

TECHNICAL BACKGROUND DOCUMENT

Environmental Evaluation of Existing and Proposed Mining Operations VOLUME I

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LIST OF ABBREVIATIONS

| | |
|--------|---|
| ACOE | U.S. Army Corps of Engineers |
| APHA | American Public Health Association |
| BOD | Biochemical Oxygen Demand |
| CFR | Code of Federal Regulations |
| CR | County Road |
| DRI | Development of Regional Impact |
| EIS | Environmental Impact Statement |
| EPA | U.S. Environmental Protection Agency |
| ET | Evapotranspiration |
| FAC | Florida Administrative Code |
| FCREPA | Florida Committee on Rare and Endangered Plants and Animals |
| FDAHRM | Florida Division of Archives, History, and Records Management |
| FDER | Florida Department of Environmental Regulation |
| FDNR | Florida Department of Natural Resources |
| FDOT | Florida Department of Transportation |
| FGFWFC | Florida Game and Fresh Water Fish Commission |
| FPC | Florida Power Corporation |
| FS | Florida Statutes |
| FWS | U.S. Fish and Wildlife Service |
| GPP | Gross Primary Productivity |
| HES | Habitat Evaluation System |
| HQI | Habitat Quality Index |
| HRS | Department of Health and Rehabilitative Services |
| HSPF | Hydrological Simulation Program - Fortran (hydrological model) |
| ICRP | International Commission on Radiation Protection |
| MSHA | Mine Safety and Health Administration |
| NCFRPC | North Central Florida Regional Planning Council |
| NCRPM | National Council on Radiation Protection and Measurements |
| NFWL | National Fish and Wildlife Laboratory |
| NGVD | National Geodetic Vertical Datum |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NPP | Net Primary Productivity |
| OXY | Occidental Chemical Agricultural Products, Inc. |
| PELA | P.E. Lamoreaux and Associates, Inc. |
| PERLND | In HSPF, the module that simulates the water quality and quantity processes which occur on a pervious land segment. |
| PL | Public Law |
| RFHRES | ReaCH-REServoir (section of HSPF) |
| SA | Settling Area |
| SAD | South Atlantic Division (Corps of Engineers) |
| SCM | Swift Creek Mine |
| SCS | Soil Conservation Service |
| SR | State Road |
| SRM | Suwannee River Mine |
| SRWMD | Suwannee River Water Management District |
| UF | University of Florida |
| USDA | U.S. Department of Agriculture |
| USFS | U.S. Forestry Service |
| USGS | U.S. Geological Survey |
| WEP | Wetlands Evaluation Procedure (Reppert et al. 1979) |

GLOSSARY

Aboriginal - Of or pertaining to one of the original or earliest known inhabitants of a region.

Acute toxicity - The presence of one or more substances or characteristics or components of substances in amounts which: (a) are greater than one-third of the amount lethal to 50% of the test organisms in 96 hours (96 hr LC₅₀) where the 96 hr LC₅₀ is the lowest value which has been determined for a species significant to the indigenous aquatic community; or (b) may reasonably be expected, based upon evaluation by generally accepted scientific methods, to produce effects equal to those of the concentration of the substance specified in (a) above (Chapter 17-3.024, Florida Administrative Code).

Allochthonous materials - Energy sources used in production which originate from outside the aquatic system (e.g., leaves, fruit, and branches of terrestrial vegetation).

Alluvial deposits - Sediment deposited by flowing water (streams).

Alpha radiation - Emission from an atomic nucleus during one type of radioactive decay. The energy from alpha radiation dissipates rapidly and only penetrates 3-5 cm of air.

Anadromous - Fish that migrate from the sea up a freshwater river to spawn.

Apatite - Minerals consisting mainly of calcium phosphate, and usually containing fluorine, chlorine, or hydroxyl or carbonate ions; commonly occurs in sedimentary or igneous rocks.

Arboreal - Living in or among trees.

Autochthonous materials - Energy sources used in production and which are produced within the aquatic system (e.g., periphyton, phytoplankton, and macrophytes).

Autotrophic - Aquatic ecosystems where most of the energy sources are produced from within the system [i.e., the ratio between gross primary production and ecosystem respiration is greater than one ($P/R > 1$)].

Auxospore - The formation of spores, generally by syngamy or autogamy, by particularly small cells of a species.

Average Regional Seismic Hazard Index - A scale using historical earthquake data used to predict the Modified Mercalli intensity of the hundred-year earthquake for a region.

- Avifauna - Birds.
- Backfill - Material excavated from a site and used for refilling the area.
- Bayhead - A wetland whose primary vegetative component is various species of bay trees.
- Beneficiation - Processing phosphate ore to remove unwanted constituents.
- Benthic community - The community of organisms, often macroinvertebrates, existing on and within the substrates of aquatic systems.
- Beta radiation - Emission from an atomic nucleus during one type of radioactive decay. Beta particles are high speed electrons which dissipate energies quickly and are moderately penetrative.
- Biochemical Oxygen Demand (BOD₅) - A measure of the oxygen consumed by biochemical processes during a five-day period. It is generally an indicator of organic waste, and high levels may result in dissolved oxygen depletion.
- Biological integrity - The Shannon-Weaver diversity index of benthic macroinvertebrates retained by a U.S. Standard No. 30 sieve, composited from a minimum of three Hester-Dendy type artificial substrate samplers of 0.10 to 0.15 m² area each, incubated for a period of four weeks [Chapter 17-3.121(7), FAC].
- Biomass - The total weight or volume of all the organisms, both plant and animal, or of specific organisms in a given area.
- Ceramic artifact - A ceramic object made by aboriginal man.
- Coefficient of Variation (CV) - A method for comparing variation in populations having different means: $CV = \frac{\text{Standard deviation}}{\text{mean}} \times 100$
- Comprehensive edge index - A formula used to calculate the edge-to-area ratio.
- Contiguous - Pertaining to wetland systems that are connected (as opposed to isolated).
- Crown - The overstory in a forest.
- Cypress dome - A wetland, often circular, with cypress as the dominant vegetation.
- Desiccate - To become completely dry.

Development of Regional Impact (DRI) - Studies required by regional planning councils enabling them to evaluate the impact of large development projects on the socioeconomics and environmental characteristics of an area.

Diagenesis - Recombination or rearrangement of constituents resulting in a new product.

Diameter at breast height (dbh) - The diameter of a tree at breast height of the individual taking the measurement, approximately 4.5 ft.

Distribution Coefficient - A method for determining radiological contamination of off-site surface water during the mining of phosphate rock (formula on page 3-558).

Dosimeter - Device for measuring the number of roentgens (radiation unit) absorbed in a single exposure to radiation.

Double mass analysis - A method of comparing cumulative hydrological time series data between two systems to compare their hydrological characteristics.

Drainage pattern - The configuration, in plan view, of the stream courses in any given area.

Drift - Downstream transport of aquatic organisms and organic matter in stream currents.

Edge drama - Structural differences along the edge of adjoining plant communities.

Emanating power - The ability of radon to move from a mineral or media into the void space of soil; usually expressed as a percent.

Endangered species - Any species of fish and wildlife naturally occurring in an area whose prospect of survival is in jeopardy due to modification or loss of habitat; over-utilization for commercial, sporting, scientific, or educational purposes; disease; predation; inadequacy of regulatory mechanisms; or other natural or man-made factors affecting its continued existence.

Endemic - Species that occur only in particular areas or regions.

Epilimnion - The uppermost region of warm homothermal water in thermally-stratified lakes.

Equitability - An index used to compare the observed distribution of a species to a maximum number of taxa, based on the distribution obtained from MacArthur's broken stick model.

Ericaceous - Belonging to the Ericaceae or heath family of plants, which include azalea, rhododendron, laurel, etc.

Evapotranspiration - The total amount of water loss to the atmosphere as a result of evaporation of water from land surfaces and transpiration through the stomata of leaves.

Facultative - Organisms having a wide range of tolerance; frequently associated with moderate levels of organic contamination.

Florida index - A biotic index used to evaluate the ecological health of aquatic systems based on the presence of macroinvertebrates that have been categorized according to their tolerance to organic contamination.

Forb - Any herb that is not a grass or grass-like.

Fossiliferous - Rocks or strata bearing or containing fossils.

Freeboard - The distance between the surface of the water and the top of the retaining structure.

Fugitive particulate matter - Air pollutant emissions generated during phosphate mining.

Gamma log - The radioactivity log curve of the intensity of undifferentiated gamma radiation emitted from the rocks in a cased or uncased borehole.

Gamma radiation - Electromagnetic radiation from an atomic nucleus with accompanying emission of alpha and beta particles.

Gypsum - Hydrate calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), often a by-product of phosphate production.

Habitat Evaluation System - A classification system for estimating the quality of various habitats developed by the U.S. Army Corps of Engineers.

Habitat Quality Index - A rating factor that takes into consideration biotic and abiotic characteristics of a habitat.

Half-life - The period required for a radionuclide to lose half its activity. Each radionuclide has a characteristic half-life.

Hamlet - Archaeological term referring to dispersed habitat sites representing discrete social groups.

Hammock - An elevated well-drained tract of land rising above the general level of a marshy region.

Hawthorn Formation - A geological formation of the Miocene Series, prevalent on the OXY site; composed primarily of phosphatic clayey sands and gray to green phosphatic clays in its upper portions with sand phosphatic dolomite and limestone below.

Herpetofauna - Reptiles and amphibians.

Hester-Dendy Artificial Substrate - An artificial structure for sampling macroinvertebrates and composed of concentric layers of hard particle board held together by a bolt. Surface area = 0.13 m².

Heterotrophic - Aquatic ecosystems where most of the energy sources are produced outside the system, i.e., the ratio between gross primary productivity and ecosystem respiration is less than one (P/R <1).

Horizon - A plane in rock strata representing the deposits of a particular period and characterized by special features such as the occurrence of distinctive fossils.

Hydrograph - A plot of water elevation or discharge in a waterbody versus time.

Hydroperiod - Hydrological characteristics of an area, stream, or wetland over a given period of time, often annually.

Importance - Relative density + relative frequency + relative dominance.

Intolerant - Organisms that are not found associated with even moderate levels of organic contaminants and which are generally intolerant of even moderate reductions in dissolved oxygen.

Lacustrine - Wetlands and deepwater habitats with all of the following characteristics: 1) situated in a topographic depression or a dammed river channel; 2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30% areal coverage; and 3) total area exceeds 8 ha (20 acres). Lacustrine waters may be tidal or non-tidal, but ocean-derived salinity is always less than 0.5 ‰.

Lentic - Standing water such as a lake, marsh, or swamp.

Lithic artifacts - A rock object made by aboriginal man.

Lithology - Science dealing with the mineral composition and structure of rocks.

Littoral zone - That portion of a body of water extending from the shoreline lakeward to the limit of occupancy by rooted plants.

Macroinvertebrate - Aquatic invertebrates retained by a U.S. Standard No. 30 sieve.

Macrophyte - The larger aquatic plants of all types that may be attached to the substrate, free-floating, or totally or partially submerged.

Matrix - Mineral formation containing phosphate ore.

Megafauna - Large animals.

Mesic - Adapted to an environment having a balanced supply of moisture.

Metabolite - A product of metabolic action.

- Micronutrient** - Nutrient required by vegetation in very small quantities.
- Microroentgen** - One microroentgen is equivalent to 1×10^{-6} roentgens. A roentgen is a unit of measurement of ionizing radiation (e.g., x-rays, gamma rays) equal to the quantity of radiation that will produce, in 0.001293 g of dry air (at 0°C and 760 mm Hg), ions carrying one electrostatic unit of electricity of either sign.
- Millirems** - One millirem is equivalent to 0.001 rem. A rem (short for roentgen equivalent man) is a measure of radiation intended to take into consideration the biological effects of different kinds of radiation.
- Mitigate** - To lessen environmental damage by various means or to replace a damaged habitat, generally on a 1:1 basis.
- Modified Mercalli Intensity Scale** - A scale for measuring the intensity of ground movements during earthquakes.
- Net Primary Productivity** - The rate of storage of organic matter in plant tissue in excess of the respiratory utilization by the plant.
- Outstanding Florida Water** - A designation of unique and special waterbodies that provides for additional protection under the laws of the State of Florida (Chapter 17-4.242, FAC).
- Overburden** - The soils overlying the phosphate ore matrix.
- Oxidation** - The union of a substance with oxygen. In chemical reactions, oxidation is the process of increasing the positive valence or decreasing the negative valence of an element or ion.
- Palustrine** - All nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ‰. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: 1) area less than 8 ha (20 acres); 2) active wave-formed or bedrock shoreline features lacking; 3) water depth in the deepest part of basin less than 2 m at low water; and 4) salinity due to ocean-derived salts less than 0.5 ‰.
- Particulate drift** - Organic material generally $>0.45 \mu\text{m}$ in diameter, suspended in the water column and moved along by water currents.
- Perched wetland** - Wetland that is above the regional aquifer and maintained by beds of clay, silt or unfractured consolidated rock.
- Periphyton** - The microfloral growth, consisting mainly of algae, attached to a substrate in aquatic systems.
- Permeability** - The ability of a membrane to allow various substances to pass through it.
- Perturbation** - A disturbance to an ecosystem.

pH - Indicates the hydrogen ion activity in water by measuring the acid-base equilibrium of various dissolved components. Its measurement is important in assessing the chemical equilibrium of many chemical and biochemical reactions (e.g., the toxicities of certain substances increase or decrease depending on shifts in chemical equilibrium).

Photic zone - The region in a water column where there is sufficient light penetration to stimulate primary production.

Phytoplankton - The community of algae suspended in the water column, non-motile, or insufficiently motile to overcome transport by currents.

Piezometer - Shallow water well used to measure groundwater elevations.

Pioneer species - Early invaders of new or disturbed habitats.

Porosity - The ratio of the volume of void spaces in a rock or sediment to the total volume of the rock or sediment.

Potentiometric surface - For a confined aquifer, the level to which water will rise in a well.

Primary consumer - Organisms that feed on plants.

Primary producer - Organisms that use radiant energy to convert inorganic materials to tissue, generally plants.

Primary production - The use of radiant energy in photosynthetic or chemosynthetic activity to produce organic substances which can be used as food material.

Radionuclide - A substance which is radioactive. Common radionuclides examined in Florida include gross alpha and beta particles, radium-226, radium-228, tritium, and strontium-90.

Recharge - The refilling of an aquifer generally by water infiltration downward through the soils.

Relative density - $\frac{\text{number of individuals of a species}}{\text{number of individuals of all species}} \times 100$

Relative dominance - $\frac{\text{total basal area of a species}}{\text{total basal area of all species}} \times 100$

Relative frequency - $\frac{\text{number of points of occurrence of a species}}{\text{number of points of occurrence of all species}} \times 100$

Rhizomatous - Pertaining to a subterranean plant stem, usually horizontal, which produces shoots above and roots below.

Riverine - Pertaining to rivers; includes all wetlands and deepwater habitats contained within a channel, with two exceptions: 1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and 2) habitats with water containing ocean-derived salts in excess of 0.5 ‰.

Riparian - Situated or dwelling along the banks of streams or other waterbodies.

Rookery - A breeding place for birds.

Scarp - A line of cliffs or slopes formed by the faulting or fracturing of the earth's crust.

Secondary consumer - Organisms that feed on other consumers such as carnivores or scavengers.

Seep - A concentrated groundwater outflow from the Surficial Aquifer or the Secondary Artesian Aquifer to surface waters.

Settling areas - An excavated area through which mine water is conducted in order to reduce its velocity, thus allowing suspended solids to settle. Clarified water normally overflows from an outfall structure at adjustable water elevations.

Shannon-Weaver Diversity Index - A formula used to measure the quality of the environment and the effect of induced stress on biological communities, particularly macroinvertebrates.

Similarity - A formula (page 3-302) for comparing the similarity of the species composition of biological communities.

Shoreline Development Index - The ratio of the length of the shoreline to the length of the circumference of a circle of area equal to that of the lake.

Surficial Aquifer - An aquifer close to the ground surface.

Soil Erodibility Factor - A term expressed in tons/acre/rainfall for a 9% slope, 72.6 ft long, with no vegetation. The factor takes into account properties that have the greatest effect on erodibility.

Species area curve - A method of successively sampling to determine the number of samples necessary to adequately characterize a biological community.

Spoil - The overburden or non-ore materials removed in gaining access to the ore or mineral material in surface mining.

Spring - A concentrated groundwater outflow from the Floridan Aquifer to the surface water.

Stage - Any of the several divisions of stratified rocks forming a period corresponding to a single age.

Stratigraphic - Pertaining to the composition sequence and correlation of stratified rocks.

Standing crop - The amount of organic material per unit area present at any one time.

Stricking - Dispersing spoil piles to predetermined or design elevation, usually near the original ground elevation.

Tailings - The sandy material remaining after most of the ore-containing matrix has been extracted.

Threatened species - Any species of fish and wildlife naturally occurring in an area which may not be in immediate danger of extinction, but which exists in such small populations as to become endangered if it is subjected to increased stress as a result of further modification of its environment.

Tolerant - Organisms frequently associated with gross organic contamination; generally capable of thriving under anaerobic conditions.

Transmissivity - The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient.

Transpiration - The giving off of moisture through the surface of leaves and other parts of plants.

Turbidity - A measure of the degree of cloudiness present in water caused by suspended matter (clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and/or plankton). Turbidity measured in water is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines.

Wetland - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands Evaluation Procedure (WEP) - A wetlands evaluation system developed by the U.S. Army Corps of Engineers and based on the analysis of physical, biological, and human-use characteristics.

Wetrock - Wet phosphate ore.

Weir - A dam-type structure with an opening to allow water passage; used to constrict flow into a narrow channel for easy measurement.

Xeric - Very dry habitat.

Xerophytic - Any plant growing in a habitat in which an appreciable portion of the rooting medium dries to the wilting coefficient at frequent intervals.

Zooplankton - The community of animals, generally microscopic protozoans and crustaceans, usually swimming or suspended in water, non-motile or insufficiently motile to overcome transport by currents.

1.0 INTRODUCTION

1.1 Location of Mine Site

The land holdings of Occidental Chemical Agricultural Products, Inc. (OXY) are located in Hamilton County, Florida approximately 60 mi west of Jacksonville, Florida and 40 mi south of Valdosta, Georgia (Figure 1.1-1). The project area is located immediately north of White Springs, Florida and generally south and east of Jasper, Florida (Figure 1.1-2). The project area boundary encompasses about 100,000 acres and corresponds approximately to the boundary in the Development of Regional Impact (DRI) application OXY submitted to the Florida Department of Administration, Division of State Planning, Bureau of Land Planning in December 1973. The DRI application was reviewed and approved by the North Central Florida Regional Planning Council and Hamilton County Board of County Commissioners for mining of all reserves within the DRI boundary with the exception of reserves within 1) the 100-yr floodplain of the Suwannee River, 2) the floodplains of major creeks for at least 0.5 mi upstream from each creek's confluence with the Suwannee River, and 3) a 500-ft radius of any third-magnitude or larger spring or any major sinkhole (Figure 1.1-3). The site is within the Suwannee River basin and the Suwannee River Water Management District (SRWMD). The project area is surrounded mainly by pine forests which are managed for pulp and paper production by companies and individuals other than OXY.

1.2 Background and Present Situation

OXY is seeking dredge and fill permits from the U.S. Army Corps of Engineers (ACOE) to continue its existing phosphate mining operations in Hamilton County, Florida. OXY's acquisitions of phosphate reserves in Hamilton County were initiated in the early 1960's. OXY currently operates two phosphate mines and two agricultural chemical complexes. The Suwannee River Mine began production in 1965 with the Suwannee River Chemical Complex beginning production in 1966. The Swift Creek Mine began production in 1975 and the Swift Creek Chemical Complex began production in 1979. An Environmental Impact Statement (EIS) was prepared and subsequently published in 1978 prior to construction of the Swift Creek Chemical Complex. Thus, the current permit application is for continued mining only and does not involve the chemical complexes.

During the remaining life of the mines, OXY proposes to mine approximately 26,000 acres of reserves and utilize an additional 4500 acres for mine support activities within the 100,000-acre project area. Approximately 25,000 acres (25%) of the project area are characterized as wetlands and the remainder as uplands. Approximately one-third (7900 acres) of the wetlands are proposed for mining. An additional 1300 wetland acres will be disturbed in connection with mine support activities.

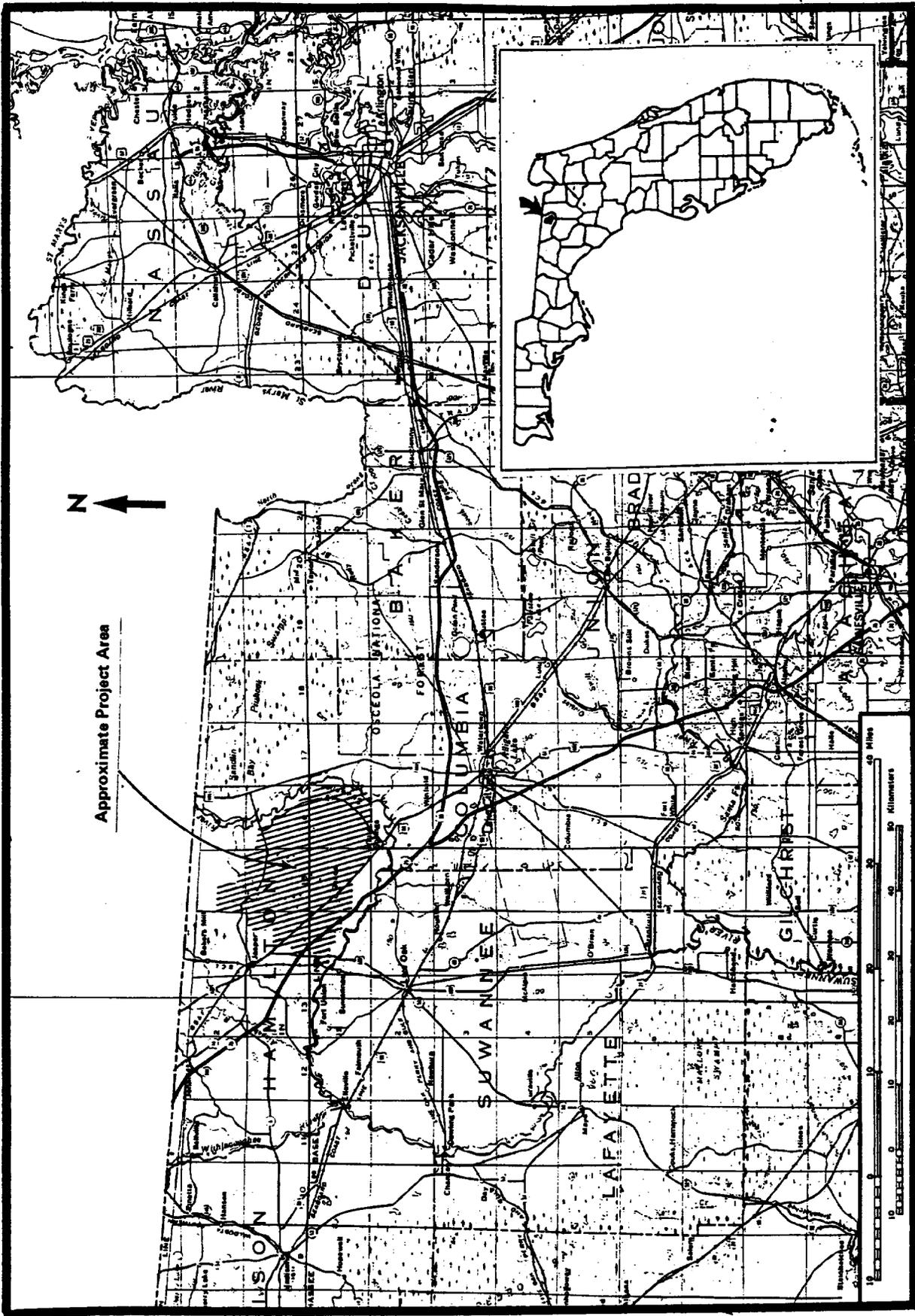


Figure 1.1-1. General Location of OXY Project Area.

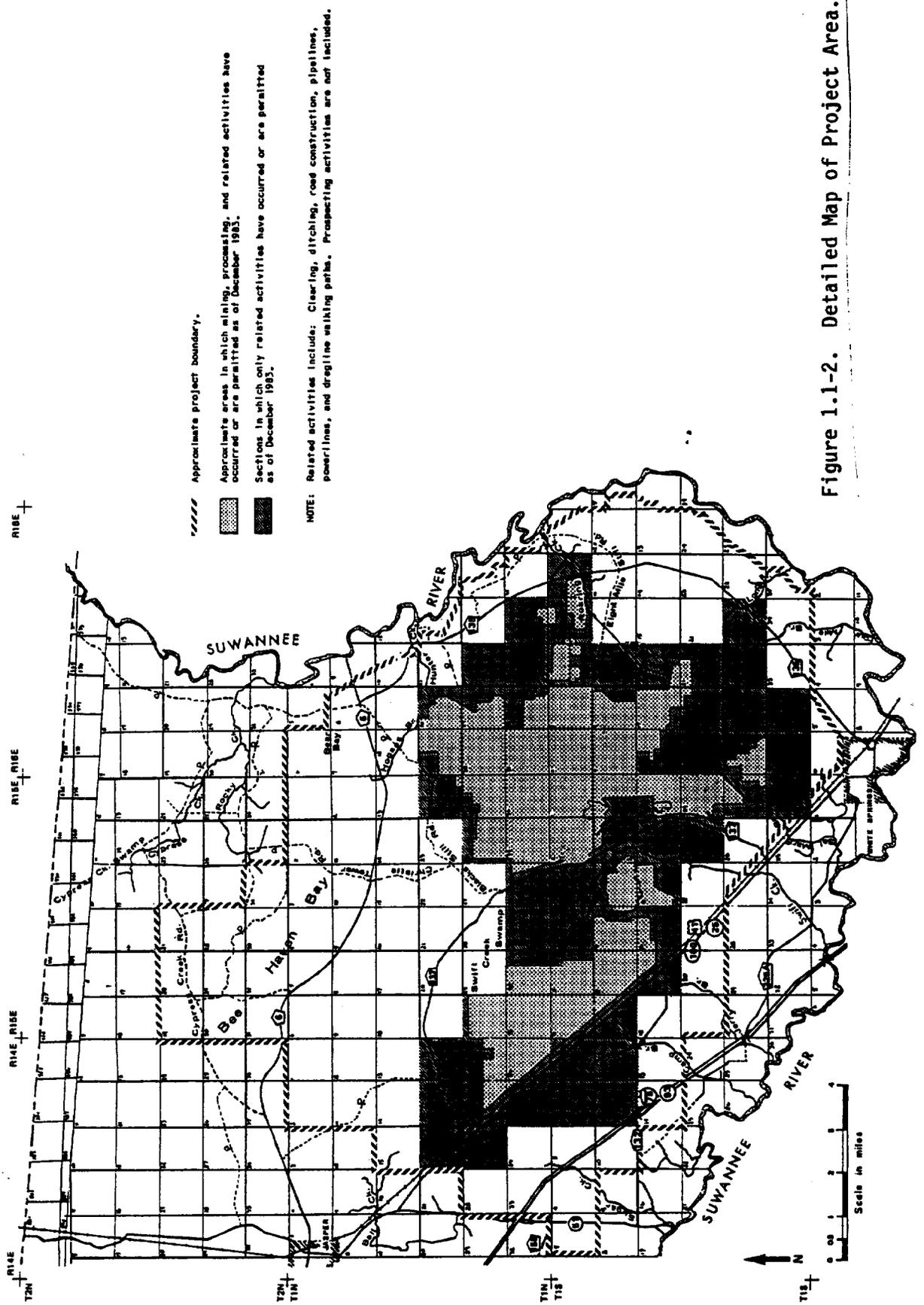
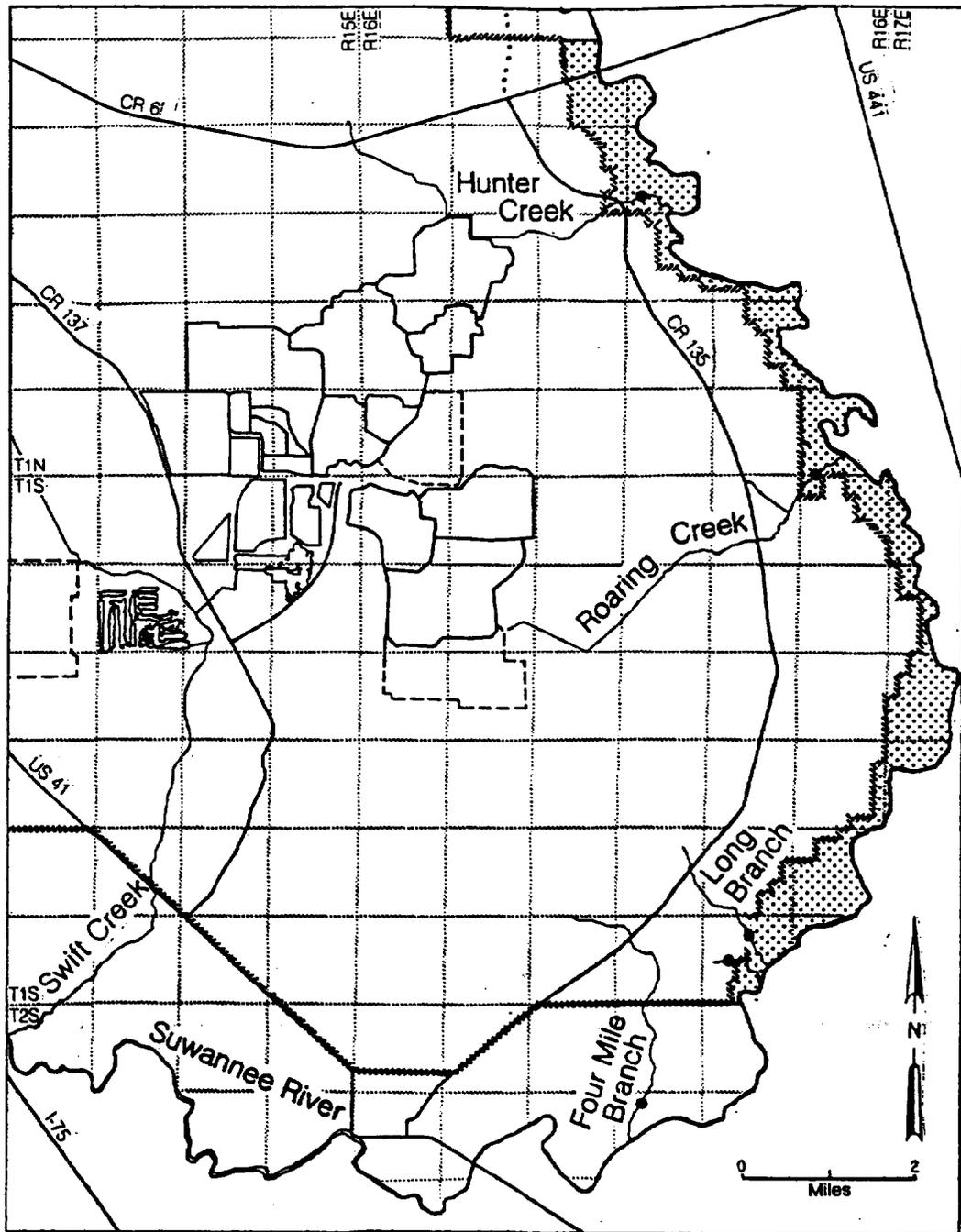


Figure 1.1-2. Detailed Map of Project Area.



