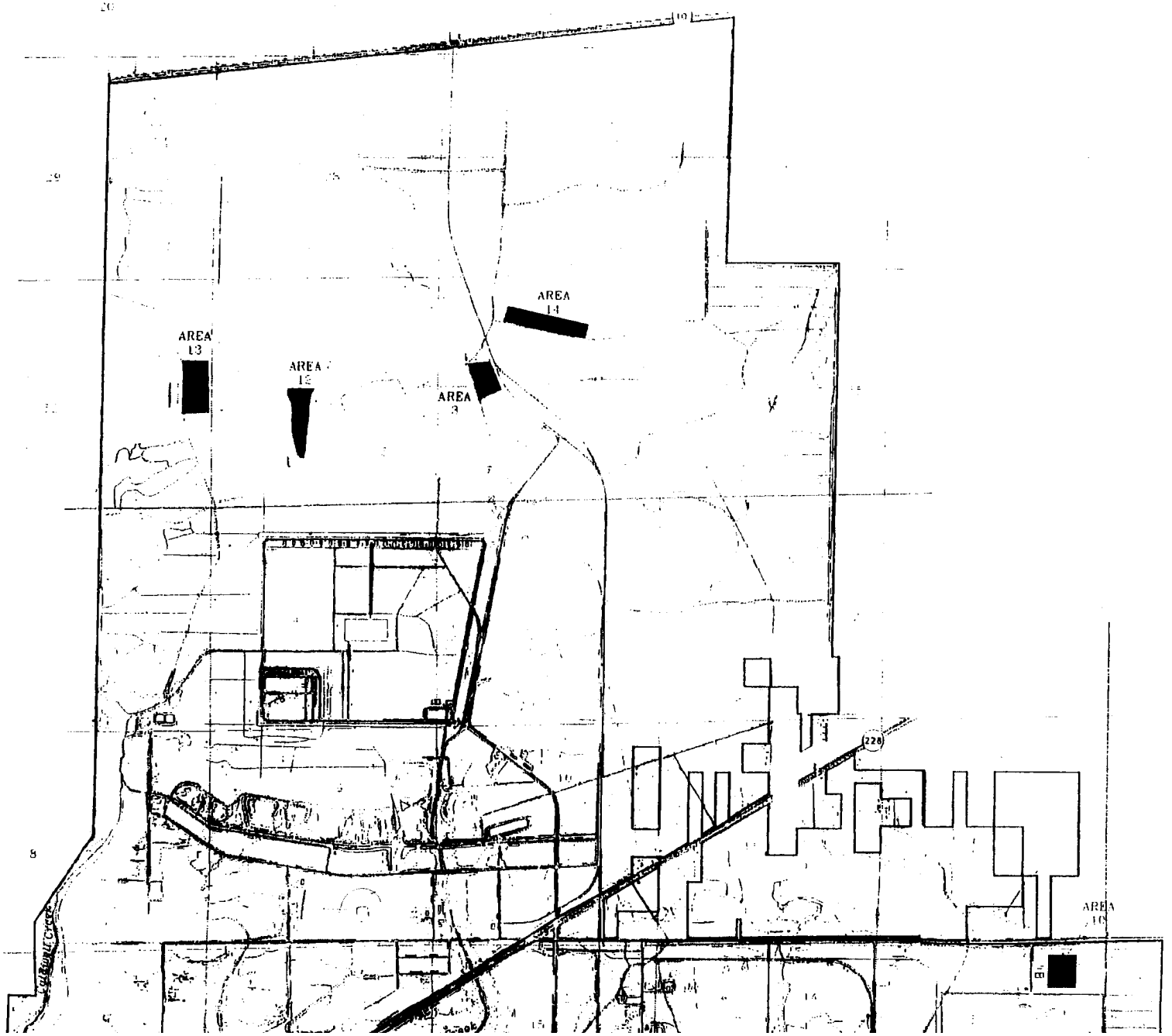
Dear Mr. Johnson:

The enclosed Programmatic Agreement for the referenced undertaking has been signed by the Council. This completes the requirements of Section 106 of the National Historic Preservation Act and the Council's regulations. We recommend that you provide a copy of the fully-executed Agreement to the Florida State Historic Preservation Officer.