- 0.5 mi upstream from Suwannee River
- ▨ 100-yr floodplain of Suwannee River
(shown only in areas contiguous to the project boundary)

Figure 1.1-3. Approximate Area Within Hamilton County Protected by DRI Agreement.

The exact extent of ACOE jurisdiction and the area requiring permitting for dredge and fill operations will not be finally determined until completion of the permitting process. However, the following definition, as outlined by the ACOE, will pertain to this project:

"Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Most of the rock produced by the continuing mining operations will be used by the existing Suwannee River and Swift Creek chemical complexes. If OXY can obtain the necessary permits to mine wetlands containing mineable reserves which have been identified, OXY plans an estimated average production rate of 4.6 million tons of phosphate rock per year through mine-out of the Suwannee River Mine. After that time, production is expected to drop to an average of 1.7 million tons per year until mine-out of the Swift Creek Mine.

The existing production process involves open pit extraction of the phosphate matrix by large draglines, hydraulic transport to the beneficiation plants, separation of the phosphate product from the matrix at the beneficiation plants, and shipment of the product.

Within the project area, several small tributaries provide drainage to the Suwannee River: Rocky Creek, Hunter Creek, Roaring Creek, Long Branch, Four Mile Branch, Sal Marie Branch, Swift Creek, Camp Branch, Jerry Branch, Sugar Creek, Ratliff Creek, and several small unnamed creeks. Some mining and associated support facilities are planned within these stream systems; however, major areas will be left untouched. The Florida Department of Environmental Regulation (FDER) has asserted dredge and fill jurisdiction over portions of the project area. OXY previously has agreed not to mine within the 100-yr floodplain of the Suwannee River as delineated by the project boundary (Figure 1.1-3).

1.3 Existing Regulatory Requirements

Under authority of Section 404 of the Clean Water Act of 1977, the ACOE asserted discretionary authority over certain wetlands in the Hamilton County project area in a letter to OXY dated 13 February 1981. The letter stated that the preparation of an EIS under this act and the National Environmental Policy Act of 1969 would be required.

Subsequent to this determination, a scoping meeting was held by the ACOE at their district offices on 5 June 1981. A Plan of Study (ACOE 1981) for the Technical Background Document was developed based on input from the scoping meeting.

In January 1981 OXY submitted a proposed mine plan to the ACOE to cover three years of mining during preparation of the EIS. After agency review of the plan, site visits, negotiations of the actual mining areas, and public notice and comment, a permit was issued by the ACOE on 14 April 1982.

On 22 July 1982 the ACOE published new interim final rules governing the Section 404 regulatory program [Federal Register 47(141):31794ff, 22 July 1982]. The new regulations transferred assertion of ACOE discretionary authority over wetland areas above the mean annual 5 cfs point from the ACOE districts to the division offices. An automatic lapse provision in the new regulations stated that previous assertions of discretionary authority by the districts would lapse on 22 November 1982 if the division did not affirmatively reassert prior to that time. Because of the complexity of the OXY situation, the ACOE South Atlantic Division (SAD) was not able to make a decision on the reassertion by 22 November 1982. The SAD decided to reassert discretionary authority over OXY's mining operations on 28 February 1983.

OXY's mining operations are also controlled by many other regulations. Table 1.3-1 provides a brief listing and summary of the additional regulations which apply to OXY.

1.4 Proposed Action

OXY has developed four mining alternatives for its existing phosphate mining in Hamilton County:

- A. No Mining or Mine Support in Wetlands
- B. Mining All Wetlands Containing Reserves
- C. Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves
- D. Mining in Areas Requiring Only ACOE Permits

Mining of upland areas (Alternative A) may be conducted with or without this EIS, as no dredge and fill permits would be required.

Mining procedures are described in Section 2.1, and the details of each alternative are discussed in Section 2.2. OXY's preferred alternative is Alternative B: Mining All Wetlands Containing Reserves. Under this alternative, the mine operation would disturb approximately 30,500 acres or 31% of the project area. Approximately 26,000 acres or 85% of the acreage to be disturbed is scheduled for actual mining. The remaining 15% of the disturbed acreage will be used for waste clay disposal. Existing land use patterns would continue on reserve lands until those lands are scheduled for mining. Approximately 54,300 acres would remain undisturbed.

The existing production process will be utilized (Figure 1.4-1). When at full production, five or six large walking draglines will operate simultaneously, mining and extracting ore from separate areas. The ore will be slurried and transported hydraulically in pipelines to the Swift Creek and Suwannee River beneficiation plants for disaggregation and

Table 1.3-1. Regulations Currently Applicable to OXY Operations.

| Regulation | Agency | Purpose |
|--|---|--|
| Ch. 16C-16 and Ch. 16C-17, FAC | FDNR | Control of reclamation on all mined areas |
| Ch. 17-2, FAC | FDER | Air quality standards |
| Ch. 17-3 and Ch. 17-4,243-.245, FAC | FDER | Protection of both surface water and groundwater quality |
| Ch. 17-3,041 and Ch. 17-4,242, FAC | FDER | Outstanding Florida Waters pro- tection |
| Ch. 17-4 and Ch. 17-12, FAC | FDER | General permitting requirements, including dredge and fill activi- ties within State waters |
| Ch. 17-6, FAC | FDER | Regulation of sewage treatment plants and phosphate mining effluents |
| Ch. 17-9, FAC | FDER | Design criteria and permitting of dams for waste clay disposal areas |
| Ch. 17-22, FAC | FDER | Standards for drinking water and water supply systems |
| Ch. 40B-2, FAC | SRWMD | Control of water usage in Suwannee River basin |
| Hamilton Co. Mining Ordinance | Hamilton Co. Board of Commissioners | Control of general mining operations |
| Hamilton Co. Flood- plain Ordinance | Hamilton Co. Board of Commissioners | Construction within Suwannee River 100-year floodplain |
| 33 CFR Parts 320-330 Revised 22 July 1982 | ACOE | Protection of water quality through individual permitting of areas below 5 cfs (annual average) point |
| 40 CFR Parts 122-125 | EPA | National Pollutant Discharge Elimination System; protection of water quality |
| 40 CFR Part 50 | EPA | Air quality standards |
| Public Law 95-164 and 95-133 | MSHA | Control of noise, dust, and other industrial hygiene factors |

CFR: Code of Federal Regulations
 FAC: Florida Administrative Code
 FDER: Florida Department of Environmental Regulation
 FDNR: Florida Department of Natural Resources
 MSHA: Mine Safety and Health Administration
 SRWMD: Suwannee River Water Management District
 ACOE: U.S. Army Corps of Engineers
 EPA: U.S. Environmental Protection Agency

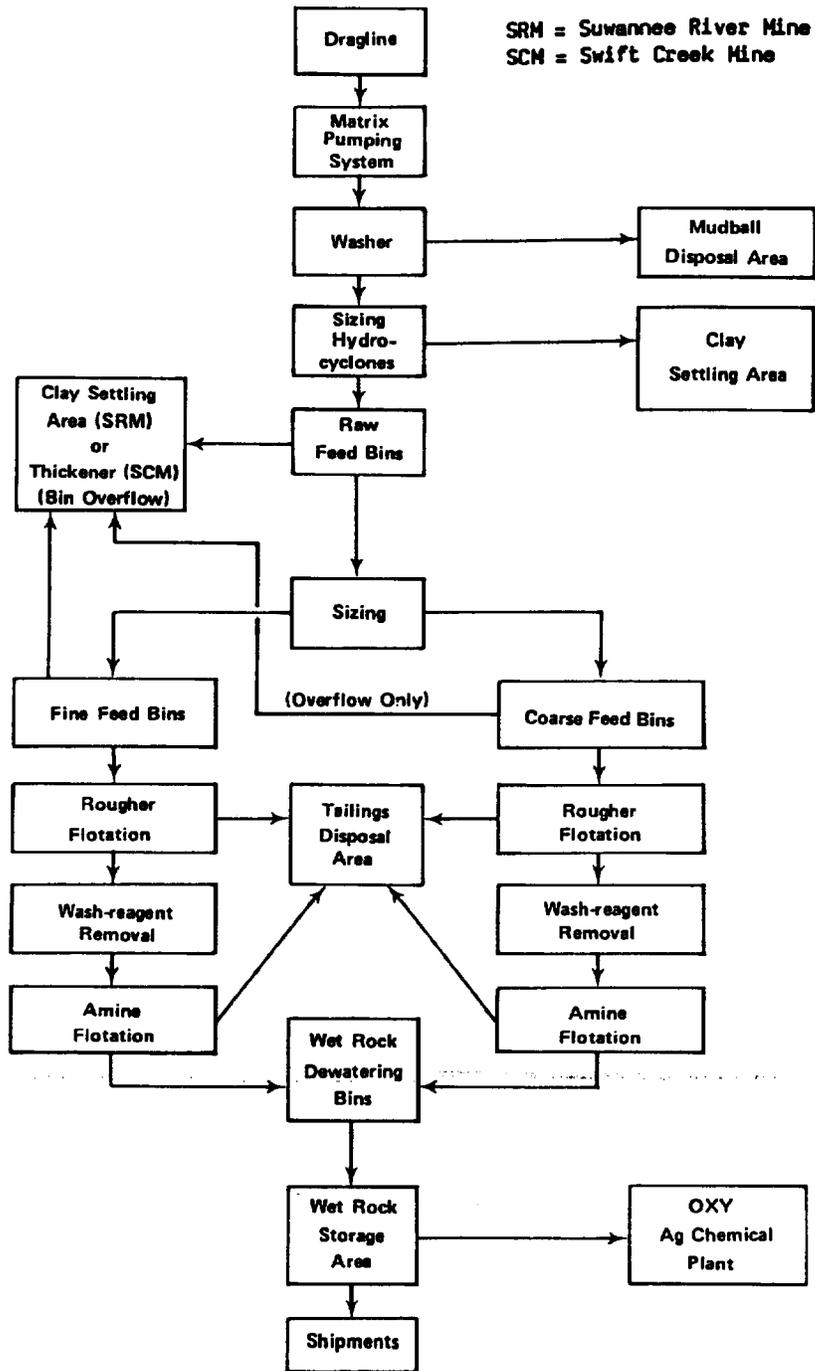


Figure 1.4-1. Flow Chart of Production Process.

recovery of phosphate. Sand-sized phosphatic particles will be concentrated by flotation methods. Wetrock will be stockpiled on site. Residual clay will be redeposited on the property in clay impoundment areas. Sand tailings will be utilized for dam construction and reclamation.

1.5 EIS Coverage

The ACOE asserted discretionary jurisdiction over OXY's Hamilton County project area. The exact extent of ACOE jurisdiction will be determined in the permitting process. The EIS addresses impacts to all wetlands within the project area that would be disturbed under alternative mine plans, regardless of whether they are within ACOE jurisdiction. Chemical plant operations are not addressed in this EIS, except to the extent that their life would be shortened by some of the mining alternatives that would cause significant loss of reserves. In 1977, under the direction of the U.S. Environmental Protection Agency (EPA), OXY completed a comprehensive new source EIS for the Swift Creek Chemical Complex (EPA 1978). That EIS also contained a large volume of information about the existing Suwannee River Chemical Complex.

1.6 Literature Cited

- U.S. Army Corps of Engineers (ACOE). 1981. Plan of Study: Environmental Impact Statement, Occidental Chemical Company Proposed Wetlands Mining, Hamilton County, Florida. September 4, 1981.
- U.S. Environmental Protection Agency (EPA). 1978. Draft environmental impact statement for proposed issuance of a new source National Pollutant Discharge Elimination System permit to Occidental Chemical Company Swift Creek Chemical Complex, Hamilton County, Florida. Resource Document Vols. I-IV. U.S. EPA Region IV, Atlanta. EPA-904-9-78-012-A,B,C,D (NTIS #PB-286040 through PB-286044).

2.0 MINING ALTERNATIVES

2.1 Mining Processes

Four mining alternatives have been developed which address the continuation of phosphate mining operations in Hamilton County:

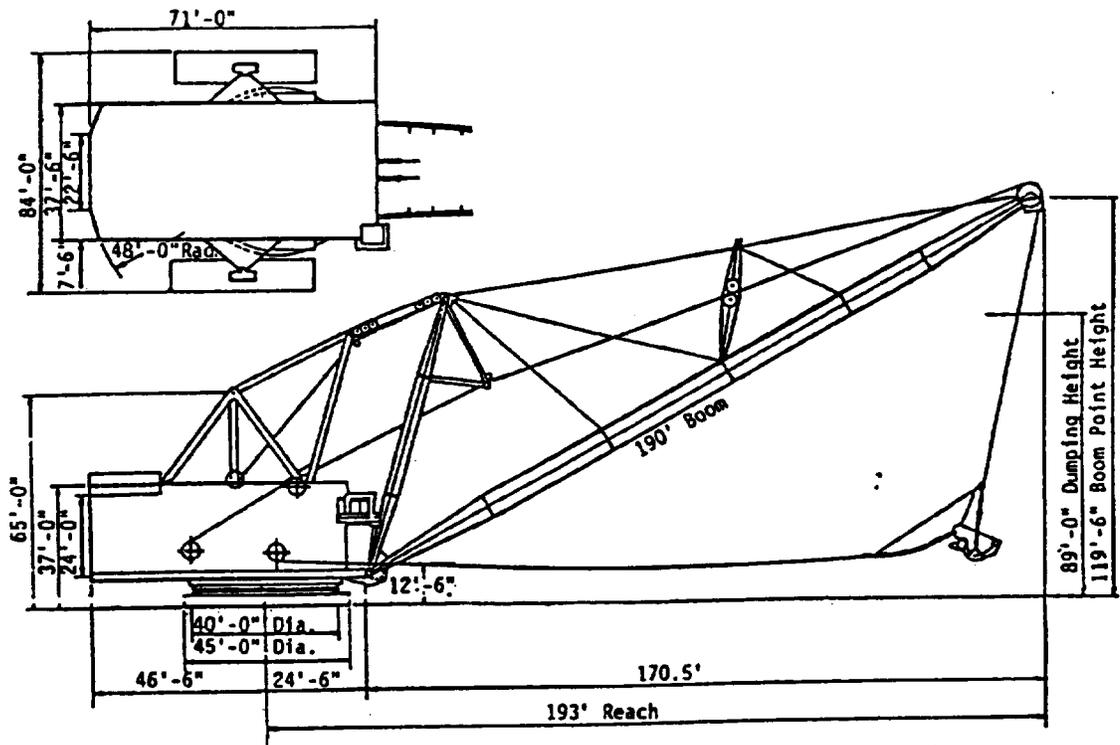
- Alternative A: No Mining or Mine Support in Wetlands;
- Alternative B: Mining All Wetlands Containing Reserves;
- Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves; and
- Alternative D: Mining in Areas Requiring Only ACOE Permits.

Mining, water use, waste disposal, and reclamation will follow the same procedures and techniques currently in use. In all four alternatives, upland areas containing reserves presently owned or leased by OXY are proposed for mining. Alternative A, which proposes mining of upland areas only, may be conducted with or without this EIS, as no dredge and fill permits would be required. However, OXY would still have to comply with other permitting requirements (Section 1.3). The remaining alternatives involve mining wetlands containing reserves presently owned or leased by OXY. Potential future acquisitions have not been addressed because of the uncertainties involved. However, the percentages developed in the four alternatives should remain valid.

2.1.1 Mining

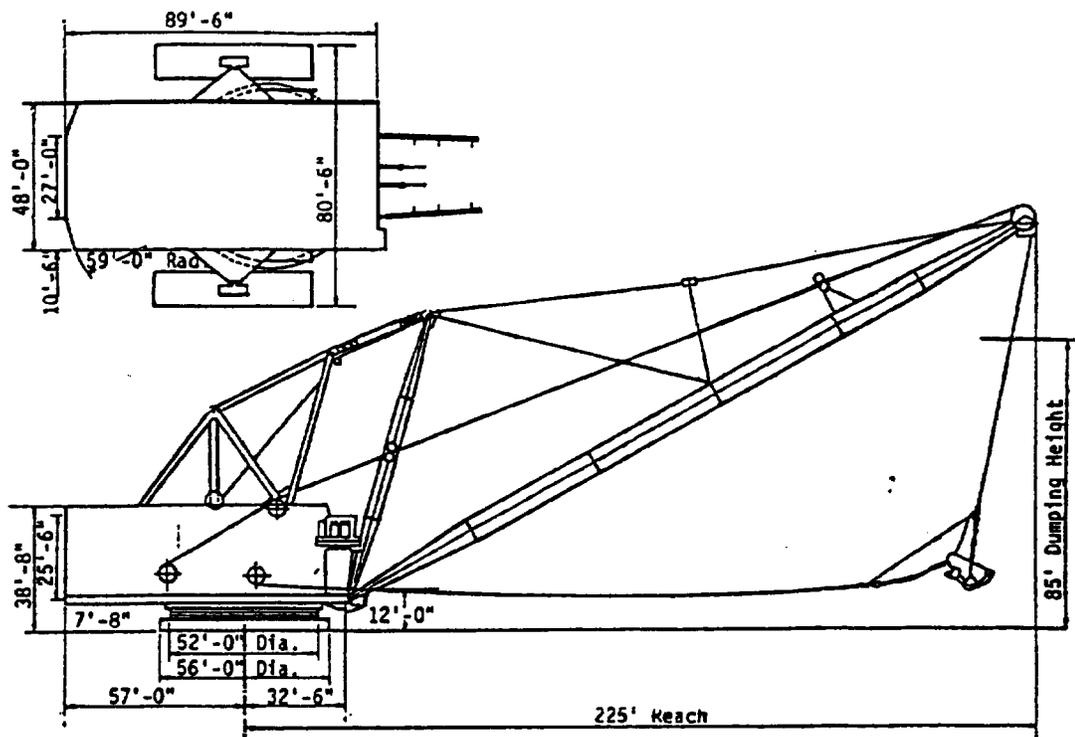
The mining operations for the four alternatives are similar. All work in an area is preceded by prospecting to determine if the area meets minimum reserve criteria. Initial prospecting may be conducted on a 40-acre pattern (drilling on 1320-ft centers) to determine existence of the resource. After the existence of an economically mineable resource is determined, the drilling pattern is tightened until a 2.5-acre pattern is complete (drilling on 330-ft centers). Interim reserve estimates are made when the drilling density reaches 1 hole per 20 acres. Once a 2.5-acre drilling pattern is complete, final reserve geometry can be determined and final mining plans developed.

Preparation of the mining area begins with installation of drainage ditches to remove surface water and to isolate the mining block (usually a 40-acre minimum based on economic constraints of the mining operation) from surrounding lands. The sites are then cleared, and internal ditches, access roads, pipelines, and powerlines are constructed. Overburden and matrix are removed within the perimeter ditches by large walking draglines (Figures 2.1-1 and 2.1-2). The draglines normally advance in a series of parallel cuts 250-330 ft wide, stripping the overburden from above the matrix. After the matrix is exposed, it is mined by the dragline, dumped into slurring pits, and pumped to the flotation



| | | | |
|--|----------------|---|----------|
| Length of Boom | 190 | Variable Voltage Drag Motors (2 used) | 425 HP |
| Reach fm. Center Pin, 30° Boom Angle (ft) | 193 | Variable Voltage Hoist Motors (2 used) | 425 HP |
| Maximum Dumping Height, 30° Boom Angle (ft) | 73 | Main M.G. Set driven by A.C. Synchronous Motor | 1250 HP |
| Net Wt. (lbs) | 1,995,000 | Variable Voltage Swing Motors (3 used) | 137.5 HP |
| Ground Pressure (approx.) | 10.04 psi | Swing M.G. Set driven by A.C. Induct. Motor | 600HP |
| Shoes | 8'-0" X 40'-0" | Variable Voltage Walking Motor | 425 HP |
| Normal Walking Speed | 18 fpm | | |
| Diameter of Drag Cable (2 used) | 2.5" | | |
| Diameter of Hoist Cable (2 used) | 2" | | |

Figure 2.1-1. Model 740 Page Walking Dragline.



| | |
|--|-----------------|
| Ground Pressure (approx.) (Oversize Base also avail.) | 10.4 psi |
| Swing Speed, Nominal Max. | 2.0 RPM |
| Shoes | 10'-6" X 49'-0" |
| Normal Length of Step | 6'-10" |
| Normal Walking Speed | 18 fpm |
| Diameter of Hoist & Drag Cables (2 used) | 2.75" diam. |

| | |
|---|----------|
| Variable Voltage Drag Motors (2 used) | 625 HP |
| Variable Voltage Hoist Motors (2 used) | 625 HP |
| Main M.G. Set driven by A.C. Synchronous Motor | 2000 HP |
| Variable Voltage Swing Motors (4 used) | 137.5 HP |
| Variable Voltage Walking Motor | 625 HP |

Figure 2.1-2. Model 752 Page Walking Dragline.

plant for processing. Matrix slurry lines are located inside the mine area, to the extent possible, to minimize the amount of disturbed lands. The number of draglines in use, mining schedule, length of mine life, and acreages disturbed vary depending on the alternative. The specifics of these plans are discussed individually under each mining alternative (Section 2.2).

2.1.2 Matrix Transportation

Each dragline has an independent matrix pumping system to transport the matrix slurry from the pit to the beneficiation plant. The system includes a gun car or pit car where approximately 10,000 gallons per minute (gpm) of water are used at a pressure of 200 pounds per square inch (psi) to slurry the matrix. The matrix slurry is picked up by a 1500 HP pit pump and pumped at an average rate of approximately 1500 cu yd per hour through a series of 1250 HP variable speed booster pumps. The pumps are connected by 20-in (outside diameter) ground level steel pipes. Water for the matrix transportation system may come from the mines' recirculating water systems or from drainage systems and previously mined pits utilized for water conservation.

Power is delivered to each mine through a 115,000-volt Florida Power Corporation (FPC) main transmission line to a centrally located sub-station. From the FPC sub-station, 25,000-volt overhead powerlines carry electricity to strategically placed sub-stations for the various electric equipment throughout the mines. Where practical, sub-stations are placed with the particular installation. Where impractical to run an overhead line directly to the equipment, as in the case of the large draglines and the pit car, sub-stations are strategically located and ground lines (cables) carrying the specific voltage needed by the particular piece of equipment are run.

2.1.3 Beneficiation

The matrix pumping system discharges into a distribution box at the top of the washer. It then passes through 3/4-in trommel screens to remove oversize matrix material (called mudballs) which is transported to the mudball disposal area. The pebble (-3/4 in +16 mesh) removed by the washer is visually inspected for quality, and acceptable material (normally -1/4 in +16 mesh) is sent to the rodmill for grinding and preparation as flotation feed. Poor quality material is added to the oversize trommel discharge and pumped to the mudball disposal area. The combined oversize and poor quality pebble material often contains clay balls, hence the term "mudballs." Mudballs are normally used for reclamation because they provide a good growing medium for vegetation and a stable working surface. The -16 mesh material is sized (-150 mesh material removed) by cyclones and reports to the raw feed bins at the flotation plant. The -150 mesh material reports to a primary waste clay disposal area.

The flotation plant sizes the raw feed into coarse (-16 +35 mesh) and fine (-35 +150 mesh) feed. In the flotation plant the sized feed goes

through a dual flotation process. In the first process a rougher concentrate product is floated, with the underflow (sand tailings) pumped to the tailings disposal area. The rougher concentrate is introduced to the second flotation process where the sand tailings are floated and pumped to the tailings disposal area; the underflow (concentrate) is sent to the wetrock storage pile.

2.1.4 Water Use During Mining and Processing

Phosphate mining and processing operations use water for slurring, transporting, washing, and sizing the phosphate matrix. Waste clay generated by the processing is introduced to retention areas where the clay settles and clear water is decanted and recycled for plant use. Figure 2.1-3 illustrates a general water flow cycle for the mining operation. All four mining alternatives will have similar water flow cycles.

All plant water is recirculated, with losses amounting to approximately 10% of the total requirements. These losses, which are due to seepage, product shipping, evaporation, and clay adsorption, are replaced by deep wells. These wells produce an average of 28 million gallons per day (mgd) with a daily maximum of approximately 43 mgd. During periods of heavy precipitation, excess water is released from clay settling areas into the recirculating water system and discharged under authorization of FDER and EPA permits.

2.1.5 Waste Disposal

Three major waste byproducts of the mining process are considered in the waste disposal plan: 1) waste clay, 2) mudballs, and 3) sand tailings. Clays from the matrix adsorb substantial quantities of water during processing which increases the clays' volume. These waste clays are typically gravity flowed at 1-3% solids into low-diked containment areas where they are retained until the clays settle out. Two to four years after clays are no longer introduced into these settling areas, the clays should consolidate to an average of 20% solids. The clarified water is decanted off the disposal areas and returned to the beneficiation plant, via the recirculating water system, for reuse.

Mudball waste material is used for capping and reclamation of waste clay settling areas and for dam stabilization. Mudballs are hydraulically pumped from the flotation plant to the area to be capped. Sand tailings are used in reclamation to backfill mine cuts and cap waste clay settling areas. They are also used to construct and stabilize dams for waste clay containment areas. The design, construction, operation, inspection, maintenance, and abandonment of all impoundment dams comply with the provisions of Chapter 17-9 of the Florida Administrative Code (FAC). Average dike heights are 24 ft above grade, with the average elevation of the clays approximately 19 ft above grade immediately after filling and before consolidation.

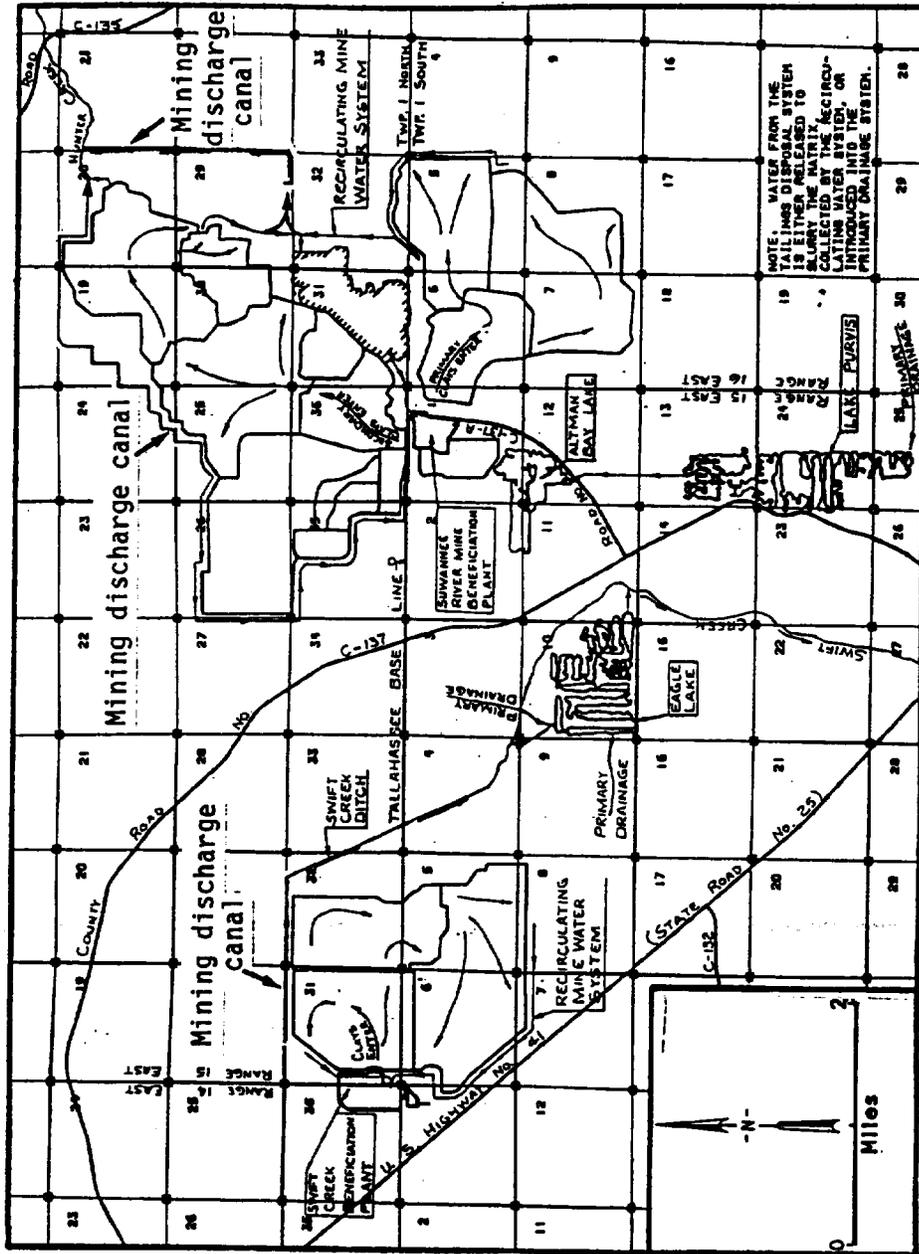


Figure 2.1-3. Schematic Diagram of Current Mine Surface Water Flow.

Waste disposal for each mining alternative is identical in technique; however, quantities and placement of waste material vary with each mining alternative and thus are discussed separately for each alternative (Section 2.2).

2.1.6 Drying, Grinding, and Shipping

Wetrock is shipped from the wetrock storage pile by a conveyor constructed in a tunnel beneath the pile. Wetrock is fed either to a cross-country conveyor for transfer to the chemical plant or conveyed to a fluid-solids dryer installation. The dryer installation reduces the moisture content of wetrock from approximately 16% to 2% by weight. Additionally, the Suwannee River Mine has a 30-ton per hour ballmill for grinding of phosphate rock. The ground rock and dry unground rock are stored in holding bins for shipment by truck or rail.

2.2 Mining Alternatives

Acreages of mining, reclamation, and waste disposal areas for the four mining alternatives presented in the following sections were calculated in conjunction with the OXY mines planning computer programs and are based on many variables. Although the numbers appear precise, they are estimates based on the best available information at the time of their calculation. Locations of wetlands within the Suwannee River and Swift Creek mines are shown in Overlays A and B, respectively (map pocket). The overlays should be used only for general orientation purposes. They are not intended for precise comparison with the mining alternative maps because of their small scale and minor distortions as a result of the reproduction process.

2.2.1 Alternative A: No Mining or Mine Support in Wetlands

2.2.1.1 Alternative Description

Under Alternative A, no wetlands that are not already permitted are proposed for mining or mine support activities. Only those areas designated as uplands that contain reserves owned or leased by OXY will be mined. Uplands may be mined on the project area regardless of the alternative selected. The Suwannee River Mine will operate one 45 cu yd and two 30 cu yd draglines. The flotation plant will have an estimated average annual production rate of approximately 2.4 million tons of concentrate for mining years 1-8. The Swift Creek Mine will operate two 45 cu yd draglines, and average annual production rate is estimated to be 1.9 million tons of concentrate for mining years 1-10. This alternative will result in extraction of only 37% and 32% of the mineable reserves on the Suwannee River Mine and Swift Creek Mine, respectively, and will shorten the planned mine life by 13 years (62%) and 16 years (62%), respectively. The remaining reserves underlie wetlands and areas under FDER jurisdiction or would be lost due to mining restrictions resulting from having to avoid wetland areas.

2.2.1.2 Mining Schedule for Alternative A: No Mining or Mine Support in Wetlands

A total of approximately 9183 acres of uplands will be mined under this alternative (Table 2.2-1). An additional 701 acres will not be mined but will be utilized for waste clay disposal. Yearly averages for mining will be 567 acres for the Suwannee River Mine over a 7-year period (excluding the partial year 8) and 518 acres for the Swift Creek Mine over a 9-year period (excluding the partial year 10). The mining areas for the Suwannee River and Swift Creek mines are depicted in Figures 2.2-1 and 2.2-2, respectively. Table 2.2-2 presents acreages of the various land use and cover types that would be mined and/or utilized for mine support activities under this alternative.

Table 2.2-1. Mining Schedule and Acreages for Suwannee River and Swift Creek Mines, Alternative A: No Mining or Mine Support in Wetlands.

| Year | Suwannee River Mine | Swift Creek Mine | Year Total | Cumulative Total |
|--------------|---------------------|------------------|-------------|------------------|
| 1 | 587 | 530 | 1117 | 1117 |
| 2 | 568 | 521 | 1089 | 2206 |
| 3 | 542 | 516 | 1058 | 3264 |
| 4 | 577 | 566 | 1143 | 4407 |
| 5 | 654 | 453 | 1107 | 5514 |
| 6 | 519 | 527 | 1046 | 6560 |
| 7 | 521 | 533 | 1054 | 7614 |
| 8 | 428 | 507 | 935 | 8549 |
| 9 | 0 | 508 | 508 | 9057 |
| 10 | 0 | 126 | 126 | 9183 |
| Total | 4396 | 4787 | 9183 | 9183 |

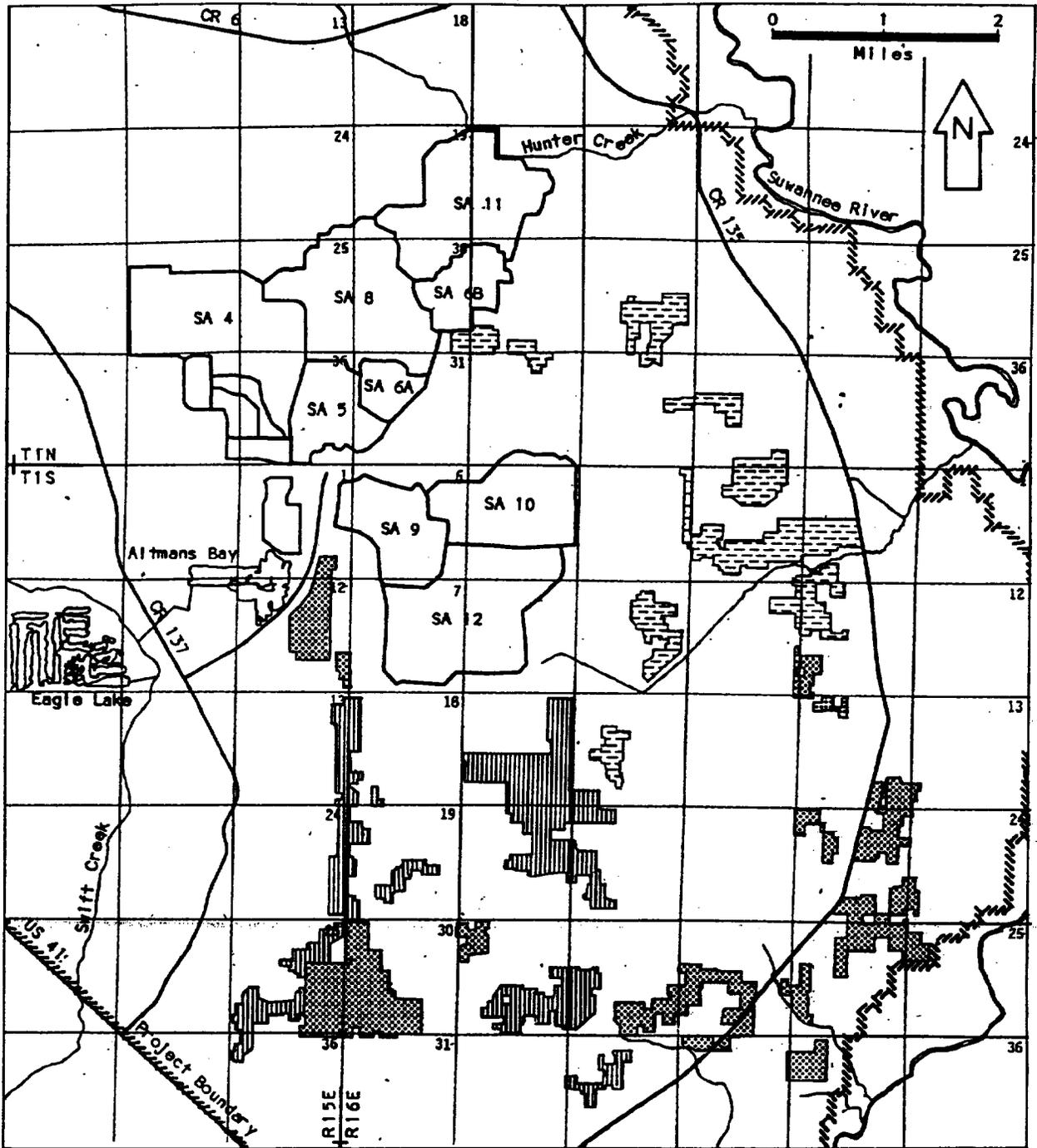


Figure 2.2-1.
 Mining Areas for Suwannee River Mine, Alternative A:
 No Mining or Mine Support in Wetlands.

-  Dragline Number 1
-  Dragline Number 2
-  Dragline Number 3
-  SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

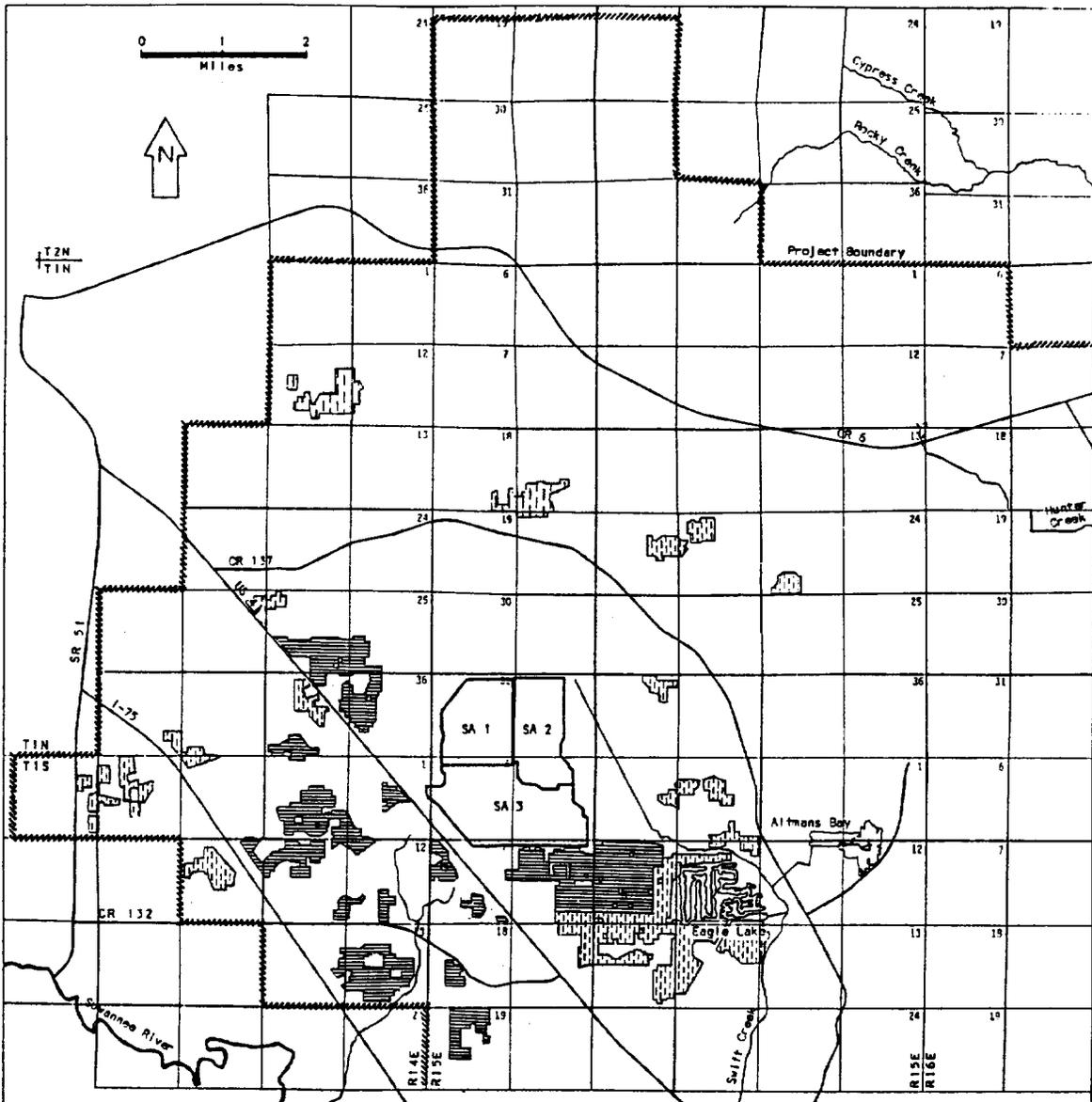


Figure 2.2-2.
 Mining Areas for Swift Creek Mine, Alternative A:
 No Mining or Mine Support in Wetlands.

Dragline
 [Horizontal Hatching] Number 4
 [Cross-hatching] Number 5
 SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-2. Acreages of Land Use and Cover Types to Be Mined for Alternative A: No Mining or Mine Support in Wetlands.

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|---------------------------|--|--|---------------------------------|---|---------------------------------|
| DEVELOPED AREA | | | | | |
| 111 | Residential, single unit, low density | 53 | <0.1 | 0 | 0 |
| 112 | Residential, single unit, medium density | 5 | <0.1 | 5 | 100.0 |
| 114 | Mobile homes, medium density | 18 | <0.1 | 0 | 0 |
| 123 | Offices and professional services | 20 | <0.1 | 0 | 0 |
| 131 | Light industrial | 13 | <0.1 | 0 | 0 |
| 144 | Major roads, highways, and railroads | 524 | 0.5 | 0 | 0 |
| 152 | Major long distance transmission lines | 27 | <0.1 | 0 | 0 |
| 162 | Religious facilities, excluding schools | 3 | <0.1 | 0 | 0 |
| 167 | Cemeteries | 4 | <0.1 | 0 | 0 |
| 193 | Land undergoing active development | 21 | <0.1 | 20 | 95.2 |
| | Subtotal | 688 | 0.7 | 25 | 3.6 |
| UPLAND COMMUNITIES | | | | | |
| 211 | Row crops | 3,976 | 4.0 | 349 | 8.8 |
| 212 | Field crops | 2,509 | 2.5 | 394 | 15.7 |
| 213 | Improved pasture | 1,302 | 1.3 | 40 | 3.1 |
| 222 | Deciduous fruit orchard | 1 | <0.1 | 0 | 0 |
| 231 | Pecan orchard | 1 | <0.1 | 0 | 0 |
| 242 | Confined feeding operations | 51 | <0.1 | 8 | 15.7 |
| 323 | Scrub/brush rangeland | 105 | 0.1 | 0 | 0 |
| 411 | Pine flatwoods | 3,935 | 3.9 | 372 | 9.4 |
| 422 | Other hardwoods | 87 | <0.1 | 25 | 28.7 |
| 431 | Mixed forest | 12,399 | 12.4 | 1,080 | 8.7 |
| 441 | Planted coniferous forest | 24,861 | 24.8 | 3,688 | 14.8 |
| 451 | Clearcut areas | 9,195 | 9.2 | 2,709 | 29.5 |
| 741 | Scraped areas | 8 | <0.1 | 5 | 62.5 |
| 742 | Dredge and fill areas | 382 | 0.4 | 119 | 31.2 |
| 760 | Mining and processing | 15,379 | 15.4 | 1,060 | 6.9 |
| | Subtotal | 74,191 | 74.0 | 9,849 | 13.3 |

Table 2.2-2 (Continued).

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|----------------------------|------------------------------|--|---------------------------------|---|---------------------------------|
| WETLAND COMMUNITIES | | | | | |
| 6110 | Cypress | 1,970 | 2.0 | 0 | 0 |
| 6211 | Swamp tupelo | 775 | 0.8 | 0 | 0 |
| 6212 | Bayhead | 1,322 | 1.3 | 0 | 0 |
| 6213 | Scrub/shrub | 1,314 | 1.3 | 0 | 0 |
| 6311 | Cypress/swamp tupelo/bay | 12,633 | 12.6 | 0 | 0 |
| 6312 | Swamp tupelo/bay/pine | 6,291 | 6.3 | 0 | 0 |
| 6410 | Emergent | 430 | 0.4 | 0 | 0 |
| | Subtotal | 24,735 | 24.7 | 0 | 0 |
| AQUATIC COMMUNITIES | | | | | |
| 513 | Canals | 66 | <0.1 | 2 | 3.0 |
| 521 | Mine pits reclaimed to lakes | 17 | <0.1 | 0 | 0 |
| 531 | Reservoirs | 434 | 0.4 | 0 | 0 |
| 561 | Ponds | 73 | <0.1 | 8 | 11.0 |
| | Subtotal | 590 | 0.6 | 10 | 1.7 |
| Total | | 100,204 | 100 | 9,884 | 9.9 |

¹Based on Florida Land Use and Cover Classification System (Fla. Dept. of Administration 1976).

²All acreages, percentages and totals have been rounded.

2.2.1.3 Type, Composition, and Quantity of Materials to Be Excavated or Filled for Alternative A: No Mining or Mine Support in Wetlands

Based on data from exploratory borings and existing mining operations, the following excavation quantities were calculated for this alternative:

| <u>Material</u> | <u>Approx. Total Excavation for Mine Life (cu yd)</u> | <u>Average Yearly Excavation Rate (cu yd)</u> |
|---------------------|---|---|
| Suwannee River Mine | 273,066,000 | 34,747,000 |
| Swift Creek Mine | 257,702,000 | 28,068,000 |

2.2.1.4 Waste Disposal for Alternative A: No Mining or Mine Support in Wetlands

A total of approximately 9152 acres of waste clay disposal areas (settling areas) will be utilized for both the Suwannee River and Swift Creek mines (Table 2.2-3). This includes 5881 acres of existing waste clay settling areas, 2071 acres of settling areas presently under construction for existing operations, and 1200 acres of waste clay settling areas proposed for construction under Alternative A (Figures 2.2-3 and 2.2-4). The majority of the waste clay settling areas are in operation from existing mining operations (approx. 64%). At the Suwannee River Mine, settling areas 7, 11, 12, and 13 will be used for new mining, and settling areas 3 and 4 will be used for new mining at the Swift Creek Mine (Tables 2.2-4 and 2.2-5).

Mudball waste material will be used for capping waste clay settling areas at the Suwannee River Mine and for capping and dam stabilization at the Swift Creek Mine (Figures 2.2-5 and 2.2-6, Tables 2.2-4 and 2.2-5). A total of approximately 1864 acres of mudball fill will be utilized in existing and proposed settling areas. A 60-acre mudball cap will be utilized for dam stabilization at Swift Creek Mine settling area No. 4 (Area E, Table 2.2-5, Figure 2.2-6). Sand tailings will be used for backfill in mine cuts, capping of waste clay settling areas, and dam stabilization and construction (Tables 2.2-4 and 2.2-5, Figures 2.2-5 and 2.2-6). Approximately 1897 acres of mine cuts will be backfilled with sand tailings, and approximately 1642 acres of waste clay settling areas will be capped.

2.2.1.5 Reclamation Schedule for Alternative A: No Mining or Mine Support in Wetlands

Under this alternative, approximately 11,569 acres of land will be reclaimed at the Suwannee River Mine (Table 2.2-6, Figure 2.2-7), and approximately 6927 acres will be reclaimed at the Swift Creek Mine (Table 2.2-6, Figure 2.2-8). The majority of land to be reclaimed at the Suwannee River Mine (6022 acres or 52%) will be reclaimed by the elevated fill method; 450 acres or 4% will be tailings fill, with the remainder (5097 acres or 44%) in land and lakes (Table 2.2-6). At the Swift Creek Mine, elevated fill reclamation will occupy 3040 acres (44%), while land and lakes and tailings fill will account for 2440 acres (35%) and 1447 acres (21%), respectively.

Table 2.2-3. Characteristics of Waste Clay Disposal Areas at the Suwannee River and Swift Creek Mines for Alternative A: No Mining or Mine Support in Wetlands.

| ID No. ¹ | Area (acres) | \bar{x} Base Elev. (ft NGVD) | Inside Crest (ft NGVD) | Max. Fluid Elevation (ft NGVD) | Initial \bar{x} Height of Clays Above Grade (ft) |
|----------------------------|--------------|--------------------------------|------------------------|--------------------------------|--|
| <u>Suwannee River Mine</u> | | | | | |
| 1 | 100 | 127 | 147 | 142 | 15 |
| 2 | 74 | 129 | 147 | 142 | 13 |
| 3A | 80 | 131 | 147 | 142 | 11 |
| 3B | 74 | 131 | 147 | 142 | 11 |
| 4 | 732 | 130 | 157 | 152 | 22 |
| 5 | 133 | 128 | 147 | 142 | 14 |
| 6A | 167 | 128 | 147 | 142 | 14 |
| 6B | 250 | 124 | 147 | 142 | 18 |
| 7 ² | 550 | 131 | 145 | 140 | 9 |
| 8 | 786 | 127 | 147 | 142 | 15 |
| 9 | 429 | 131 | 157 | 152 | 21 |
| 10 | 466 | 134 | 157 | 152 | 18 |
| 11 | 640 | 122 | 145 | 140 | 18 |
| 12 | 920 | 133 | 157 | 152 | 19 |
| 13 ² | 621 | 133 | 157 | 152 | 19 |
| Subtotal/ \bar{x} | 6022 | 129 | 150 | 145 | 16 |
| <u>Swift Creek Mine</u> | | | | | |
| 1 | 520 | 133 | 157 | 152 | 19 |
| 2 | 510 | 130 | 157 | 152 | 22 |
| 3 ² | 900 | 134 | 157 | 152 | 18 |
| 4 ³ | 1200 | 133 | 157 | 152 | 19 |
| Subtotal/ \bar{x} | 3130 | 133 | 157 | 152 | 20 |
| Total/ \bar{x} | 9152 | 130 | 152 | 147 | 17 |

¹See Figures 2.2-3 and 2.2-4.

²Under construction.

³Proposed construction.

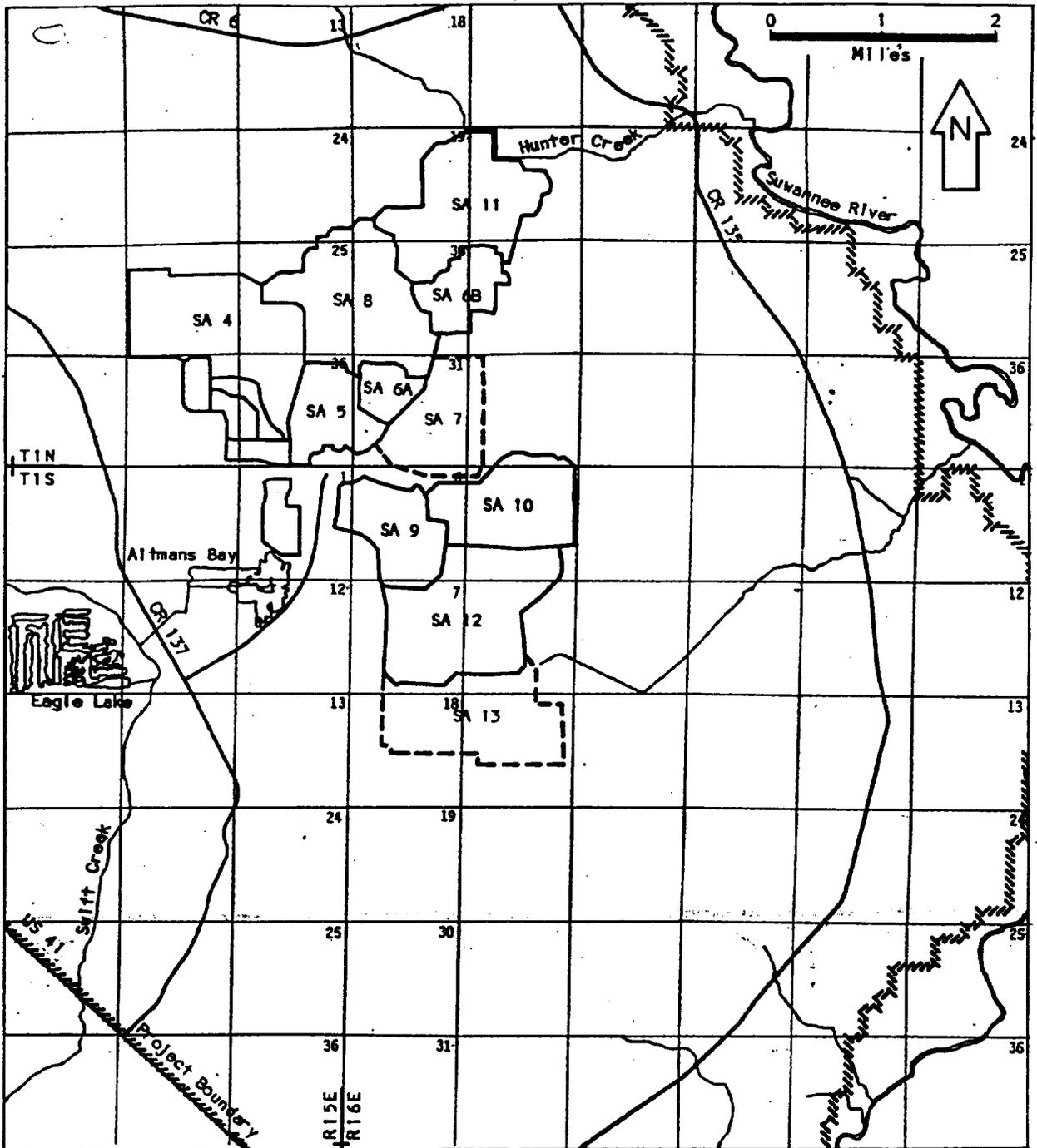


Figure 2.2-3.
 Waste Clay Disposal Areas for Suwannee River Mine,
 Alternative A: No Mining or Mine Support in Wetlands.

Settling Areas (SA)

- Existing
- - - Under construction

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-4. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Suwannee River Mine for Alternative A: No Mining or Mine Support in Wetlands.

| ID No. | Area (acres) | Useful Life ³ (years) |
|-------------------------------------|--------------|----------------------------------|
| <u>Waste Clay¹</u> | | |
| 7 | 550 | 3 |
| 11 | 640 | 6 |
| 12 | 920 | 4.5 |
| 13 | 621 | 3.5 |
| Total | 2731 | |
| <u>Mudball²</u> | | |
| A-1 | 173 | 1.5 |
| A-2 | 326 | 3 |
| A-3 | 365 | 3 |
| Total | 864 | |
| <u>Sand Tailings²</u> | | |
| I-a Tailings fill | 172 | 4 |
| SA 13 ¹ Dam construction | 0 | 2.5 |
| I-c Tailings fill | 278 | 1.5 |
| II Elevated fill | 305 | 1 |
| III Elevated fill | 312 | 1 |
| V-a Elevated fill | 200 | 0.5 |
| Total | 1267 | |

¹See Figure 2.2-3.

²See Figure 2.2-5.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

Table 2.2-5. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Swift Creek Mine for Alternative A: No Mining or Mine Support in Wetlands.

| ID No. | Area (acres) | Useful Life ³ (years) | |
|----------------------------------|-------------------|----------------------------------|----------|
| <u>Waste Clay¹</u> | | | |
| 3 | 900 | 4 | |
| 4 | 1200 | 6 | |
| Total | 2100 | | |
| <u>Mudball²</u> | | | |
| A | 295 | 2 | |
| B | 150 | 2 | |
| C | 100 | 1 | |
| D | 455 | 4 | |
| E | 60 | 1 | |
| Total | 1060 | | |
| <u>Sand Tailings²</u> | | | |
| 1 | Dam construction | 0 | 2 |
| 2 | Dam construction | 0 | 0.5 |
| 3 | Tailings fill | 171 | 0.5 |
| 4 | Tailings fill | 80 | 0.5 |
| 5 | Tailings fill | 59 | 3 months |
| 6 | Tailings fill | 116 | 0.5 |
| 7 | Tailings fill | 78 | 0.5 |
| 8 | Tailings fill | 77 | 3 months |
| 9 | Tailings fill | 62 | 3 months |
| 10 | Tailings fill | 60 | 0.5 |
| 11 | Tailings fill | 48 | 3 months |
| 12 | Tailings fill | 44 | 3 months |
| 13 | Tailings fill | 38 | 1 month |
| 14 | Tailings fill | 135 | 0.5 |
| 15 | Tailings fill | 201 | 1 |
| 16 | Dam stabilization | 150 | 0.5 |
| 17 | Tailings fill | 84 | 0.5 |
| 18 | Tailings fill | 44 | 2 months |
| 19 | Tailings fill | 63 | 3 months |
| 20 | Tailings fill | 87 | 0.5 |
| 21 | Tailings cap | 455 | 0.5 |
| 22 | Dam stabilization | 220 | 1 |
| Total | 1272 | | |

¹See Figure 2.2-4.