Sincerely,

Drusilla J. Null

for Don L. Klima
Director
Office of Planning and Review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APP

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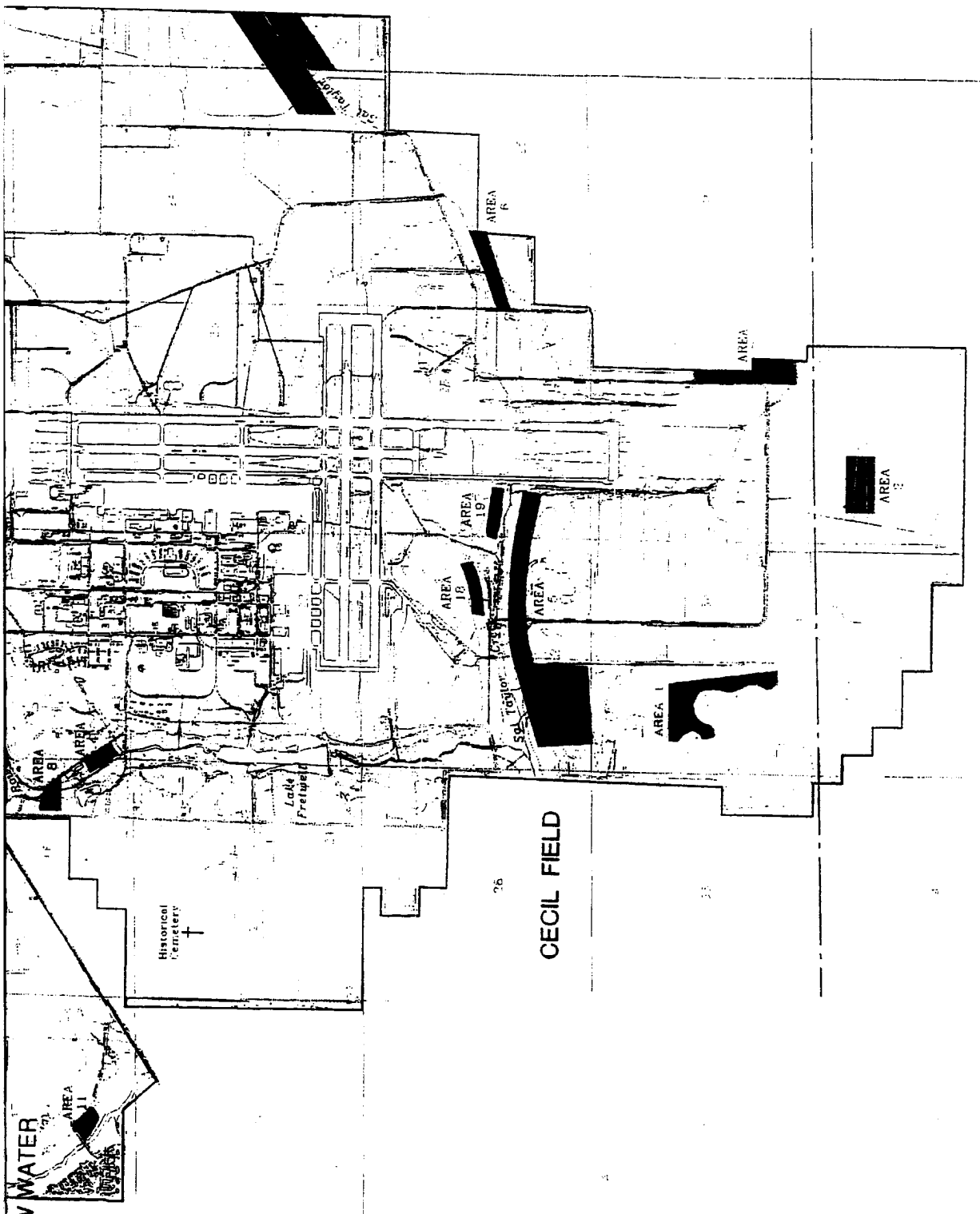
ARCHEOLOGICAL