²See Figure 2.2-6.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

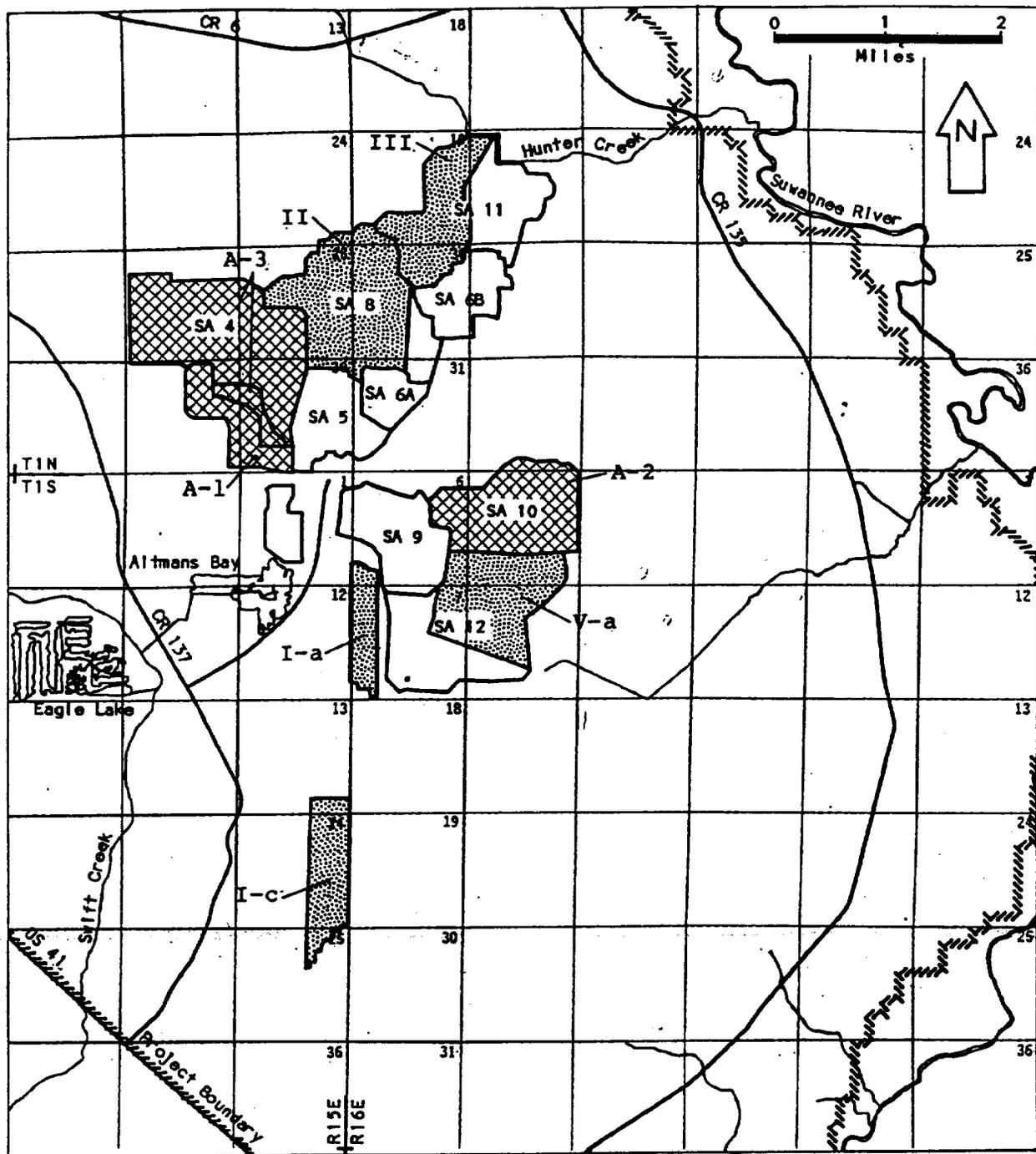


Figure 2.2-5.
 Mudball and Tailings Sand Disposal Areas for Suwannee
 River Mine, Alternative A: No Mining or Mine Support
 in Wetlands.

- Disposal Areas**
-  Tailings sand
 -  Mudball
 - SA** Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

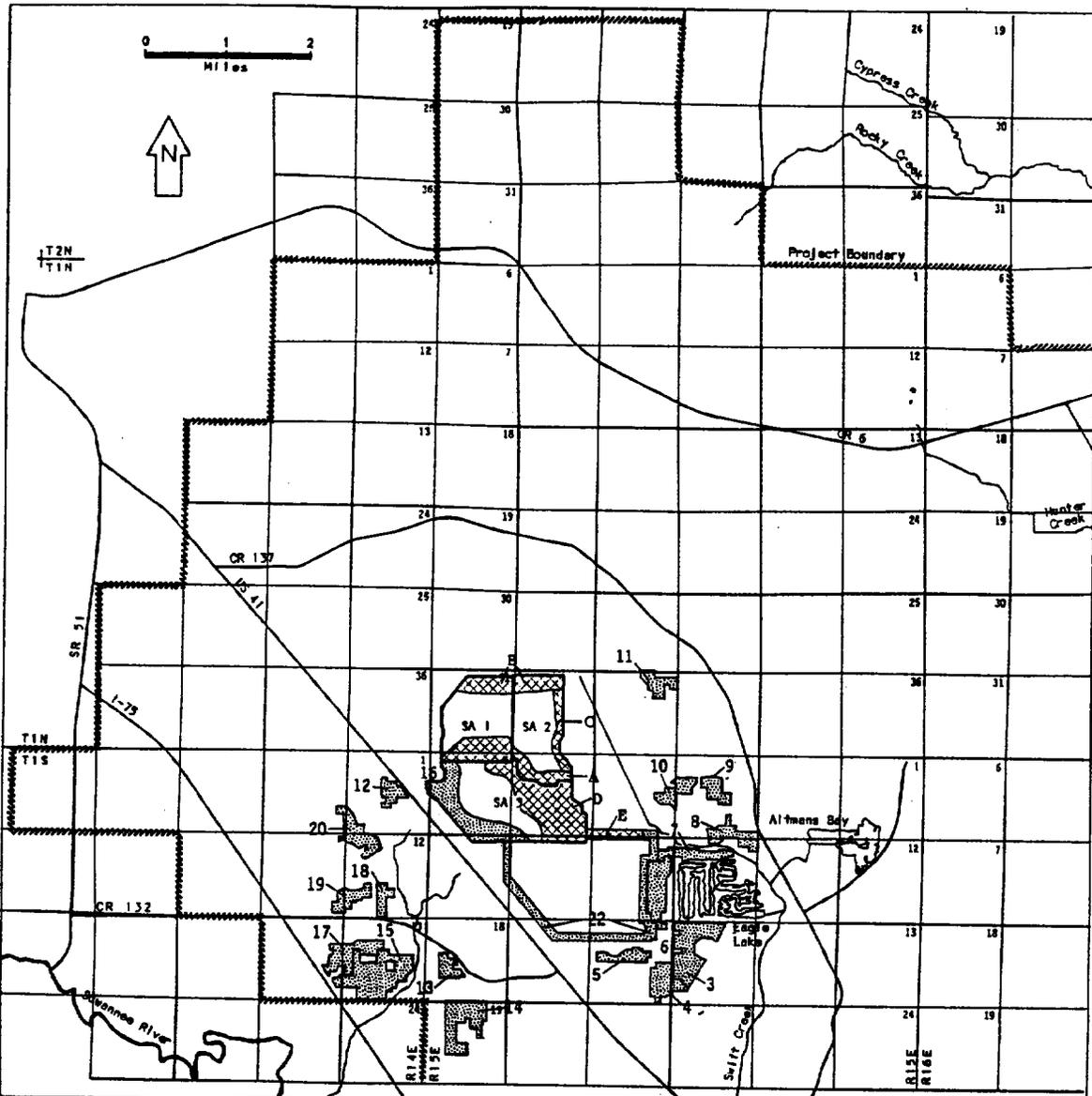


Figure 2.2-6.
Mudball and Tailings Sand Disposal Areas for Swift Creek Mine, Alternative A: No Mining or Mine Support in Wetlands.

Disposal Areas
 Tailings sand
 Mudball
 SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-6. Reclamation Schedule and Acreages for Alternative A: No Mining or Mine Support in Wetlands.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|----------------------------|-------|------------------------|----------------|---------------|---------------|
| <u>Suwannee River Mine</u> | | | | | |
| 1 | 587 | 110 | 110 | 0 | 0 |
| 2 | 568 | 435 | 435 | 0 | 0 |
| 3 | 542 | 214 | 214 | 0 | 0 |
| 4 | 577 | 629 | 529 | 0 | 100 |
| 5 | 654 | 796 | 568 | 0 | 228 |
| 6 | 519 | 542 | 542 | 0 | 0 |
| 7 | 521 | 577 | 577 | 0 | 0 |
| 8 | 428 | 1,292 | 654 | 172 | 466 |
| 9 | 0 | 797 | 519 | 278 | 0 |
| 10 | 0 | 957 | 521 | 0 | 436 |
| 11 | 0 | 5,220 | 428 | 0 | 4,792 |
| Subtotal | 4,396 | 11,569 | 5,097 | 450 | 6,022 |
| <u>Swift Creek Mine</u> | | | | | |
| 1 | 530 | 0 | 0 | 0 | 0 |
| 2 | 521 | 0 | 0 | 0 | 0 |
| 3 | 516 | 0 | 0 | 0 | 0 |
| 4 | 566 | 20 | 20 | 0 | 0 |
| 5 | 453 | 102 | 102 | 0 | 0 |
| 6 | 527 | 640 | 69 | 171 | 400 |
| 7 | 533 | 705 | 245 | 255 | 205 |
| 8 | 507 | 631 | 279 | 217 | 135 |
| 9 | 508 | 469 | 279 | 190 | 0 |
| 10 | 126 | 638 | 302 | 336 | 0 |
| 11 | 0 | 738 | 460 | 128 | 150 |
| 12 | 0 | 1,208 | 508 | 150 | 550 |
| 13 | 0 | 1,776 | 176 | 0 | 1,600 |
| Subtotal | 4,769 | 6,927 | 2,440 | 1,447 | 3,040 |
| Total | 9,165 | 18,496 | 7,537 | 1,897 | 9,062 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes 2804 acres reclaimed prior to January 1982.

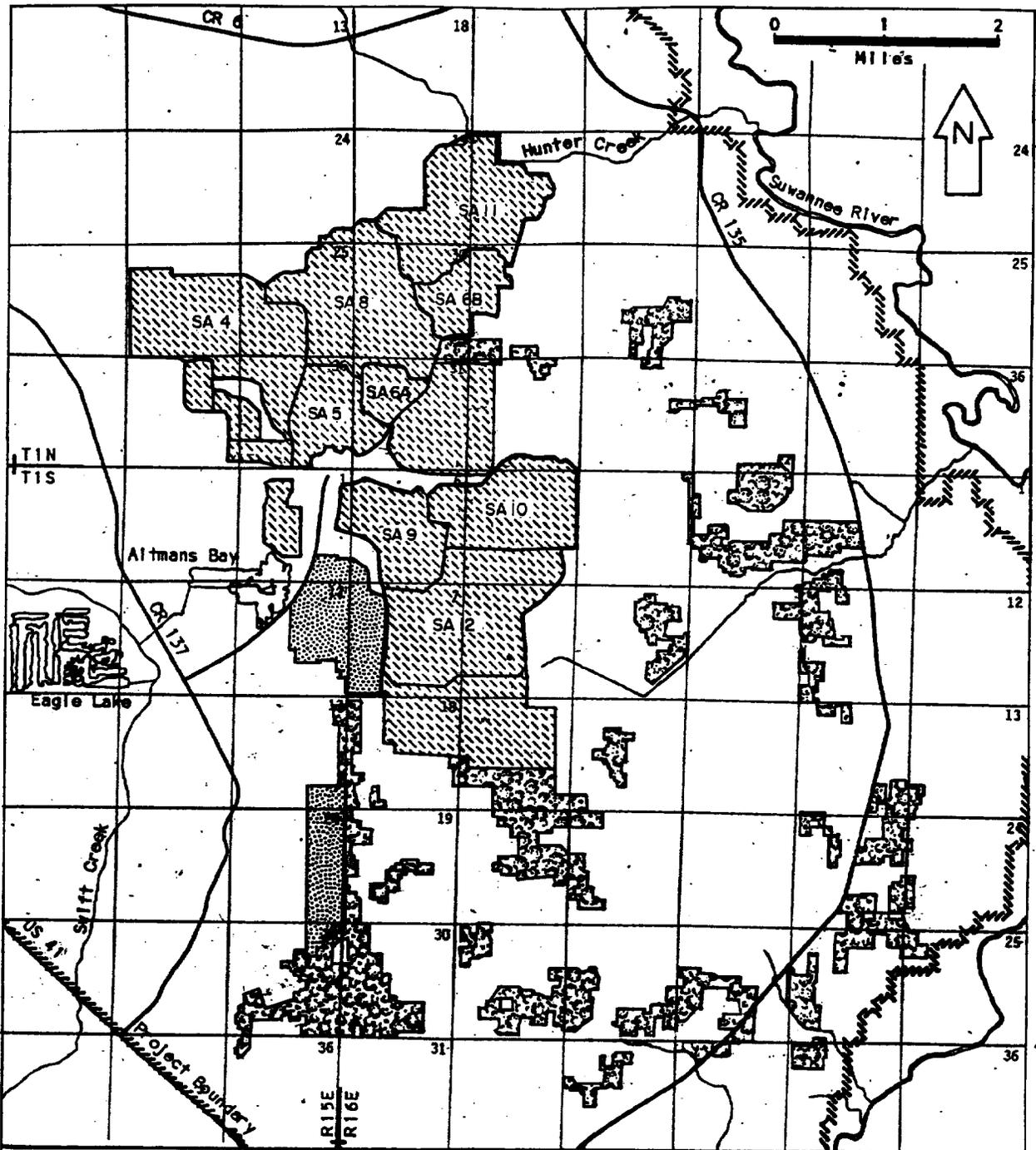


Figure 2.2-7.

Reclamation Plan for Suwannee River Mine, Alternative A: No Mining or Mine Support in Wetlands.

Note:

Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Only portions of streams not physically disturbed by mining or mine support activities are shown.

-  Tails fill
-  Land & lakes
-  Elevated fill
- SA Clay settling area

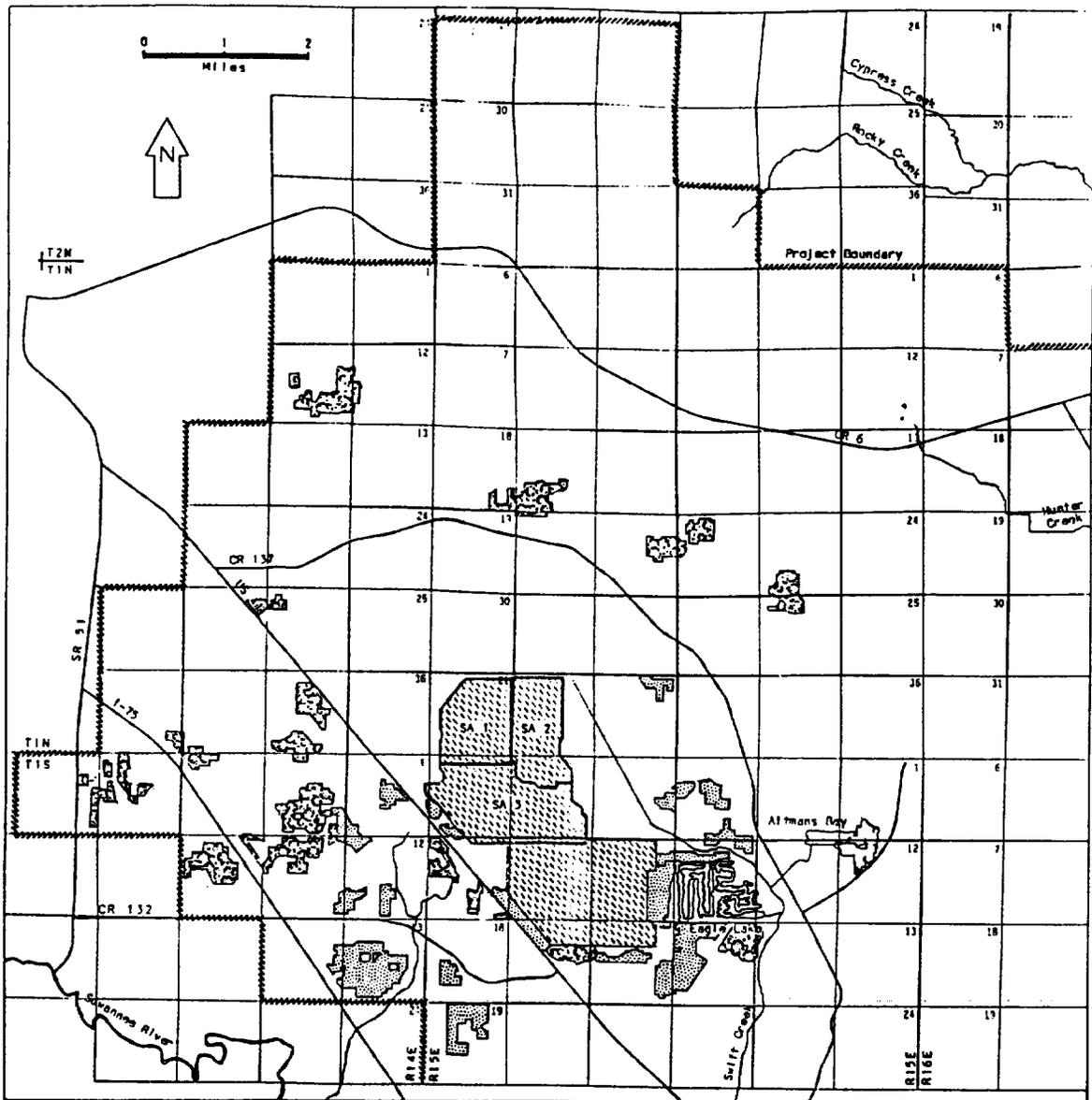


Figure 2.2-8.
Reclamation Plan for Swift Creek Mine, Alternative A:
No Mining or Mine Support in Wetlands.

Note: Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Method of Reclamation

-  Tails fill
-  Land & lakes
-  Elevated fill
- SA Clay settling area

2.2.2 Alternative B: Mining All Wetlands Containing Reserves

2.2.2.1 Alternative Description

This mining alternative assumes that all identified reserves will be mined, including those underlying wetlands and under FDER jurisdiction but excluding those lands needed for dam construction. The Suwannee River Mine will operate one 45 cu yd and two 30 cu yd draglines. The average annual production rate is estimated to be 2.1 million tons of concentrate for mining years 1-21. The Swift Creek Mine will operate two or three 45 cu yd draglines, and average annual production rate is estimated to be 2.2 million tons of concentrate for mining years 1-26. Other assumptions for this mining alternative include relocation of upper Swift Creek Canal and upper Camp Branch, and utilization of Swift Creek Swamp, north of Eagle Lake, for waste clay settling areas. Additionally, approximately 31,720 linear ft of tributary stream channel will be mined. This alternative provides maximum recovery of currently identified phosphate reserves.

2.2.2.2 Mining Schedule for Alternative B: Mining All Wetlands Containing Reserves

A total of approximately 25,899 acres are proposed for mining under this alternative (Table 2.2-7, Figures 2.2-9 and 2.2-10). An additional 4688 acres are proposed for waste clay settling areas but will not be mined. Yearly averages for mining will be 553 acres over a 20-year period (excluding the partial year 21) for the Suwannee River Mine and 579 acres over a 25-year period (excluding the partial year 26) for the Swift Creek Mine. Table 2.2-8 presents the various acreages by land use and cover type that will be mined and/or utilized for mine support facilities under this alternative.

2.2.2.3 Type, Composition, and Quantity of Materials to Be Excavated or Filled for Alternative B: Mining All Wetlands Containing Reserves

Based on data from exploratory borings and existing mining operations, the excavation quantities were computed to be as follows:

| <u>Material</u> | <u>Approx. Total Excavation for Mine Life (cu yd)</u> | <u>Average Yearly Excavation Rate (cu yd)</u> |
|---------------------|---|---|
| Suwannee River Mine | 712,857,000 | 34,971,300 |
| Swift Creek Mine | 793,507,000 | 31,328,600 |

2.2.2.4 Waste Disposal for Alternative B: Mining All Wetlands Containing Reserves

A total of approximately 18,202 acres of waste clay disposal areas will be utilized for both the Suwannee River and Swift Creek mines (Table 2.2-9). This includes existing waste clay disposal areas (totaling 5881 acres) as well as those currently under construction (2071 acres) and

Table 2.2-7. Mining Schedule and Acreages for Suwannee River and Swift Creek Mines for Alternative B: Mining All Wetlands Containing Reserves.

| Year | Suwannee River Mine | Swift Creek Mine | Year Total | Cumulative Total |
|--------------|---------------------|------------------|---------------|------------------|
| 1 | 587 | 530 | 1,117 | 1,117 |
| 2 | 568 | 521 | 1,089 | 2,206 |
| 3 | 517 | 481 | 998 | 3,204 |
| 4 | 586 | 742 | 1,328 | 4,532 |
| 5 | 603 | 662 | 1,265 | 5,797 |
| 6 | 550 | 681 | 1,231 | 7,028 |
| 7 | 592 | 706 | 1,298 | 8,326 |
| 8 | 604 | 685 | 1,289 | 9,615 |
| 9 | 606 | 659 | 1,265 | 10,880 |
| 10 | 587 | 595 | 1,182 | 12,062 |
| 11 | 502 | 684 | 1,186 | 13,248 |
| 12 | 580 | 830 | 1,410 | 14,658 |
| 13 | 574 | 666 | 1,240 | 15,898 |
| 14 | 587 | 521 | 1,108 | 17,006 |
| 15 | 531 | 497 | 1,028 | 18,034 |
| 16 | 511 | 544 | 1,055 | 19,089 |
| 17 | 470 | 508 | 978 | 20,067 |
| 18 | 499 | 545 | 1,044 | 21,111 |
| 19 | 492 | 524 | 1,016 | 22,127 |
| 20 | 520 | 504 | 1,024 | 23,151 |
| 21 | 228 | 523 | 751 | 23,902 |
| 22 | 0 | 417 | 417 | 24,319 |
| 23 | 0 | 455 | 455 | 24,774 |
| 24 | 0 | 515 | 515 | 25,289 |
| 25 | 0 | 469 | 469 | 25,758 |
| 26 | 0 | 141 | 141 | 25,899 |
| Total | 11,294 | 14,605 | 25,899 | 25,899 |

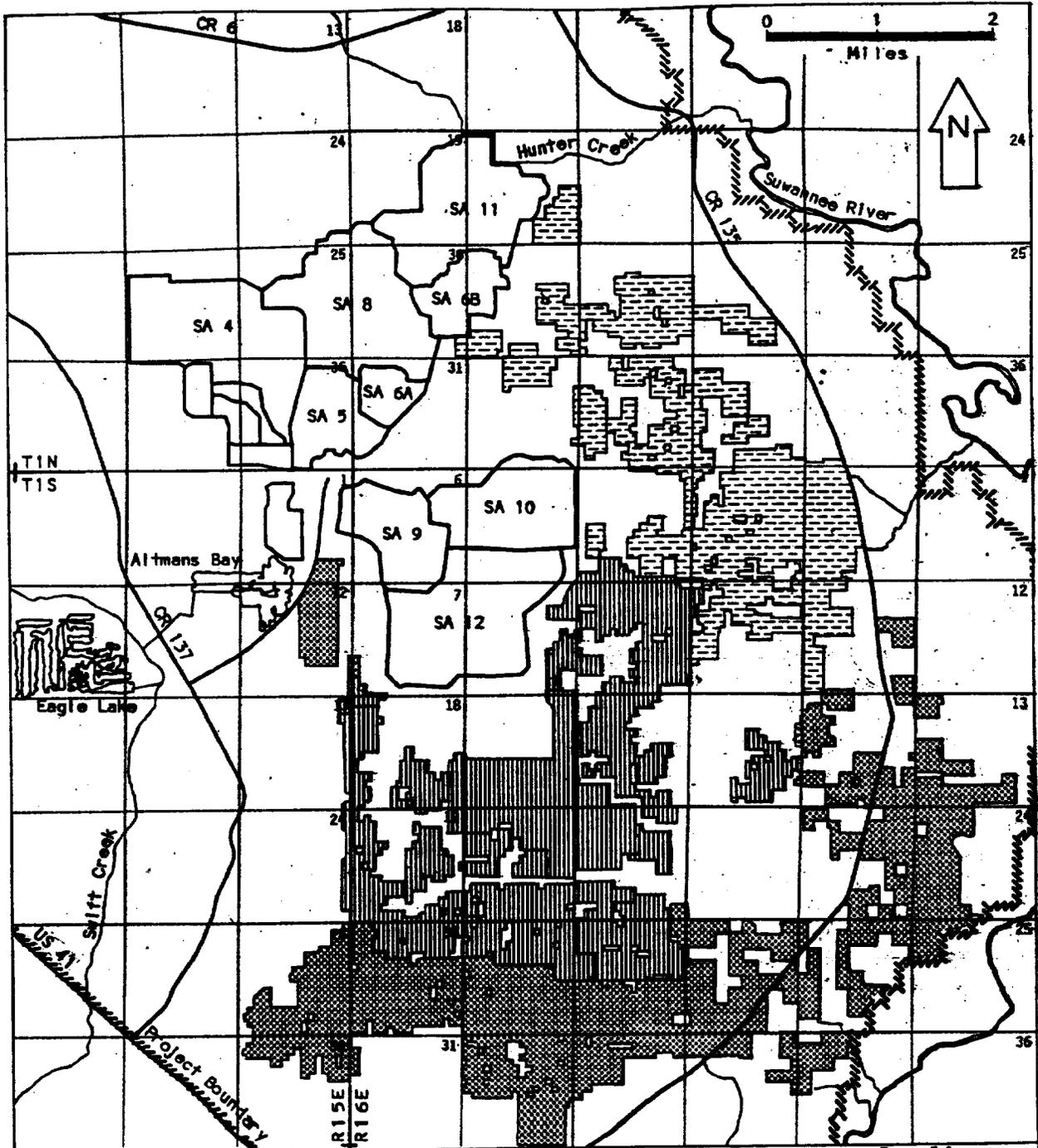


Figure 2.2-9.
 Mining Areas for Suwannee River Mine, Alternative B:
 Mining All Wetlands Containing Reserves.

- Dragline**
-  Number 1
 -  Number 2
 -  Number 3

SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

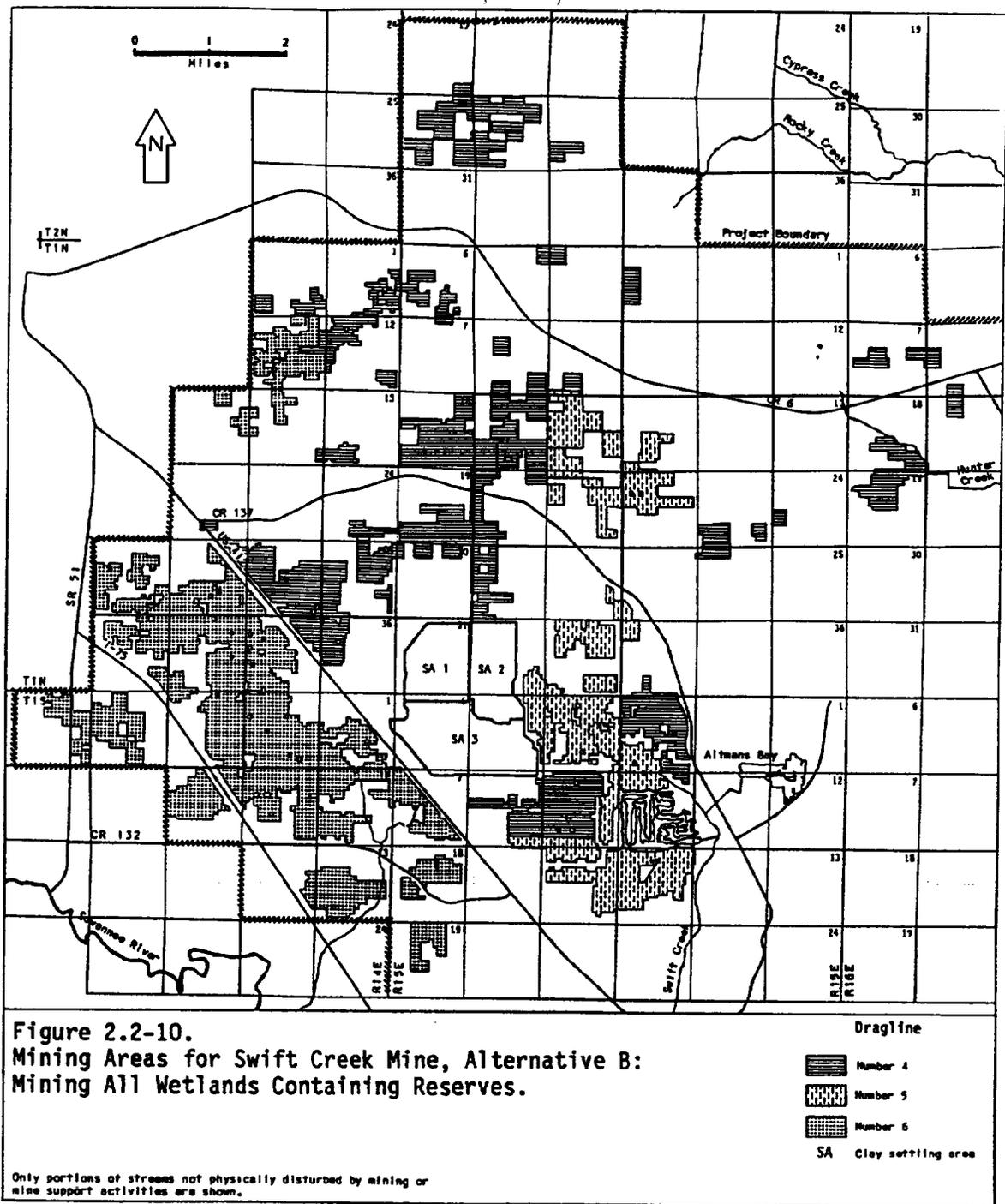


Table 2.2-8. Acreages of Land Use and Cover Types to Be Mined for Alternative B: Mining All Wetlands Containing Reserves.

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|---------------------------|--|--|---------------------------------|---|---------------------------------|
| DEVELOPED AREA | | | | | |
| 111 | Residential, single unit, low density | 53 | <0.1 | 2 | 3.8 |
| 112 | Residential, single unit, medium density | 5 | <0.1 | 5 | 100.0 |
| 114 | Mobile homes, medium density | 18 | <0.1 | 0 | 0 |
| 123 | Offices and professional services | 20 | <0.1 | 0 | 0 |
| 131 | Light industrial | 13 | <0.1 | 1 | 7.7 |
| 144 | Major roads, highways, and railroads | 524 | 0.5 | 62 | 11.8 |
| 152 | Major long distance transmission lines | 27 | <0.1 | 10 | 37.0 |
| 162 | Religious facilities, excluding schools | 3 | <0.1 | 0 | 0 |
| 167 | Cemeteries | 4 | <0.1 | 0 | 0 |
| 193 | Land undergoing active development | 21 | <0.1 | 15 | 71.4 |
| | Subtotal | 688 | 0.7 | 95 | 13.8 |
| UPLAND COMMUNITIES | | | | | |
| 211 | Row crops | 3,976 | 4.0 | 419 | 10.5 |
| 212 | Field crops | 2,509 | 2.5 | 623 | 24.8 |
| 213 | Improved pasture | 1,302 | 1.3 | 41 | 3.2 |
| 222 | Deciduous fruit orchard | 1 | <0.1 | 0 | 0 |
| 231 | Pecan orchard | 1 | <0.1 | 0 | 0 |
| 242 | Confined feeding operations | 51 | <0.1 | 8 | 15.7 |
| 323 | Scrub/brush rangeland | 105 | 0.1 | 83 | 79.1 |
| 411 | Pine flatwoods | 3,935 | 3.9 | 1,790 | 45.5 |
| 422 | Other hardwoods | 87 | <0.1 | 35 | 40.2 |
| 431 | Mixed forest | 12,399 | 12.4 | 2,868 | 23.1 |
| 441 | Planted coniferous forest | 24,861 | 24.8 | 8,247 | 33.2 |
| 451 | Clearcut areas | 9,195 | 9.2 | 4,705 | 51.2 |
| 741 | Scraped areas | 8 | <0.1 | 5 | 62.5 |
| 742 | Dredge and fill areas | 382 | 0.4 | 258 | 67.5 |
| 760 | Mining and processing | 15,379 | 15.4 | 2,079 | 13.5 |
| | Subtotal | 74,191 | 74.0 | 21,161 | 28.5 |

Table 2.2-8 (Continued).

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|----------------------------|------------------------------|--|---------------------------------|---|---------------------------------|
| WETLAND COMMUNITIES | | | | | |
| 6110 | Cypress | 1,970 | 2.0 | 492 | 25.0 |
| 6211 | Swamp tupelo | 775 | 0.8 | 251 | 32.4 |
| 6212 | Bayhead | 1,322 | 1.3 | 376 | 28.4 |
| 6213 | Scrub/shrub | 1,314 | 1.3 | 231 | 17.6 |
| 6311 | Cypress/swamp tupelo/bay | 12,633 | 12.6 | 4,511 | 35.7 |
| 6312 | Swamp tupelo/bay/pine | 6,291 | 6.3 | 3,292 | 52.3 |
| 6410 | Emergent | 430 | 0.4 | 111 | 25.8 |
| | Subtotal | 24,735 | 24.7 | 9,264 | 37.4 |
| AQUATIC COMMUNITIES | | | | | |
| 513 | Canals | 66 | <0.1 | 43 | 65.2 |
| 521 | Mine pits reclaimed to lakes | 17 | <0.1 | 15 | 88.2 |
| 531 | Reservoirs | 434 | 0.4 | 0 | 0 |
| 561 | Ponds | 73 | <0.1 | 9 | 12.3 |
| | Subtotal | 590 | 0.6 | 67 | 11.4 |
| Total | | 100,204 | 100 | 30,587 | 30.5 |

¹Based on Florida Land Use and Cover Classification System (Fla. Dept. of Administration 1976).

²All acreages, percentages, and totals have been rounded.

Table 2.2-9. Characteristics of Waste Clay Disposal Areas at the Suwannee River and Swift Creek Mines for Alternative B: Mining All Wetlands Containing Reserves.

| ID No. ¹ | Area (acres) | \bar{x} Base Elev. (ft NGVD) | Inside Crest (ft NGVD) | Max. Fluid Elev. (ft NGVD) | \bar{x} Initial Height of Clays Above Grade (ft) |
|----------------------------|--------------|--------------------------------|------------------------|----------------------------|--|
| <u>Suwannee River Mine</u> | | | | | |
| 1 | 100 | 127 | 147 | 142 | 15 |
| 2 | 74 | 129 | 147 | 142 | 13 |
| 3A | 80 | 131 | 147 | 142 | 11 |
| 3B | 74 | 131 | 147 | 142 | 11 |
| 4 | 732 | 130 | 157 | 152 | 22 |
| 5 | 133 | 128 | 147 | 142 | 14 |
| 6A | 167 | 128 | 147 | 142 | 14 |
| 6B | 250 | 124 | 147 | 142 | 18 |
| 7 ² | 550 | 131 | 145 | 140 | 9 |
| 8 | 786 | 127 | 147 | 142 | 15 |
| 9 | 429 | 131 | 157 | 152 | 21 |
| 10 | 466 | 134 | 157 | 152 | 18 |
| 11 | 640 | 122 | 145 | 140 | 18 |
| 12 | 920 | 133 | 157 | 152 | 19 |
| 13 ² | 621 | 133 | 157 | 152 | 19 |
| 14 ³ | 1,650 | 135 | 157 | 152 | 17 |
| 15 ³ | 280 | 125 | 145 | 140 | 15 |
| 16 ³ | 865 | 129 | 145 | 140 | 11 |
| 17 ³ | 690 | 130 | 145 | 140 | 10 |
| 18 ³ | 1,575 | 131 | 145 | 140 | 9 |
| Subtotal/ \bar{x} | 11,082 | 129 | 149 | 144 | 15 |
| <u>Swift Creek Mine</u> | | | | | |
| 1 | 520 | 133 | 157 | 152 | 19 |
| 2 | 510 | 130 | 157 | 152 | 22 |
| 3 ² | 900 | 134 | 157 | 152 | 18 |
| 4 ³ | 1,200 | 133 | 157 | 152 | 19 |
| 6 ³ | 710 | 125 | 157 | 152 | 27 |
| 7 ³ | 1,000 | 124 | 157 | 152 | 28 |
| 8 ³ | 900 | 124 | 157 | 152 | 28 |
| 9 ³ | 780 | 125 | 157 | 152 | 27 |
| 10 ³ | 600 | 124 | 157 | 152 | 28 |
| Subtotal/ \bar{x} | 7,120 | 128 | 157 | 152 | 24 |
| Total/ \bar{x} | 18,202 | 129 | 152 | 147 | 18 |

¹See Figures 2.2-11 and 2.2-12.

²Under construction.

³Proposed construction.

those proposed for construction (10,250 acres) under this mining alternative (Figures 2.2-11 and 2.2-12). At the Suwannee River Mine, waste clay settling areas 7 and 11 through 18 will be used primarily for new mining, and waste clay settling areas 3, 4, 6, 7, 8, 9, and 10 will be used for new mining at the Swift Creek Mine (Tables 2.2-10 and 2.2-11).

Mudball waste disposal material will be used for capping material on approximately 6046 acres of waste clay settling areas (Tables 2.2-10 and 2.2-11, Figures 2.2-13 and 2.2-14).

Sand tailings will be used for backfill of mine cuts, dam stabilization and construction, and for capping waste clay settling areas (Tables 2.2-10 and 2.2-11, Figures 2.2-13 and 2.2-14). Sand tailings used as backfill for mine cuts will account for approximately 6366 acres, and approximately 5171 acres of sand tailings are proposed for elevated fill (Tables 2.2-10 and 2.2-11).

2.2.2.5 Reclamation Schedule for Alternative B: Mining All Wetlands Containing Reserves

Three reclamation types are anticipated under the reclamation program: land and lakes, tailings fill, and elevated fill. A total of approximately 38,851 acres will be reclaimed (Tables 2.2-12 and 2.2-13, Figures 2.2-15 and 2.2-16). This includes lands that have been mined previously as well as lands proposed for mining under this alternative. Approximately 14,373 acres (37%) of the reclaimed land will be in land and lakes, of which 50% will be wetland areas and open water. Tailings fill and elevated fill will occupy approximately 6366 acres (16%) and approximately 18,112 acres (47%), respectively.

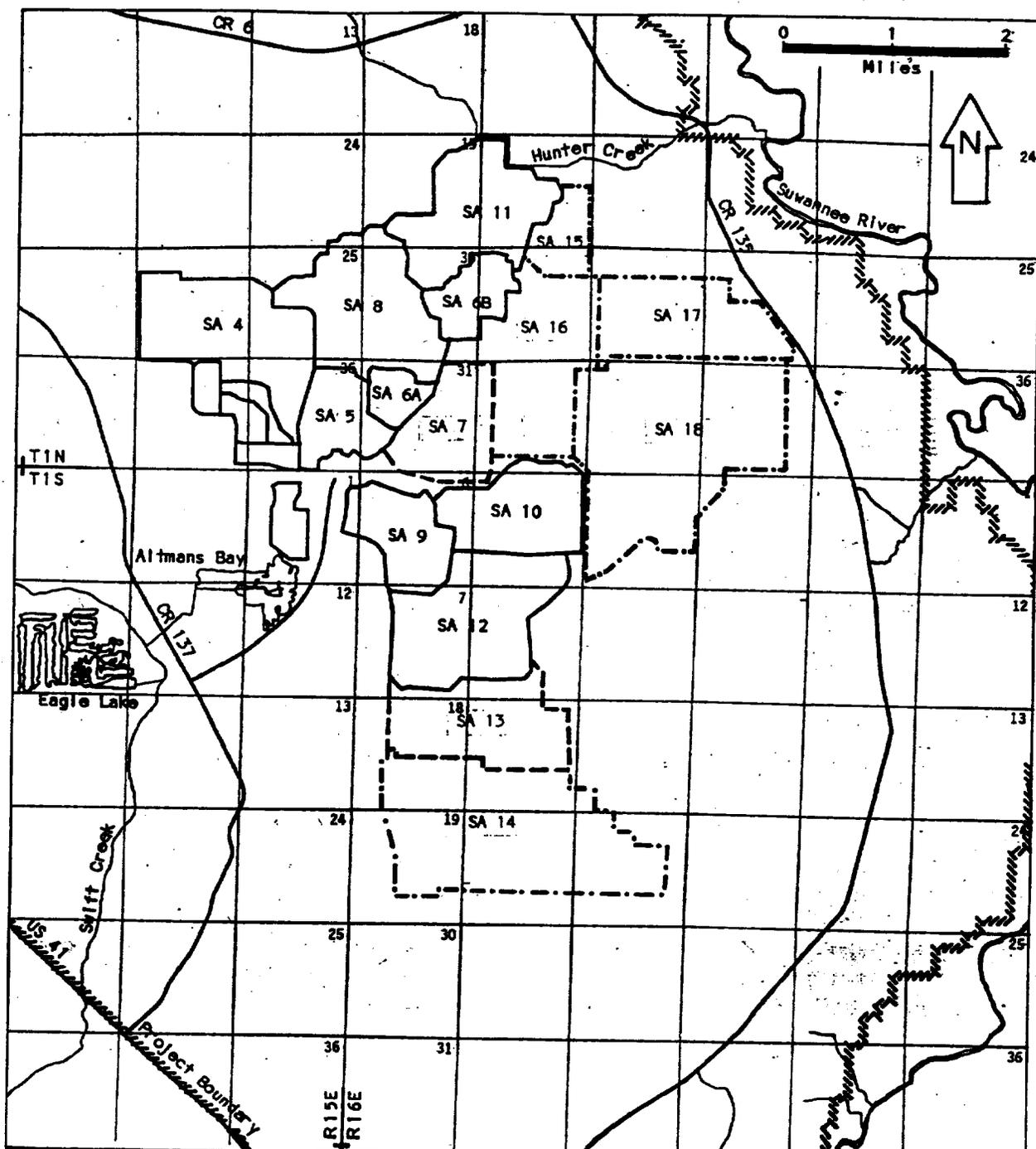


Figure 2.2-11.
 Waste Clay Disposal Areas for Suwannee River Mine,
 Alternative B: Mining All Wetlands Containing Reserves.

- Settling Areas (SA)**
- Existing
 - - - Under construction
 - · - · - Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

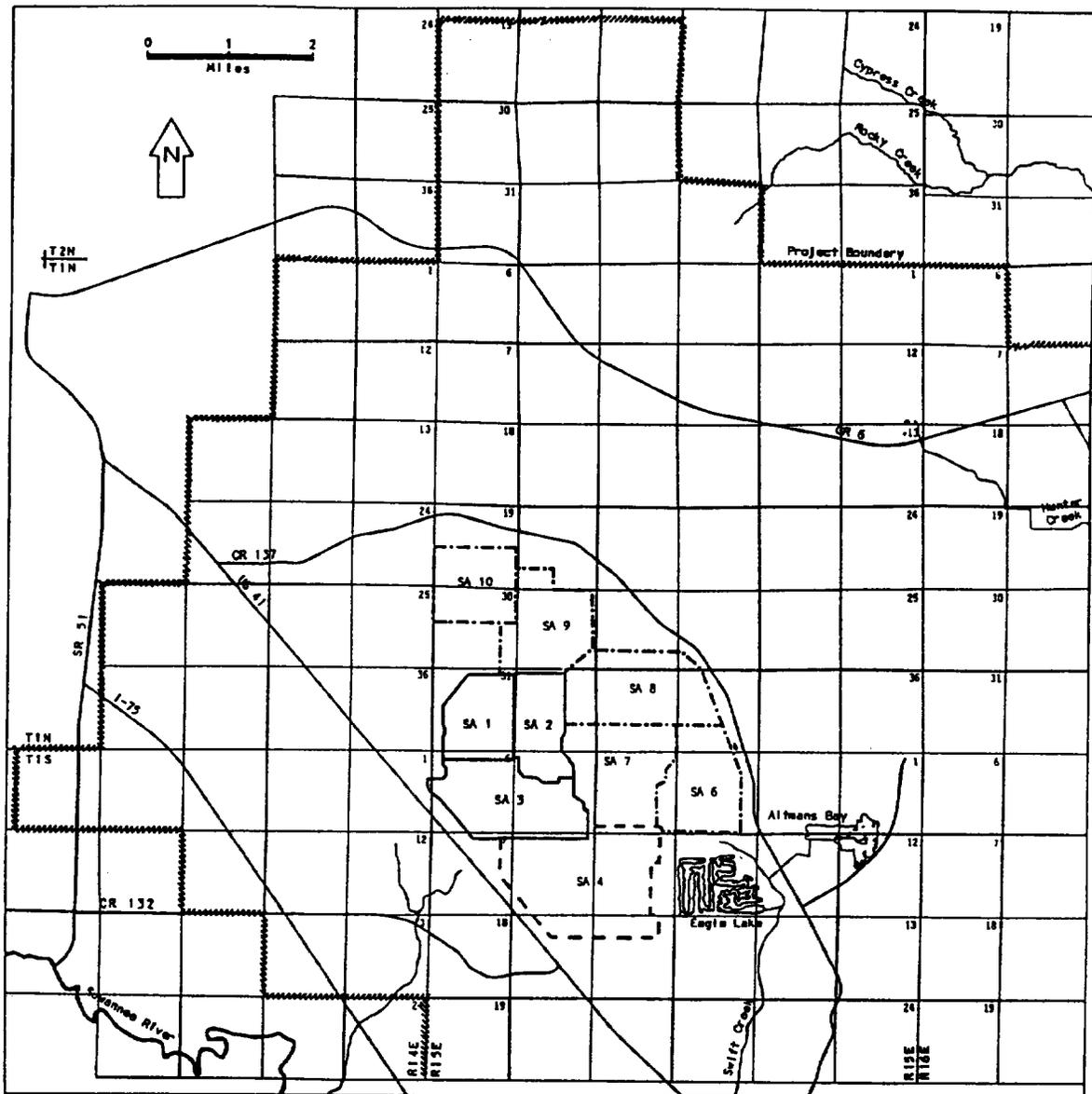


Figure 2.2-12.
 Waste Clay Disposal Areas for Swift Creek Mine,
 Alternative B: Mining All Wetlands Containing Reserves.

Settling Areas (SA)

- Existing
- - - Under construction
- Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-10. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Suwannee River Mine for Alternative B: Mining All Wetlands Containing Reserves.

| ID No. | Area (acres) | Useful Life ³ (years) | |
|----------------------------------|------------------|----------------------------------|-----|
| <u>Waste Clay¹</u> | | | |
| 7 | 550 | 2 | |
| 11 | 640 | 6 | |
| 12 | 920 | 3.5 | |
| 13 | 621 | 5 | |
| 14 | 1650 | 12.5 | |
| 15 | 280 | 1.5 | |
| 16 | 865 | 4 | |
| 17 | 690 | 3 | |
| 18 | 1575 | 4.5 | |
| Total | 7791 | | |
| <u>Mudball²</u> | | | |
| A-1 | 173 | 2 | |
| A-2 | 326 | 3.5 | |
| A-3 | 512 | 5 | |
| C | 346 | 3.5 | |
| D | 257 | 3 | |
| E | 225 | 2.5 | |
| F | 107 | 1.5 | |
| Total | 1946 | | |
| <u>Sand Tailings²</u> | | | |
| I-a | Tailings fill | 414 | 4 |
| SA 13 ¹ | Dam construction | 0 | 3 |
| I-c | Tailings fill | 265 | 1 |
| I-b | Tailings fill | 421 | 1.5 |
| II | Elevated fill | 305 | 1 |
| III | Elevated fill | 312 | 1 |
| V-a | Elevated fill | 400 | 1 |
| V-b | Tailings fill | 910 | 4.5 |
| VI | Elevated fill | 206 | 1 |
| VII | Elevated fill | 196 | 0.5 |
| VIII-a | Elevated fill | 350 | 1 |
| VIII-b | Elevated fill | 729 | 2 |
| IX | Elevated fill | 273 | 1 |
| Total | | 4781 | |

¹See Figure 2.2-11.

²See Figure 2.2-13.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

Table 2.2-11. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Swift Creek Mine for Alternative B: Mining All Wetlands Containing Reserves.

| ID No. | Area (acres) | Useful Life ³ (years) |
|-------------------------------|--------------|----------------------------------|
| Waste Clay¹ | | |
| 3 | 900 | 3 |
| 4 | 1200 | 4.5 |
| 6 | 710 | 3 |
| 7 | 1000 | 4.5 |
| 8 | 900 | 4.5 |
| 9 | 780 | 4 |
| 10 | 600 | 4 |
| Total | 6090 | |
| Mudball² | | |
| A | 295 | 2 |
| B | 275 | 3.5 |
| C | 270 | 0.5 |
| D | 350 | 3 |
| E | 250 | 2 |
| F | 150 | 1 |
| G | 600 | 1 |
| H | 200 | 0.5 |
| I | 300 | 3 |
| J | 400 | 5 |
| K | 300 | 0.5 |
| L | 450 | 1 |
| M | 150 | 0.5 |
| N | 110 | 2 |
| Total | 4100 | |

Table 2.2-11 (Continued).

| ID No. | Area (acres) | Useful Life ³ (years) |
|----------------------------------|-----------------|-------------------------------------|
| <u>Sand Tailings²</u> | | |
| 1 Dam construction | 0 | 2 |
| 2 Dam construction | 0 | 0.5 |
| 3 Elevated fill | 270 | 0.5 |
| 4 Tailings fill | 171 | 0.5 |
| 5 Dam stabilization | 0 | 0.5 |
| 6 Tailings fill | 141 | 0.5 |
| 7 Dam construction | 0 | 1 |
| 8 Tailings fill | 272 | 0.5 |
| 9 Tailings fill | 35 | 2 months |
| 10 Tailings fill | 202 | 0.5 |
| 11 Tailings fill | 235 | 1 |
| 12 Tailings fill | 311 | 0.5 |
| 13 Tailings fill | 240 | 1 |
| 14 Tailings fill | 220 | 0.5 |
| 15 Tailings fill | 176 | 0.5 |
| 16 Elevated fill | 600 | 1 |
| 17 Tailings fill | 242 | 0.5 |
| 18 Elevated fill | 200 | 0.5 |
| 19 Tailings fill | 290 | 1 |
| 20 Tailings fill | 314 | 1 |
| 21 Tailings fill | 278 | 1 |
| 22 Tailings fill | 181 | 1 |
| 23 Tailings fill | 168 | 1 |
| 24 Tailings fill | 238 | 1 |
| 25 Elevated fill | 300 | 1 |
| 26 Elevated fill | 450 | 1 |
| 27 Elevated fill | 150 | 0.5 |
| 28 Tailings fill | 182 | 1 |
| 29 Tailings fill | 230 | 1.5 |
| 30 Tailings fill | 230 | 1 |
| 31 Elevated fill | 430 | 2 |
| Total | 6756 | |

¹See Figure 2.2-12.

²See Figure 2.2-14.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

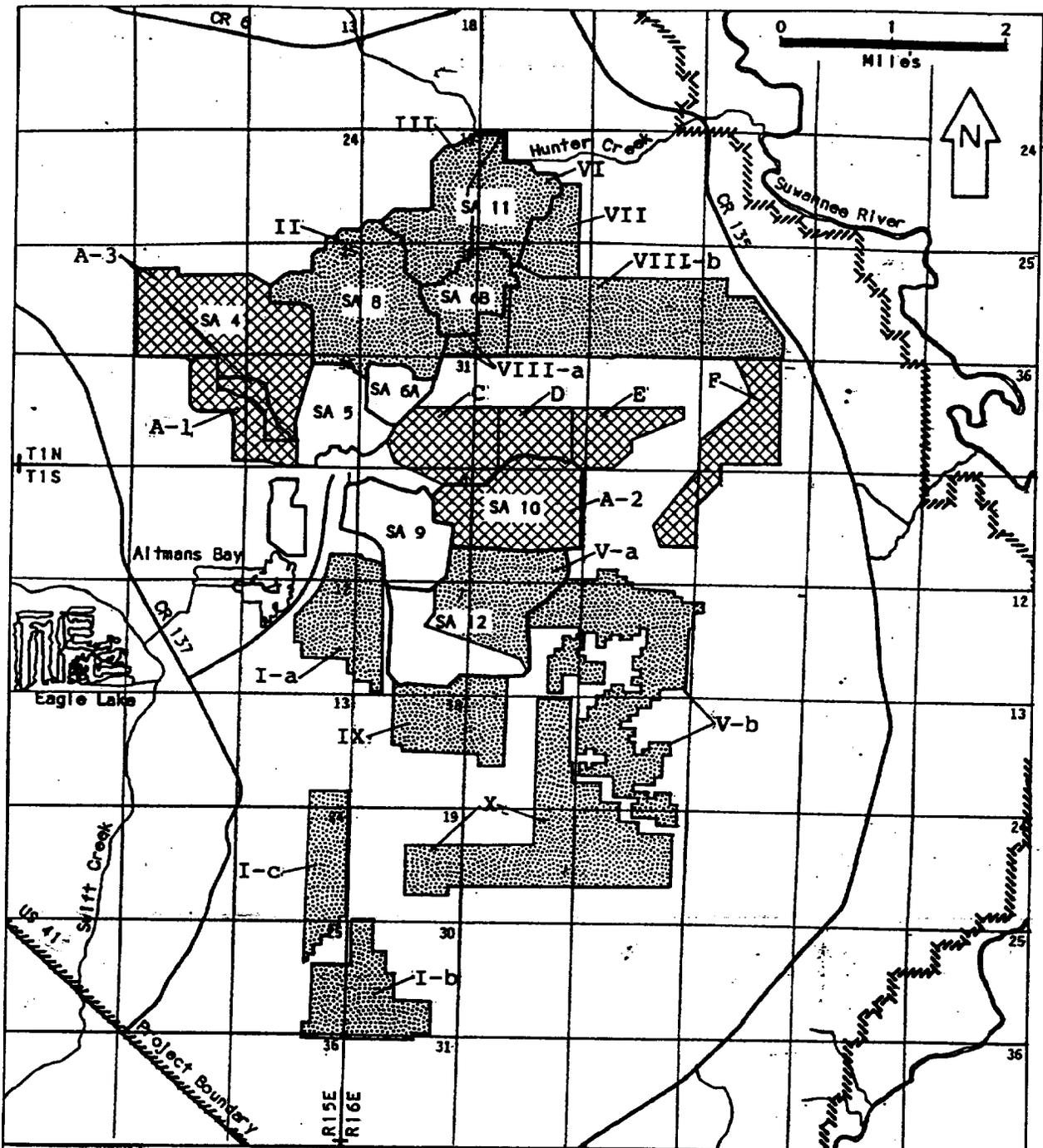


Figure 2.2-13.
 Mudball and Tailings Sand Disposal Areas for Suwannee River Mine, Alternative B: Mining All Wetlands Containing Reserves.

Disposal Areas

| | |
|---|--------------------|
|  | Tailings sand |
|  | Mudball |
| SA | Clay settling area |

Only portions of streams not physically disturbed by mining or mine support activities are shown.

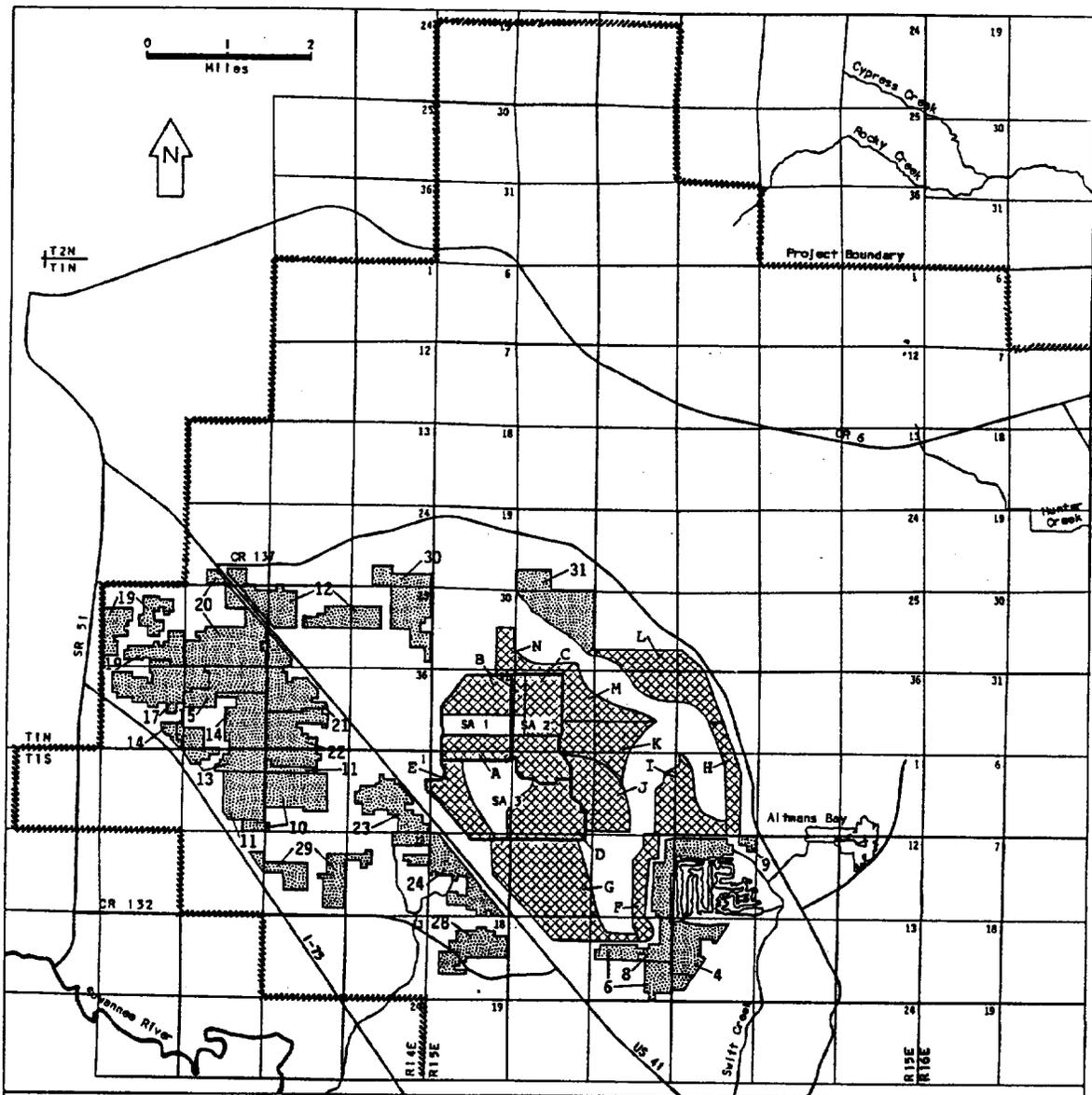


Figure 2.2-14.
 Mudball and Tailings Sand Disposal Areas for Swift Creek
 Mine, Alternative B: Mining All Wetlands Containing
 Reserves.