APPENDIX 4



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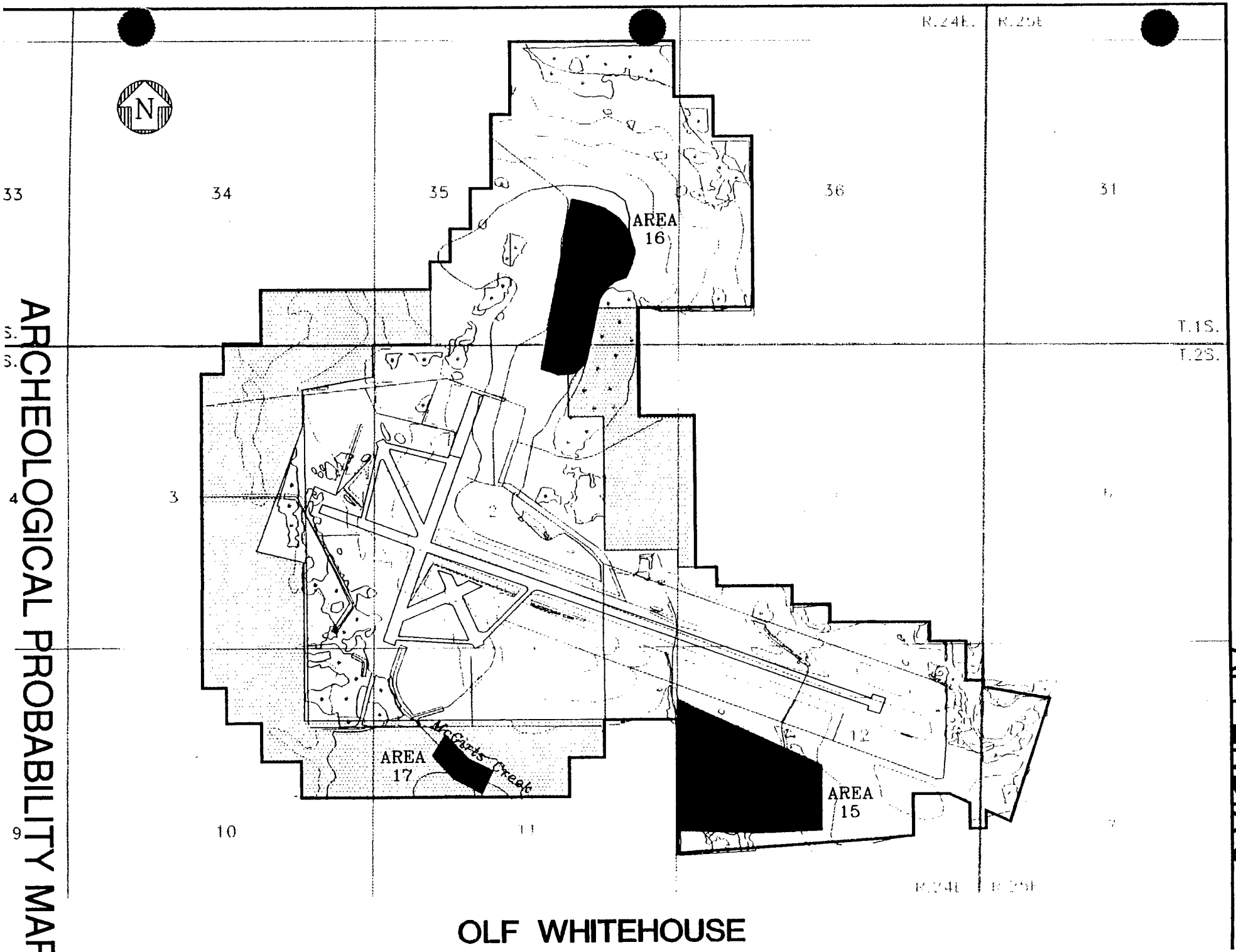
ARCHEOLOGICAL PROBABILITY MAP



ARCHEOLOGICAL PROBABILITY MAP

APPENDIX 5

OLF WHITEHOUSE