Disposal Areas

-  Tailings sand
-  Mudball
- SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-12. Reclamation Schedule and Acreages for the Suwannee River Mine for Alternative B: Mining All Wetlands Containing Reserves.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|--------------|---------------|------------------------|----------------|---------------|---------------|
| 1 | 587 | 110 | 110 | 0 | 0 |
| 2 | 568 | 275 | 275 | 0 | 0 |
| 3 | 517 | 24 | 24 | 0 | 0 |
| 4 | 586 | 205 | 105 | 0 | 100 |
| 5 | 603 | 355 | 127 | 0 | 228 |
| 6 | 550 | 313 | 313 | 0 | 0 |
| 7 | 592 | 441 | 441 | 0 | 0 |
| 8 | 604 | 753 | 400 | 353 | 0 |
| 9 | 606 | 1,094 | 350 | 278 | 466 |
| 10 | 587 | 319 | 319 | 0 | 0 |
| 11 | 502 | 817 | 396 | 421 | 0 |
| 12 | 580 | 748 | 312 | 0 | 436 |
| 13 | 574 | 670 | 224 | 0 | 446 |
| 14 | 587 | 1,470 | 167 | 0 | 1,303 |
| 15 | 531 | 367 | 225 | 142 | 0 |
| 16 | 511 | 655 | 257 | 398 | 0 |
| 17 | 470 | 639 | 422 | 217 | 0 |
| 18 | 499 | 914 | 367 | 201 | 346 |
| 19 | 492 | 645 | 351 | 0 | 294 |
| 20 | 520 | 726 | 446 | 0 | 280 |
| 21 | 228 | 1,256 | 499 | 0 | 757 |
| 22 | 0 | 492 | 492 | 0 | 0 |
| 23 | 0 | 1,560 | 520 | 0 | 1,040 |
| 24 | 0 | 5,614 | 228 | 0 | 5,386 |
| Total | 11,294 | 20,462 | 7,370 | 2,010 | 11,082 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).

Table 2.2-13. Reclamation Schedule and Acreages for the Swift Creek Mine for Alternative B: Mining All Wetlands Containing Reserves.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|-------|--------|------------------------|----------------|---------------|---------------|
| 1 | 530 | 0 | 0 | 0 | 0 |
| 2 | 521 | 0 | 0 | 0 | 0 |
| 3 | 481 | 0 | 0 | 0 | 0 |
| 4 | 742 | 20 | 20 | 0 | 0 |
| 5 | 662 | 102 | 102 | 0 | 0 |
| 6 | 681 | 111 | 111 | 0 | 0 |
| 7 | 706 | 434 | 263 | 171 | 0 |
| 8 | 685 | 240 | 240 | 0 | 0 |
| 9 | 659 | 416 | 0 | 141 | 275 |
| 10 | 595 | 186 | 16 | 0 | 170 |
| 11 | 684 | 579 | 70 | 509 | 0 |
| 12 | 830 | 900 | 315 | 235 | 350 |
| 13 | 666 | 1,030 | 419 | 311 | 300 |
| 14 | 521 | 1,145 | 435 | 460 | 250 |
| 15 | 497 | 697 | 521 | 176 | 0 |
| 16 | 544 | 808 | 266 | 242 | 300 |
| 17 | 508 | 1,200 | 0 | 0 | 1,200 |
| 18 | 545 | 290 | 0 | 290 | 0 |
| 19 | 524 | 538 | 224 | 314 | 0 |
| 20 | 504 | 1,002 | 314 | 278 | 410 |
| 21 | 523 | 718 | 369 | 349 | 0 |
| 22 | 417 | 524 | 524 | 0 | 0 |
| 23 | 455 | 742 | 504 | 238 | 0 |
| 24 | 515 | 293 | 293 | 0 | 0 |
| 25 | 469 | 967 | 417 | 0 | 550 |
| 26 | 141 | 1,317 | 455 | 412 | 450 |
| 27 | 0 | 1,645 | 515 | 230 | 900 |
| 28 | 0 | 469 | 469 | 0 | 0 |
| 29 | 0 | 2,016 | 141 | 0 | 1,875 |
| Total | 14,605 | 18,389 | 7,003 | 4,356 | 7,030 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).

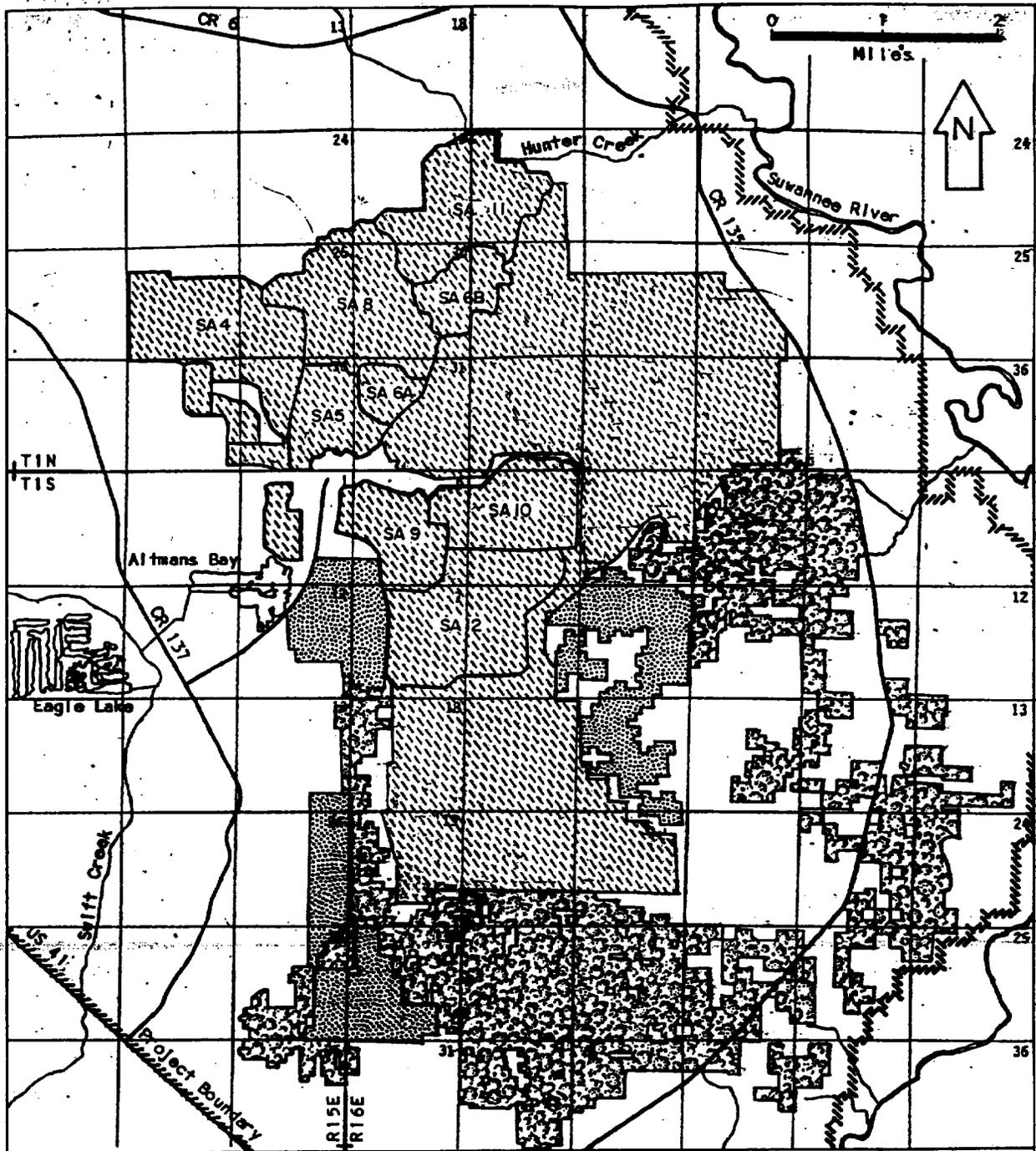


Figure 2.2-15.
Reclamation Plan for Suwannee River Mine, Alternative B:
Mining All Wetlands Containing Reserves.

Note:
 Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 37B, FS, and Chapter 16C-17, FAC.

-  Tails fill
-  Land & lakes
-  Elevated fill
- SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

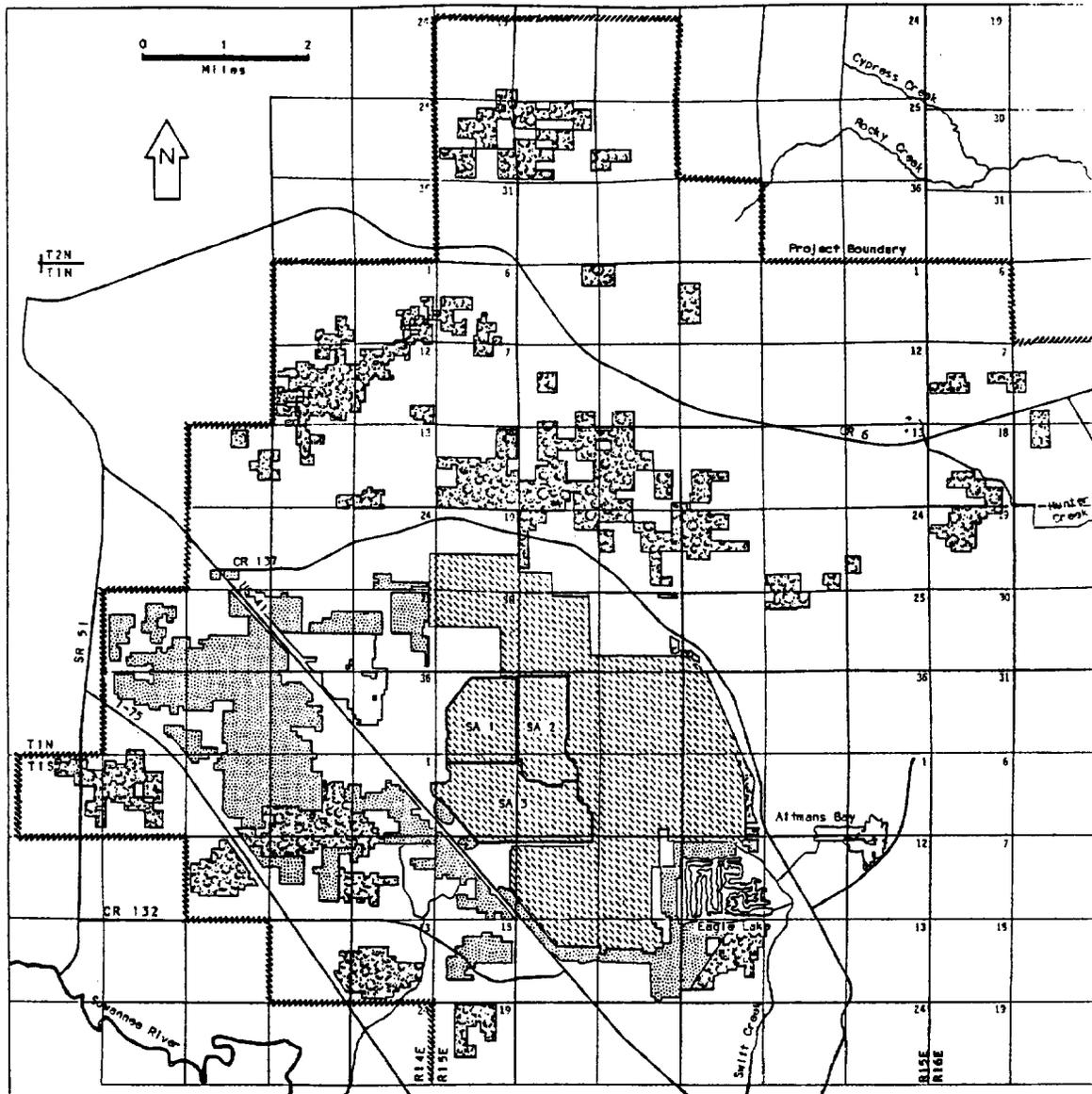
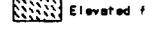


Figure 2.2-16.
Reclamation Plan for Swift Creek Mine, Alternative B:
Mining All Wetlands Containing Reserves.

Note: Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Method of Reclamation

-  Tails fill
-  Land & lakes
-  Elevated fill
- SA** Clay settling area

2.2.3 Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves

2.2.3.1 Alternative Description

This mining alternative assumes that upland areas containing reserves and wetlands <25 acres in size containing identified reserves not under FDER jurisdiction will be mined. The Suwannee River Mine will operate one 45 cu yd and two 30 cu yd draglines. The average annual production rate for the Suwannee River Mine is estimated to be 2.3 million tons of concentrate for mining years 1-14. The Swift Creek Mine will operate two 45 cu yd draglines, with an average annual production of 1.9 million tons of concentrate for mining years 1-18. This mining alternative will result in the extraction and processing of approximately 62% of the reserves on the Suwannee River Mine and approximately 56% of the reserves on the Swift Creek Mine and will shorten the planned mine life by 7 years (33%) and 8 years (31%), respectively. The remaining reserves lie under wetlands >25 acres and/or are in areas covered by FDER jurisdiction or areas made unmineable by having to avoid activities within the jurisdictional areas.

2.2.3.2 Mining Schedule for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves

Approximately 16,746 acres are proposed for mining under this alternative (Table 2.2-14, Figures 2.2-17 and 2.2-18). An additional 1880 acres will be utilized for waste disposal activities. The average yearly mining rates for the Suwannee River and Swift Creek mines will be 555 acres and 513 acres, respectively. Acreages of land use categories which will be mined and/or utilized for mine support activities are presented in Table 2.2-15.

2.2.3.3 Type, Composition, and Quantity of Materials to Be Excavated or Filled for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves

Based on data from exploratory borings and existing mining operations, the excavation quantities were computed to be as follows:

| <u>Material</u> | <u>Approx. Total Excavation for Mine Life (cu yd)</u> | <u>Average Yearly Excavation Rate (cu yd)</u> |
|---------------------|---|---|
| Suwannee River Mine | 477,815,000 | 35,150,307 |
| Swift Creek Mine | 503,354,000 | 28,073,824 |

2.2.3.4 Waste Disposal for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves

A total of approximately 12,352 acres of waste clay disposal areas will be utilized for both the Suwannee River and Swift Creek mines (Table 2.2-16).

Table 2.2-14. Mining Schedule and Acreages for Suwannee River and Swift Creek Mines for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| Year | Suwannee River Mine | Swift Creek Mine | Year Total | Cumulative Total |
|--------------|----------------------------|-------------------------|-------------------|-------------------------|
| 1 | 587 | 530 | 1,117 | 1,117 |
| 2 | 568 | 521 | 1,089 | 2,206 |
| 3 | 580 | 482 | 1,062 | 3,268 |
| 4 | 562 | 629 | 1,191 | 4,459 |
| 5 | 531 | 538 | 1,069 | 5,528 |
| 6 | 572 | 425 | 997 | 6,525 |
| 7 | 587 | 425 | 1,012 | 7,537 |
| 8 | 503 | 456 | 959 | 8,496 |
| 9 | 525 | 465 | 990 | 9,486 |
| 10 | 582 | 522 | 1,104 | 10,590 |
| 11 | 505 | 514 | 1,019 | 11,609 |
| 12 | 589 | 526 | 1,115 | 12,724 |
| 13 | 525 | 553 | 1,078 | 13,802 |
| 14 | 302 | 531 | 833 | 14,635 |
| 15 | 0 | 563 | 563 | 15,198 |
| 16 | 0 | 483 | 483 | 15,681 |
| 17 | 0 | 558 | 558 | 16,239 |
| 18 | 0 | 507 | 507 | 16,746 |
| Total | 7,518 | 9,228 | 16,746 | 16,746 |

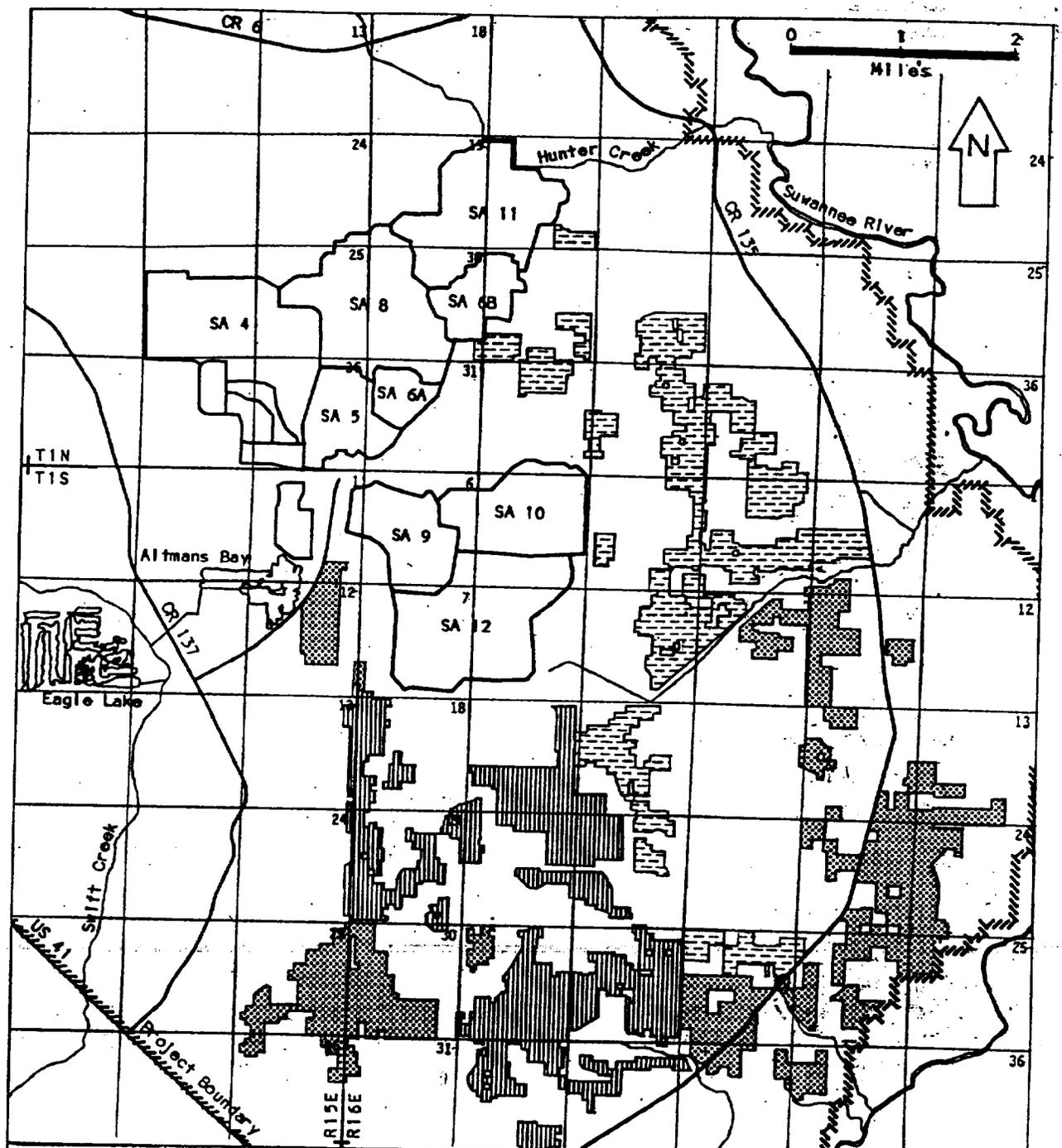


Figure 2.2-17.
 Mining Areas for Suwannee River Mine, Alternative C:
 Mining Only Small Isolated or Weakly/Periodically
 Connected Wetlands Containing Reserves.

Dragline

-  Number 1
-  Number 2
-  Number 3

SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

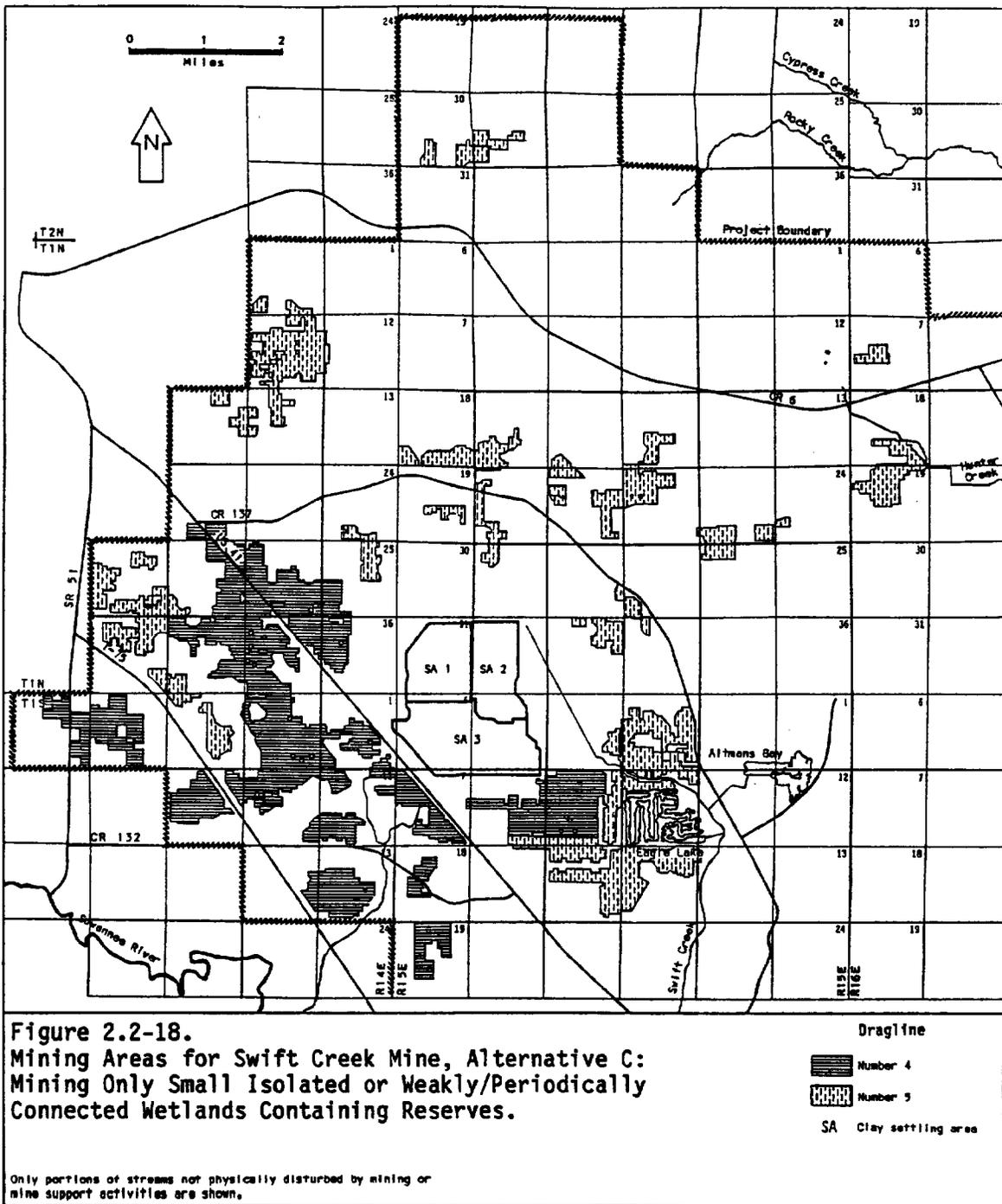


Table 2.2-15. Acreages of Land Use and Cover Types to Be Mined for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| Code ¹ | Description | Approx. Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|---------------------------|--|---------------------------------|---------------------------------|---|---------------------------------|
| DEVELOPED AREA | | | | | |
| 111 | Residential, single unit, low density | 53 | <0.1 | 3 | 5.7 |
| 112 | Residential, single unit, medium density | 5 | <0.1 | 5 | 100.0 |
| 114 | Mobile homes, medium density | 18 | <0.1 | 0 | 0 |
| 123 | Offices and professional services | 20 | <0.1 | 0 | 0 |
| 131 | Light industrial | 13 | <0.1 | 0 | 0 |
| 144 | Major roads, highways, and railroads | 524 | 0.5 | 0 | 0 |
| 152 | Major long distance transmission lines | 27 | <0.1 | 0 | 0 |
| 162 | Religious facilities, excluding schools | 3 | <0.1 | 0 | 0 |
| 167 | Cemeteries | 4 | <0.1 | 0 | 0 |
| 193 | Land undergoing active development | 21 | <0.1 | 20 | 95.2 |
| | Subtotal | 688 | 0.7 | 28 | 4.1 |
| UPLAND COMMUNITIES | | | | | |
| 211 | Row crops | 3,976 | 4.0 | 377 | 9.5 |
| 212 | Field crops | 2,509 | 2.5 | 580 | 23.1 |
| 213 | Improved pasture | 1,302 | 1.3 | 27 | 2.1 |
| 222 | Deciduous fruit orchard | 1 | <0.1 | 0 | 0 |
| 231 | Pecan orchard | 1 | <0.1 | 0 | 0 |
| 242 | Confined feeding operations | 51 | <0.1 | 8 | 15.7 |
| 323 | Scrub/brush rangeland | 105 | 0.1 | 0 | 0 |
| 411 | Pine flatwoods | 3,935 | 3.9 | 871 | 22.1 |
| 422 | Other hardwoods | 87 | <0.1 | 17 | 19.5 |
| 431 | Mixed forest | 12,399 | 12.4 | 1,845 | 14.9 |
| 441 | Planted coniferous forest | 24,861 | 24.8 | 7,439 | 29.9 |
| 451 | Clearcut areas | 9,195 | 9.2 | 3,602 | 39.2 |
| 741 | Scraped areas | 8 | <0.1 | 5 | 62.5 |
| 742 | Dredge and fill areas | 382 | 0.4 | 124 | 32.5 |
| 760 | Mining and processing | 15,379 | 15.4 | 1,233 | 8.0 |
| | Subtotal | 74,191 | 74.0 | 16,128 | 21.7 |

Table 2.2-15 (Continued).

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|----------------------------|------------------------------|--|---------------------------------|---|---------------------------------|
| WETLAND COMMUNITIES | | | | | |
| 6110 | Cypress | 1,970 | 2.0 | 183 | 9.3 |
| 6211 | Swamp tupelo | 775 | 0.8 | 64 | 8.3 |
| 6212 | Bayhead | 1,322 | 1.3 | 0 | 0 |
| 6213 | Scrub/shrub | 1,314 | 1.3 | 12 | 0.9 |
| 6311 | Cypress/swamp tupelo/bay | 12,633 | 12.6 | 1,830 | 14.5 |
| 6312 | Swamp tupelo/bay/pine | 6,291 | 6.3 | 338 | 5.4 |
| 6410 | Emergent | 430 | 0.4 | 25 | 5.8 |
| | Subtotal | 24,735 | 24.7 | 2,452 | 9.9 |
| AQUATIC COMMUNITIES | | | | | |
| 513 | Canals | 66 | <0.1 | 0 | 0 |
| 521 | Mine pits reclaimed to lakes | 17 | <0.1 | 0 | 0 |
| 531 | Reservoirs | 434 | 0.4 | 10 | 2.3 |
| 561 | Ponds | 73 | <0.1 | 8 | 11.0 |
| | Subtotal | 590 | 0.6 | 18 | 3.1 |
| Total | | 100,204 | 100 | 18,626 | 18.6 |

¹Based on Florida Land Use and Cover Classification System (Fla. Dept. of Administration 1976).

²All acreages, percentages, and totals have been rounded.

Table 2.2-16. Characteristics of Waste Clay Disposal Areas at the Suwannee River and Swift Creek Mines for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| ID No. ¹ | Area (acres) | \bar{x} Base Elev. (ft NGVD) | Inside Crest (ft NGVD) | Max. Fluid Elev. (ft NGVD) | Initial \bar{x} Height of Clays Above Grade (ft) |
|----------------------------|--------------|--------------------------------|------------------------|----------------------------|--|
| <u>Suwannee River Mine</u> | | | | | |
| 1 | 100 | 127 | 147 | 142 | 15 |
| 2 | 74 | 129 | 147 | 142 | 11 |
| 3A | 80 | 131 | 147 | 142 | 11 |
| 3B | 74 | 131 | 147 | 142 | 11 |
| 4 | 732 | 130 | 157 | 152 | 22 |
| 5 | 133 | 128 | 147 | 142 | 14 |
| 6A | 167 | 128 | 147 | 142 | 14 |
| 6B | 250 | 124 | 147 | 142 | 18 |
| 7 ² | 550 | 131 | 145 | 140 | 9 |
| 8 | 786 | 127 | 147 | 142 | 15 |
| 9 | 429 | 131 | 157 | 152 | 21 |
| 10 | 466 | 134 | 157 | 152 | 18 |
| 11 | 640 | 122 | 145 | 140 | 18 |
| 12 | 920 | 133 | 157 | 152 | 19 |
| 13 ² | 621 | 133 | 157 | 152 | 19 |
| 14 ³ | 550 | 134 | 157 | 152 | 18 |
| 15 ³ | 880 | 128 | 145 | 140 | 12 |
| Subtotal/ \bar{x} | 7,452 | 129 | 150 | 145 | 16 |
| <u>Swift Creek Mine</u> | | | | | |
| 1 | 520 | 133 | 157 | 152 | 19 |
| 2 | 510 | 130 | 157 | 152 | 22 |
| 3 ² | 900 | 134 | 157 | 152 | 18 |
| 4 ³ | 1,200 | 133 | 157 | 152 | 19 |
| 5 ³ | 760 | 141 | 172 | 167 | 26 |
| 6 ³ | 515 | 135 | 171 | 166 | 31 |
| 7 ³ | 495 | 146 | 171 | 166 | 20 |
| Subtotal/ \bar{x} | 4,900 | 136 | 163 | 158 | 22 |
| Total/ \bar{x} | 12,352 | 131 | 154 | 149 | 18 |

¹See Figures 2.2-19 and 2.2-20.

²Under construction.

³Proposed construction.

This includes existing clay disposal areas (5881 acres or 48%) as well as those currently under construction for existing operations (2071 acres or 17%) and proposed for construction (4400 acres or 36%) under this mining alternative (Figures 2.2-19 and 2.2-20). At the Suwannee River Mine, clay settling areas 7 and 11 through 15 will be used primarily for new mining, and settling areas 3 through 7 at the Swift Creek Mine will be used for new mining (Tables 2.2-17 and 2.2-18).

Mudball disposal material will be used as mudball caps on approximately 3407 acres of clay settling areas (Tables 2.2-17 and 2.2-18, Figures 2.2-21 and 2.2-22). Sand tailings material will be used for backfill of mine cuts (3582 acres), capping waste clay settling areas (2189 acres), and dam stabilization (420 acres) (Tables 2.2-17 and 2.2-18, Figures 2.2-21 and 2.2-22).

2.2.3.5 Reclamation Schedule for Alternative C: Mining Only
Small Isolated or Weakly/Periodically Connected Wetlands
Containing Reserves

A total of approximately 26,890 acres will be reclaimed into either land and lakes, tailings fill, or elevated fill (Tables 2.2-19 and 2.2-20, Figures 2.2-23 and 2.2-24). The reclamation total includes previously mined lands as well as lands proposed for mining under this alternative. Approximately 11,046 acres (41%) will be in the land and lakes type, approximately 3582 acres (13%) in tailings fill, and approximately 12,262 acres (46%) in elevated fill.

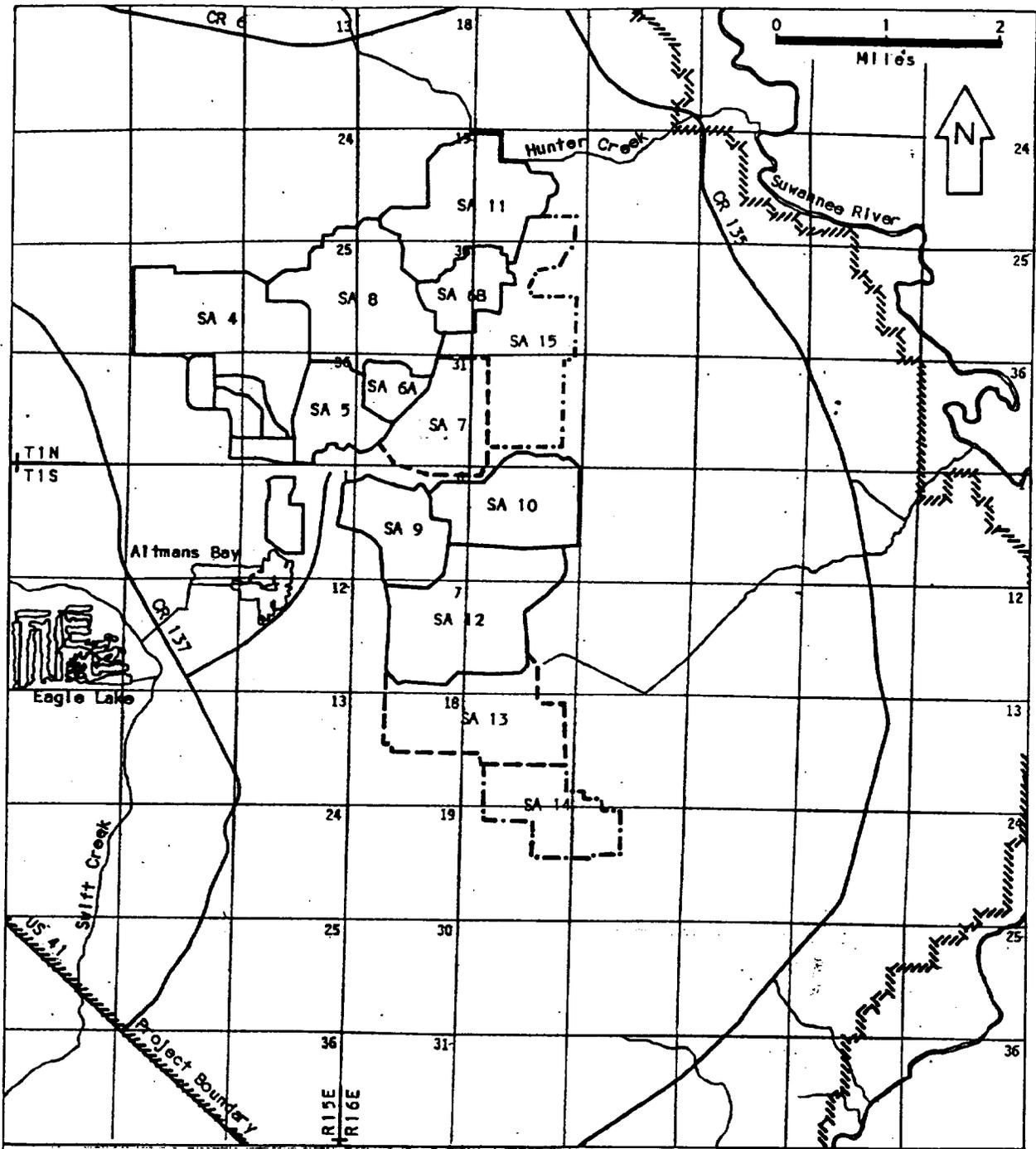


Figure 2.2-19.
 Waste Clay Disposal Areas for Suwannee River Mine,
 Alternative C: Mining Only Small Isolated or Weakly/
 Periodically Connected Wetlands Containing Reserves.

- Settling Areas (SA)
- Existing
 - - - Under construction
 - · - Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

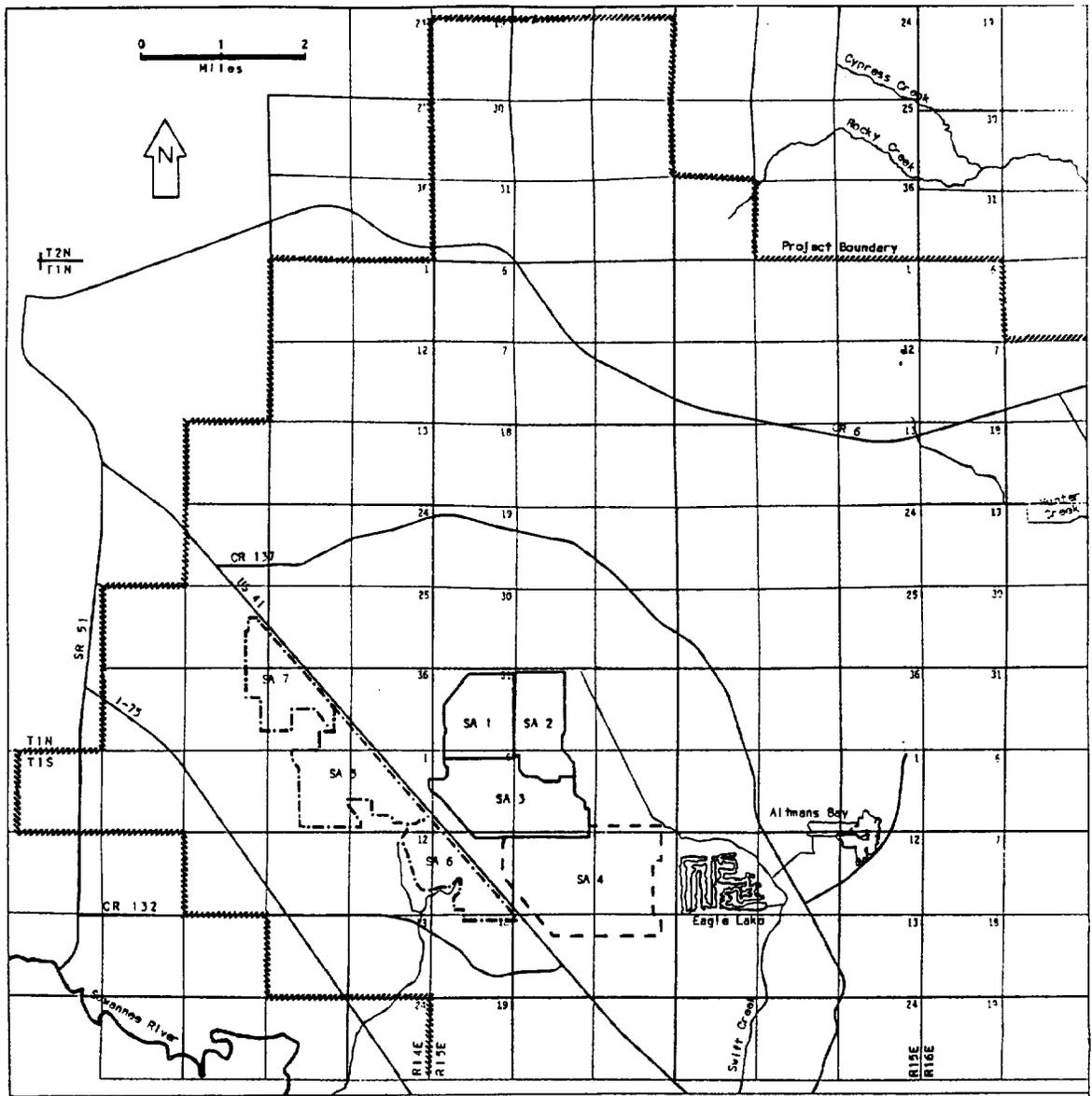


Figure 2.2-20.
 Waste Clay Disposal Areas for Swift Creek Mine,
 Alternative C: Mining Only Small Isolated or Weakly/
 Periodically Connected Wetlands Containing Reserves.

Settling Areas (SA)

- Existing
- - - Under construction
- · · Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-17. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Suwannee River Mine for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| ID No. | | Area (acres) | Useful Life ³ (years) |
|----------------------------------|------------------|-----------------|-------------------------------------|
| <u>Waste Clay¹</u> | | | |
| 7 | | 550 | 3 |
| 11 | | 640 | 7 |
| 12 | | 920 | 4 |
| 13 | | 621 | 6.5 |
| 14 | | 550 | 3.5 |
| 15 | | 880 | 5 |
| Total | | 4161 | |
| <u>Mudball²</u> | | | |
| A1 | | 173 | 2 |
| A2 | | 326 | 3.5 |
| A3 | | 512 | 6 |
| C | | 276 | 2 |
| Total | | 1287 | |
| <u>Sand Tailings²</u> | | | |
| I-a | Tailings fill | 390 | 5 |
| SA 13 ¹ | Dam construction | 0 | 2.5 |
| I-c | Tailings fill | 265 | 1.5 |
| I-b | Tailings fill | 397 | 2 |
| II | Elevated fill | 305 | 1 |
| III | Elevated fill | 312 | 1 |
| V | Elevated fill | 400 | 1 |
| VI | Elevated fill | 223 | 1 |
| IX | Elevated fill | 273 | 0.5 |
| X | Elevated fill | 376 | 1 |
| Total | | 2941 | |

¹See Figure 2.2-19.

²See Figure 2.2-21.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

Table 2.2-18. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Swift Creek Mine for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| ID No. | Area (acres) | Useful Life ³ (years) |
|-------------------------------|-----------------|-------------------------------------|
| <u>Waste Clay¹</u> | | |
| 3 | 900 | 4 |
| 4 | 1200 | 6.5 |
| 5 | 760 | 3.5 |
| 6 | 515 | 3.5 |
| 7 | 495 | 2 |
| Total | 3870 | |
| <u>Mudball²</u> | | |
| A | 295 | 2 |
| B | 180 | 2 |
| C | 135 | 1.5 |
| D | 350 | 1 |
| E | 210 | 2 |
| F | 350 | 4 |
| G | 350 | 1 |
| H | 250 | 0.5 |
| Total | 2120 | |

Table 2.2-18 (Continued).

| ID No. | | Area (acres) | Useful Life ³ (years) |
|----------------------------------|-------------------|-----------------|-------------------------------------|
| <u>Sand Tailings²</u> | | | |
| 1 | Dam construction | 0 | 2 |
| 2 | Dam construction | 0 | 0.5 |
| 3 | Tailings fill | 171 | 0.5 |
| 4 | Tailings fill | 198 | 1 |
| 5 | Tailings fill | 150 | 0.5 |
| 6 | Tailings fill | 211 | 0.5 |
| 7 | Tailings fill | 253 | 1 |
| 8 | Dam construction | 0 | 2 |
| 9 | Tailings fill | 55 | 0.5 |
| 10 | Tailings fill | 88 | 3 months |
| 11 | Dam stabilization | 70 | 3 months |
| 12 | Tailings fill | 183 | 1 |
| 13 | Tailings fill | 196 | 1 |
| 14 | Tailings fill | 135 | 0.5 |
| 15 | Tailings fill | 312 | 1 |
| 16 | Tailings fill | 193 | 1 |
| 17 | Elevated fill | 50 | 2 months |
| 18 | Dam construction | 0 | 0.5 |
| 19 | Tailings fill | 62 | 3 months |
| 20 | Dam construction | 0 | 1.5 |
| 21 | Dam stabilization | 350 | 0.5 |
| 22 | Tailings fill | 190 | 1 |
| 23 | Elevated fill | 250 | 0.5 |
| 24 | Tailings fill | 133 | 0.5 |
| | Total | 3250 | |

¹See Figure 2.2-20.

²See Figure 2.2-22.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

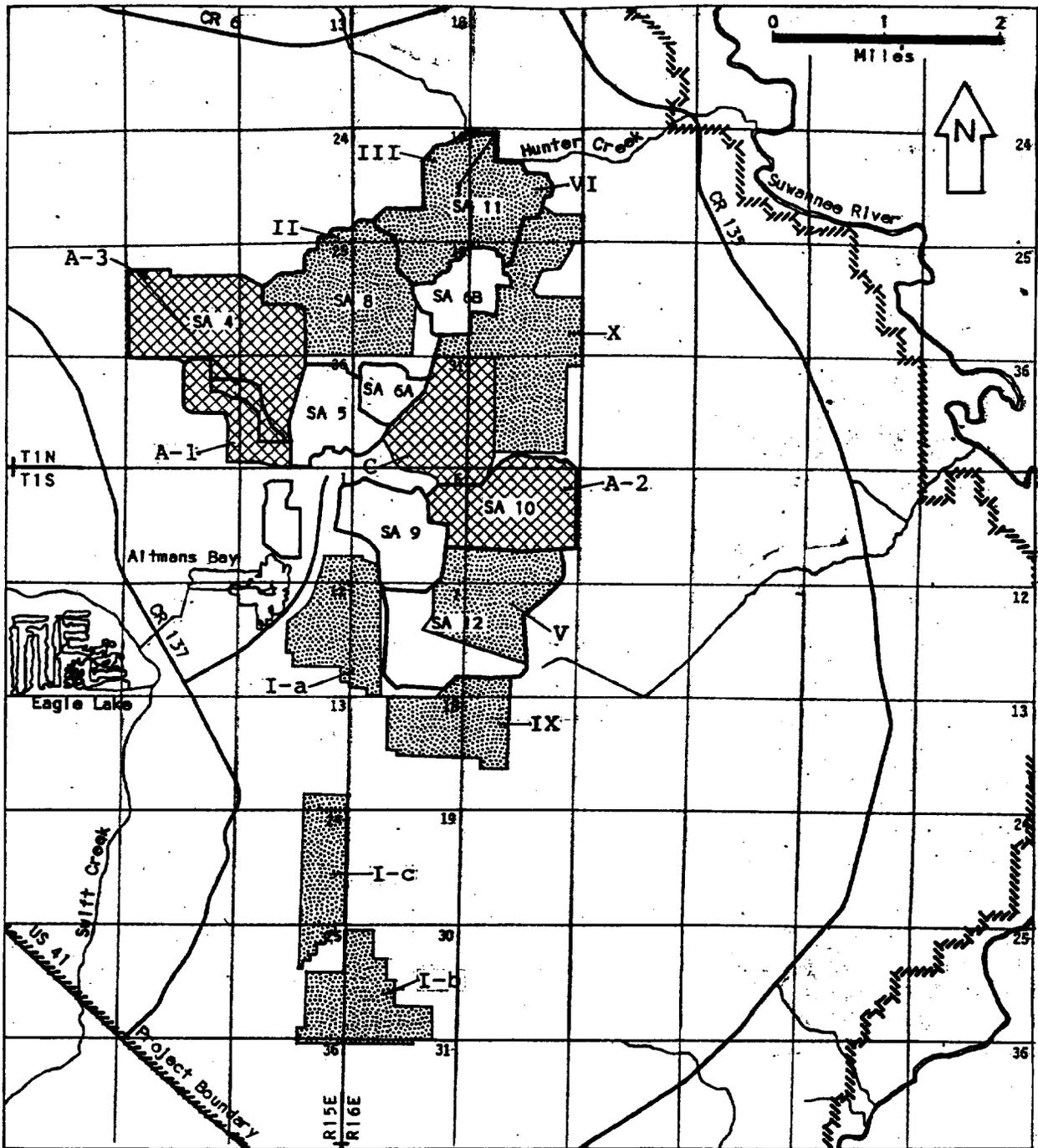


Figure 2.2-21.
 Mudball and Tailings Sand Disposal Areas for Suwannee River Mine, Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

Disposal Areas

 Tailings sand

 Mudball

SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

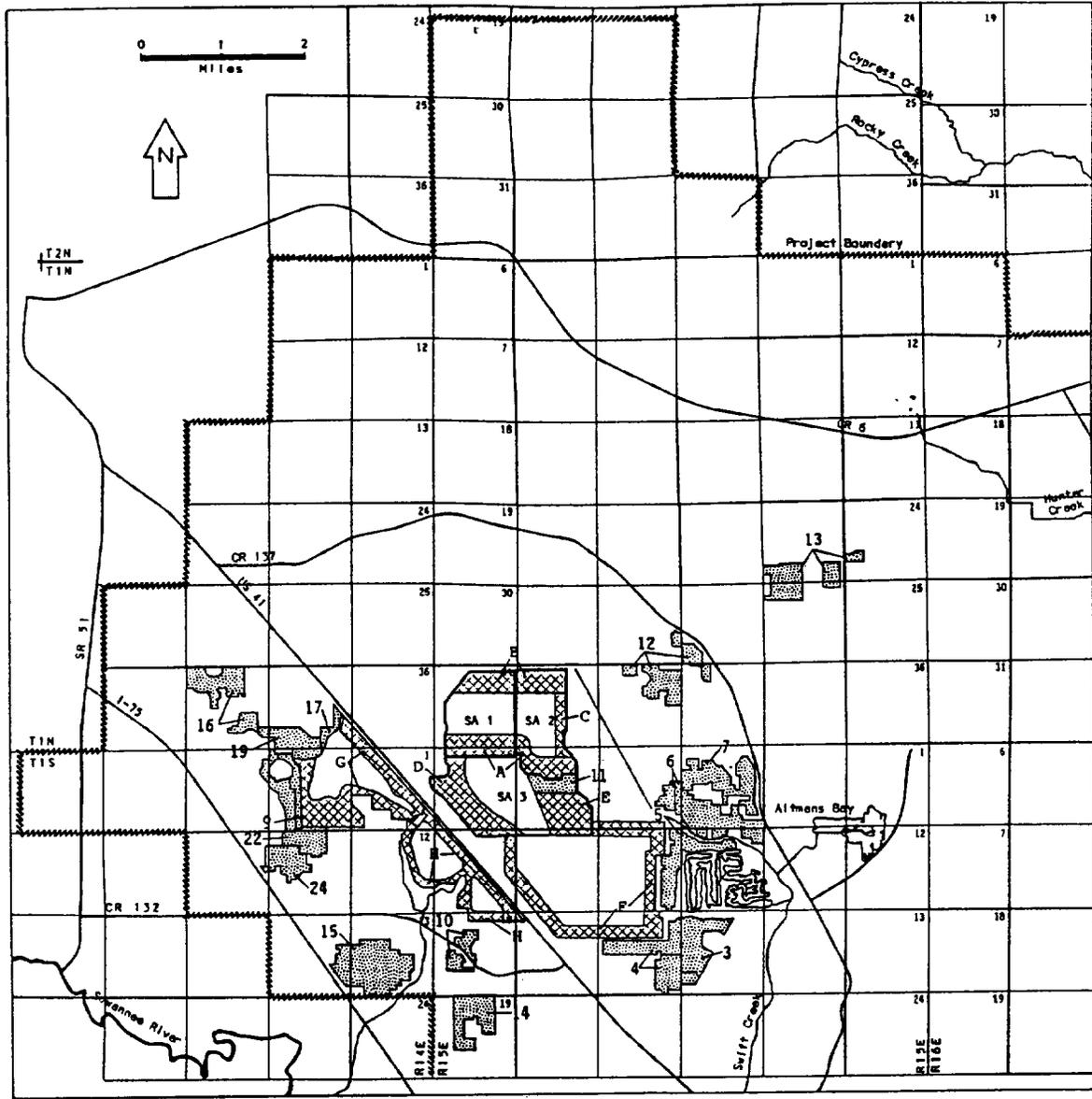


Figure 2.2-22.
 Mudball and Tailings Sand Disposal Areas for Swift
 Creek Mine, Alternative C: Mining Only Small Isolated
 or Weakly/Periodically Connected Wetlands Containing
 Reserves.

Disposal Areas
 [Stippled Box] Tailings sand
 [Cross-hatched Box] Mudball
 SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-19. Reclamation Schedule and Acreages for the Suwannee River Mine for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|-------|-------|------------------------|----------------|---------------|---------------|
| 1 | 587 | 110 | 110 | 0 | 0 |
| 2 | 568 | 306 | 306 | 0 | 0 |
| 3 | 580 | 214 | 214 | 0 | 0 |
| 4 | 562 | 230 | 130 | 0 | 100 |
| 5 | 531 | 355 | 127 | 0 | 228 |
| 6 | 572 | 357 | 357 | 0 | 0 |
| 7 | 587 | 348 | 348 | 0 | 0 |
| 8 | 503 | 809 | 456 | 353 | 0 |
| 9 | 525 | 1,316 | 572 | 278 | 466 |
| 10 | 582 | 587 | 587 | 0 | 0 |
| 11 | 505 | 924 | 503 | 421 | 0 |
| 12 | 589 | 961 | 525 | 0 | 436 |
| 13 | 525 | 1,028 | 582 | 0 | 446 |
| 14 | 302 | 505 | 505 | 0 | 0 |
| 15 | 0 | 2,186 | 589 | 0 | 1,597 |
| 16 | 0 | 915 | 525 | 0 | 390 |
| 17 | 0 | 4,091 | 302 | 0 | 3,789 |
| Total | 7,518 | 15,242 | 6,738 | 1,052 | 7,452 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).

Table 2.2-20. Reclamation Schedule and Acreages for the Swift Creek Mine for Alternative C: Mining Only Small Isolated or Weakly/Periodically Connected Wetlands Containing Reserves.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|-------|-------|------------------------|----------------|---------------|---------------|
| 1 | 530 | 0 | 0 | 0 | 0 |
| 2 | 521 | 0 | 0 | 0 | 0 |
| 3 | 482 | 0 | 0 | 0 | 0 |
| 4 | 629 | 20 | 20 | 0 | 0 |
| 5 | 538 | 102 | 102 | 0 | 0 |
| 6 | 425 | 171 | 0 | 171 | 0 |
| 7 | 425 | 659 | 166 | 198 | 295 |
| 8 | 456 | 560 | 19 | 361 | 180 |
| 9 | 465 | 408 | 20 | 253 | 135 |
| 10 | 522 | 4 | 4 | 0 | 0 |
| 11 | 514 | 213 | 213 | 0 | 0 |
| 12 | 526 | 328 | 185 | 143 | 0 |
| 13 | 553 | 917 | 307 | 0 | 610 |
| 14 | 531 | 1,176 | 467 | 379 | 330 |
| 15 | 563 | 422 | 287 | 135 | 0 |
| 16 | 483 | 988 | 386 | 312 | 290 |
| 17 | 558 | 487 | 294 | 193 | 0 |
| 18 | 507 | 336 | 274 | 62 | 0 |
| 19 | 0 | 499 | 449 | 0 | 50 |
| 20 | 0 | 1,998 | 608 | 190 | 1,200 |
| 21 | 0 | 2,360 | 507 | 133 | 1,720 |
| Total | 9,228 | 11,648 | 4,308 | 2,530 | 4,810 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).

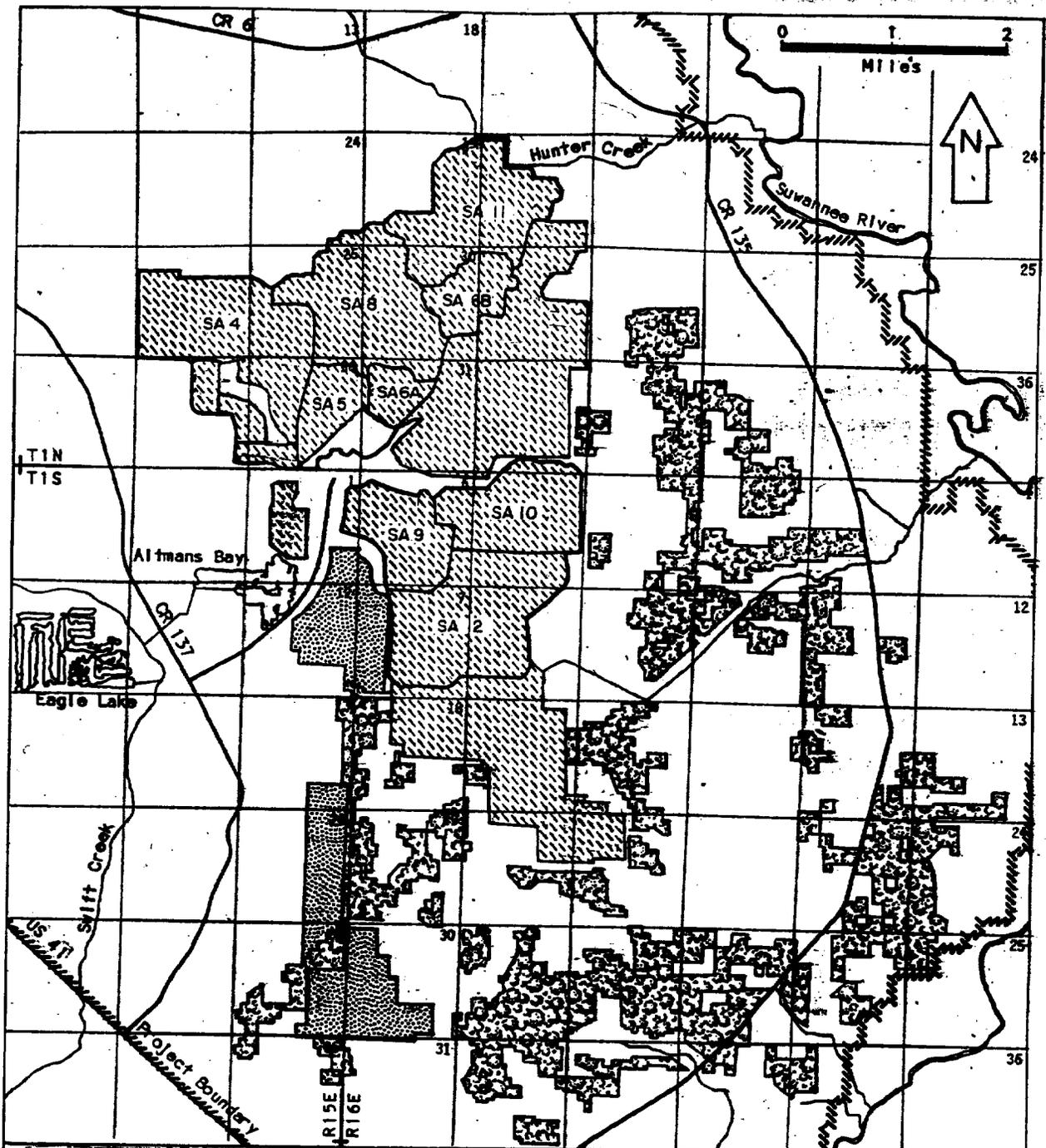


Figure 2.2-23.
 Reclamation Plan for Suwannee River Mine, Alternative C:
 Mining Only Small Isolated or Weakly/Periodically
 Connected Wetlands Containing Reserves.

Note:
 Includes both mandatory and nonmandatory reclamation lands and assumes
 that nonmandatory lands will be reclaimed under Chapter 378, FS, and
 Chapter 16C-17, FAC.

-  Tails fill
-  Land & lakes
-  Elevated fill
- SA** Clay settling area

Only portions of streams not physically disturbed by mining or
 mine support activities are shown.

2.2.4 Alternative D: Mining in Areas Requiring Only ACOE Permits

2.2.4.1 Alternative Description

This mining alternative assumes that all upland areas containing reserves and all wetland areas containing reserves, with the exception of those under FDER jurisdiction, will be mined. The Suwannee River Mine will operate one 45 cu yd and two 30 cu yd draglines. The average annual production rate is estimated to be 2.3 million tons of concentrate for mining years 1-18. The Swift Creek Mine will operate three 45 cu yd draglines with an annual production rate of approximately 2.2 million tons of concentrate for mining years 1-25.

This mining alternative will result in the extraction and processing of approximately 88% of the reserves on the Suwannee River Mine and approximately 94% of the reserves on the Swift Creek Mine and will shorten the planned mine life by 3 years (14%) and 1 year (4%), respectively. The remaining reserves lie under areas of FDER jurisdiction which are not scheduled for mining under this alternative or would be lost due to mining restrictions resulting from having to avoid wetland areas.

2.2.4.2 Mining Schedule for Alternative D: Mining in Areas Requiring Only ACOE Permits

Approximately 24,157 acres are proposed for mining under this alternative (Table 2.2-21, Figures 2.2-25 and 2.2-26). An additional 3704 acres will be used for waste disposal activities. The average yearly mining rate for the Suwannee River and Swift Creek mines will be 562 acres and 578 acres, respectively. Acreages of land use categories to be mined and/or utilized for mine support activities under this alternative are presented in Table 2.2-22.

2.2.4.3 Type, Composition, and Quantity of Materials to Be Excavated or Filled for Alternative D: Mining in Areas Requiring Only ACOE Permits

Based on data from exploratory borings and existing mining operations, the excavation quantities were computed to be as follows:

| <u>Material</u> | <u>Approx. Total Excavation for Mine Life (cu yd)</u> | <u>Average Yearly Excavation Rate (cu yd)</u> |
|---------------------|---|---|
| Suwannee River Mine | 631,246,000 | 35,243,882 |
| Swift Creek Mine | 768,266,000 | 31,842,083 |

2.2.4.4 Waste Disposal for Alternative D: Mining in Areas Requiring Only ACOE Permits

Approximately 17,582 acres of waste clay disposal areas will be utilized for both the Suwannee River and Swift Creek mines (Table 2.2-23). This includes existing waste clay disposal areas presently in operation (5881 acres, 33%) as well as those currently under construction for existing

Table 2.2-21. Mining Schedule and Acreages for Suwannee River and Swift Creek Mines for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| Year | Suwannee River Mine | Swift Creek Mine | Year Total | Cumulative Total |
|--------------|---------------------|------------------|---------------|------------------|
| 1 | 587 | 530 | 1,117 | 1,117 |
| 2 | 568 | 521 | 1,089 | 2,206 |
| 3 | 531 | 478 | 1,009 | 3,215 |
| 4 | 654 | 606 | 1,260 | 4,475 |
| 5 | 625 | 665 | 1,290 | 5,765 |
| 6 | 560 | 789 | 1,349 | 7,114 |
| 7 | 567 | 766 | 1,333 | 8,447 |
| 8 | 618 | 589 | 1,207 | 9,654 |
| 9 | 601 | 659 | 1,260 | 10,914 |
| 10 | 521 | 715 | 1,236 | 12,150 |
| 11 | 552 | 613 | 1,165 | 13,315 |
| 12 | 628 | 612 | 1,240 | 14,555 |
| 13 | 571 | 595 | 1,166 | 15,721 |
| 14 | 532 | 539 | 1,071 | 16,792 |
| 15 | 526 | 482 | 1,008 | 17,800 |
| 16 | 451 | 497 | 948 | 18,748 |
| 17 | 467 | 506 | 973 | 19,721 |
| 18 | 447 | 532 | 979 | 20,700 |
| 19 | 0 | 487 | 487 | 21,187 |
| 20 | 0 | 506 | 506 | 21,693 |
| 21 | 0 | 501 | 501 | 22,194 |
| 22 | 0 | 561 | 561 | 22,755 |
| 23 | 0 | 559 | 559 | 23,314 |
| 24 | 0 | 559 | 559 | 23,873 |
| 25 | 0 | 284 | 284 | 24,157 |
| Total | 10,006 | 14,151 | 24,157 | 24,157 |

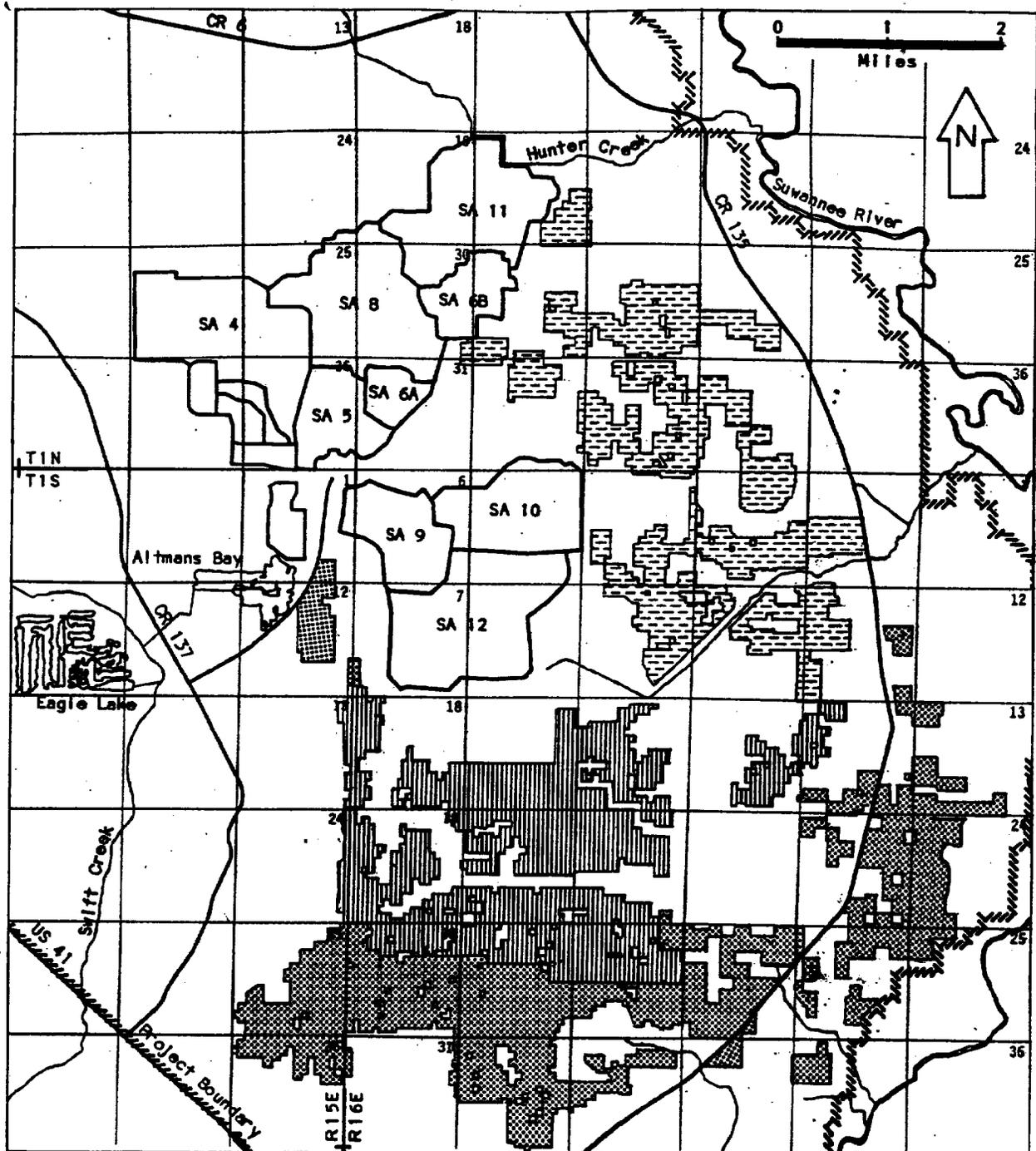


Figure 2.2-25.
 Mining Areas for Suwannee River Mine, Alternative D:
 Mining in Areas Requiring Only ACOE Permits.

- Dragline**
-  Number 1
 -  Number 2
 -  Number 3

SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

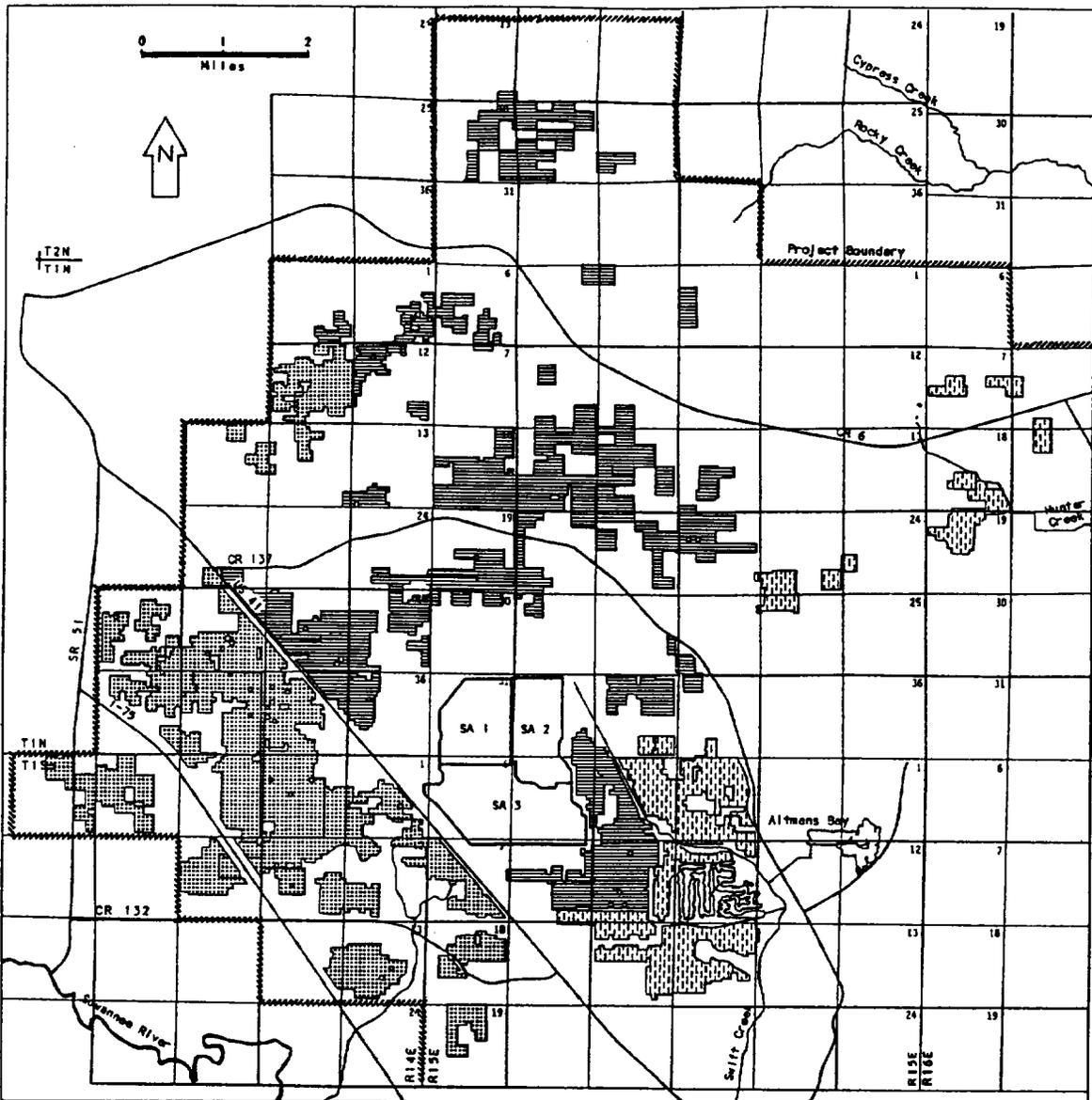


Figure 2.2-26.
Mining Areas for Swift Creek Mine, Alternative D:
Mining in Areas Requiring Only ACOE Permits.

- Dragline
-  Number 4
 -  Number 5
 -  Number 6
 - SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-22. Acreages of Land Use and Cover Types to Be Mined for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| Code ¹ | Description | Approx. Acreage ² | % of Total Site ² | Approx. Acreage to Be Disturbed ² | % of Cover Type ² |
|---------------------------|--|------------------------------|------------------------------|--|------------------------------|
| DEVELOPED AREA | | | | | |
| 111 | Residential, single unit, low density | 53 | <0.1 | 2 | 3.8 |
| 112 | Residential, single unit, medium density | 5 | <0.1 | 5 | 100.0 |
| 114 | Mobile homes, medium density | 18 | <0.1 | 0 | 0 |
| 123 | Offices and professional services | 20 | <0.1 | 0 | 0 |
| 131 | Light industrial | 13 | <0.1 | 0 | 0 |
| 144 | Major roads, highways, and railroads | 524 | 0.5 | 0 | 0 |
| 152 | Major long distance transmission lines | 27 | <0.1 | 0 | 0 |
| 162 | Religious facilities, excluding schools | 3 | <0.1 | 0 | 0 |
| 167 | Cemeteries | 4 | <0.1 | 0 | 0 |
| 193 | Land undergoing active development | 21 | <0.1 | 20 | 95.2 |
| | Subtotal | 688 | 0.7 | 27 | 3.9 |
| UPLAND COMMUNITIES | | | | | |
| 211 | Row crops | 3,976 | 4.0 | 415 | 10.4 |
| 212 | Field crops | 2,509 | 2.5 | 624 | 24.9 |
| 213 | Improved pasture | 1,302 | 1.3 | 20 | 1.5 |
| 222 | Deciduous fruit orchard | 1 | <0.1 | 0 | 0 |
| 231 | Pecan orchard | 1 | <0.1 | 0 | 0 |
| 242 | Confined feeding operations | 51 | <0.1 | 8 | 15.7 |
| 323 | Scrub/brush rangeland | 105 | 0.1 | 0 | 0 |
| 411 | Pine flatwoods | 3,935 | 3.9 | 1,616 | 41.1 |
| 422 | Other hardwoods | 87 | <0.1 | 33 | 37.9 |
| 431 | Mixed forest | 12,399 | 12.4 | 2,665 | 21.5 |
| 441 | Planted coniferous forest | 24,861 | 24.8 | 8,412 | 33.8 |
| 451 | Clearcut areas | 9,195 | 9.2 | 4,509 | 49.0 |
| 741 | Scraped areas | 8 | <0.1 | 5 | 62.5 |
| 742 | Dredge and fill areas | 382 | 0.4 | 237 | 62.0 |
| 760 | Mining and processing | 15,379 | 15.4 | 666 | 4.3 |
| | Subtotal | 74,191 | 74.0 | 19,210 | 25.9 |

Table 2.2-22 (Continued).

| Code ¹ | Description | Approx. ² Acreage ² | % of Total Site ² | Approx. Acreage to Be Mined ² | % of Cover Type ² |
|----------------------------|------------------------------|--|---------------------------------|---|---------------------------------|
| WETLAND COMMUNITIES | | | | | |
| 6110 | Cypress | 1,970 | 2.0 | 521 | 26.4 |
| 6211 | Swamp tupelo | 775 | 0.8 | 319 | 41.2 |
| 6212 | Bayhead | 1,322 | 1.3 | 434 | 32.8 |
| 6213 | Scrub/shrub | 1,314 | 1.3 | 313 | 23.8 |
| 6311 | Cypress/swamp tupelo/bay | 12,633 | 12.6 | 4,232 | 33.5 |
| 6312 | Swamp tupelo/bay/pine | 6,291 | 6.3 | 2,621 | 41.2 |
| 6410 | Emergent | 430 | 0.4 | 161 | 37.4 |
| | Subtotal | 24,735 | 24.7 | 8,601 | 34.8 |
| AQUATIC COMMUNITIES | | | | | |
| 513 | Canals | 66 | <0.1 | 12 | 18.2 |
| 521 | Mine pits reclaimed to lakes | 17 | <0.1 | 0 | 0 |
| 531 | Reservoirs | 434 | 0.4 | 5 | 1.2 |
| 561 | Ponds | 73 | <0.1 | 6 | 8.2 |
| | Subtotal | 590 | 0.6 | 23 | 3.9 |
| Total | | 100,204 | 100 | 27,861 | 27.8 |

¹Based on Florida Land Use and Cover Classification System (Fla. Dept. of Administration 1976).

²All acreages, percentages, and totals have been rounded.

Table 2.2-23. Characteristics of Waste Clay Disposal Areas at the Suwannee River and Swift Creek Mines for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| ID No. ¹ | Area (acres) | \bar{x} Base Elev. (ft NGVD) | Inside Crest (ft NGVD) | Max. Fluid Elev. (ft NGVD) | \bar{x} Initial Height of Clays Above Grade (ft) |
|----------------------------|--------------|--------------------------------|------------------------|----------------------------|--|
| <u>Suwannee River Mine</u> | | | | | |
| 1 | 100 | 127 | 147 | 142 | 15 |
| 2 | 74 | 129 | 147 | 142 | 11 |
| 3A | 80 | 131 | 147 | 142 | 11 |
| 3B | 74 | 131 | 147 | 142 | 11 |
| 4 | 732 | 130 | 157 | 152 | 22 |
| 5 | 133 | 128 | 147 | 142 | 14 |
| 6A | 167 | 128 | 147 | 142 | 14 |
| 6B | 250 | 124 | 147 | 142 | 18 |
| 7 ² | 550 | 131 | 145 | 140 | 9 |
| 8 | 786 | 127 | 147 | 142 | 15 |
| 9 | 429 | 131 | 157 | 152 | 21 |
| 10 | 466 | 134 | 157 | 152 | 18 |
| 11 | 640 | 122 | 145 | 140 | 18 |
| 12 | 920 | 133 | 157 | 152 | 19 |
| 13 ² | 621 | 133 | 157 | 152 | 19 |
| 14 ³ | 1,650 | 135 | 157 | 152 | 17 |
| 15 ³ | 280 | 125 | 145 | 140 | 15 |
| 16 ³ | 865 | 129 | 145 | 140 | 11 |
| 17 ³ | 690 | 130 | 145 | 140 | 10 |
| 18 ³ | 1,290 | 131 | 145 | 140 | 9 |
| Subtotal/ \bar{x} | 10,797 | 129 | 149 | 144 | 15 |
| <u>Swift Creek Mine</u> | | | | | |
| 1 | 520 | 133 | 157 | 152 | 19 |
| 2 | 510 | 130 | 157 | 152 | 22 |
| 3 ² | 900 | 134 | 157 | 152 | 18 |
| 4 ³ | 1,200 | 133 | 157 | 152 | 19 |
| 5 ³ | 480 | 124 | 157 | 152 | 28 |
| 6 ³ | 920 | 125 | 157 | 152 | 27 |
| 7 ³ | 640 | 126 | 157 | 152 | 26 |
| 8 ³ | 695 | 124 | 157 | 152 | 28 |
| 9 ³ | 920 | 129 | 155 | 150 | 21 |
| Subtotal/ \bar{x} | 6,785 | 129 | 157 | 152 | 23 |
| Total/ \bar{x} | 17,582 | 129 | 152 | 147 | 17 |

¹See Figures 2.2-27 and 2.2-28.

²Under construction.

³Proposed construction.

operations (2071 acres, 12%) and proposed for construction (9630 acres, 55%) under this mining alternative (Figures 2.2-27 and 2.2-28). At the Suwannee River Mine, clay settling areas 7 and 11 through 18 will be used for new mining, and settling areas 3 through 9 on the Swift Creek Mine will be used for new mining (Tables 2.2-24 and 2.2-25).

Mudball waste material will be used for capping on waste clay settling areas over a total of 4413 acres (Tables 2.2-24 and 2.2-25, Figures 2.2-29 and 2.2-30). Sand tailings will be used for dam construction, backfill for mine cuts, and capping of waste clay settling areas; approximately 6973 acres of mine cuts will be backfilled with sand tailings, and approximately 3717 acres will be elevated fill (Tables 2.2-24 and 2.2-25, Figures 2.2-29 and 2.2-30).

2.2.4.5 Reclamation Schedule for Alternative D: Mining in Areas Requiring Only ACOE Permits

A total of approximately 36,298 acres will be reclaimed into either land and lakes, tailings fill, or elevated fill (Figures 2.2-31 and 2.2-32). This reclamation total includes previous mining and associated activities (e.g., existing waste clay disposal areas) as well as mining proposed under this alternative. Approximately 12,640 acres (35%) will be in land and lakes (50% wetland areas and open water) with approximately 6166 acres (17%) and approximately 17,492 acres (48%) in tailings fill and elevated fill, respectively (Tables 2.2-26 and 2.2-27).

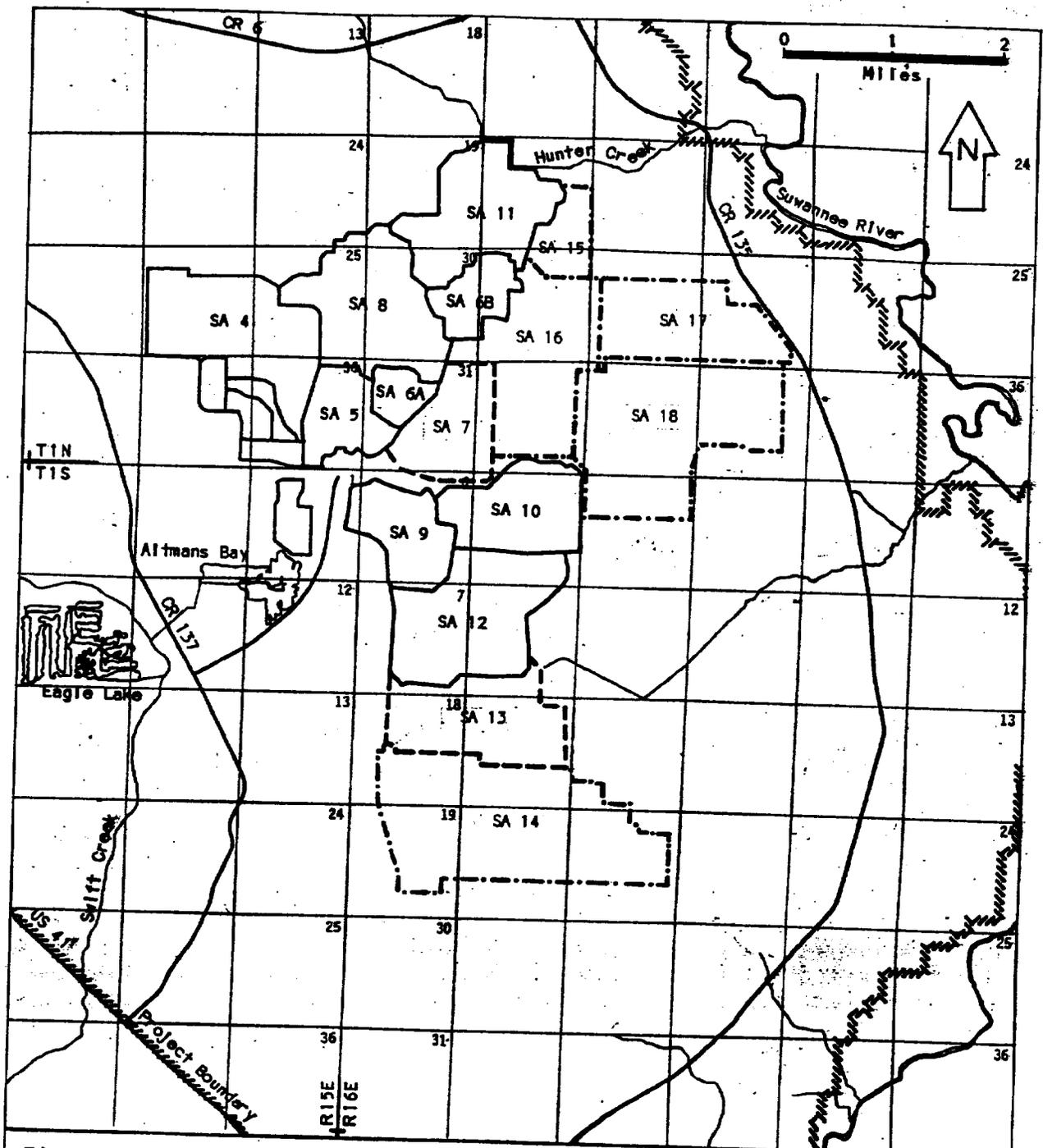


Figure 2.2-27.
 Waste Clay Disposal Areas for Suwannee River Mine,
 Alternative D: Mining in Areas Requiring Only ACOE
 Permits.

Settling Areas (SA)
 — Existing
 - - - Under construction
 - · - · Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

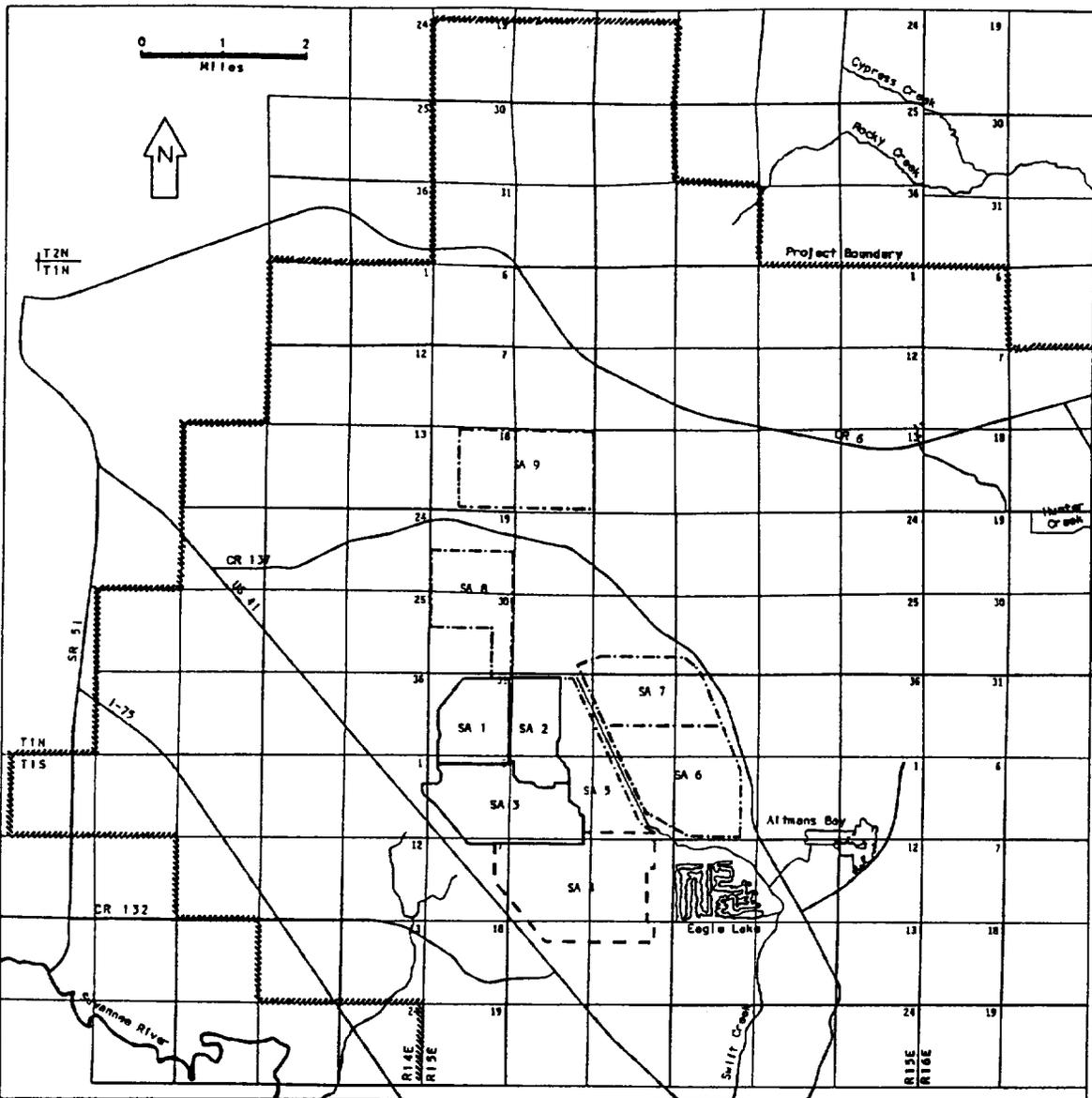


Figure 2.2-28.
 Waste Clay Disposal Areas for Swift Creek Mine,
 Alternative D: Mining in Areas Requiring Only ACOE
 Permits.

Settling Areas(SA)
 — Existing
 - - - Under construction
 - · - · - Proposed

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-24. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Suwannee River Mine for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| ID No. | Area (acres) | Useful Life ³ (years) | |
|----------------------------------|------------------|----------------------------------|-----|
| <u>Waste Clay¹</u> | | | |
| 7 | 550 | 3 | |
| 11 | 640 | 6 | |
| 12 | 920 | 3.5 | |
| 13 | 621 | 4.5 | |
| 14 | 1650 | 8.5 | |
| 15 | 280 | 1.5 | |
| 16 | 865 | 4 | |
| 17 | 690 | 3 | |
| 18 | 1290 | 1 | |
| Total | 7506 | | |
| <u>Mudball²</u> | | | |
| A-1 | 173 | 2 | |
| A-2 | 326 | 3.5 | |
| A-3 | 512 | 5.5 | |
| C | 346 | 3.5 | |
| D | 257 | 3 | |
| E | 59 | 0.5 | |
| Total | 1673 | | |
| <u>Sand Tailings²</u> | | | |
| I-a | Tailings fill | 390 | 4 |
| SA 13 ¹ | Dam construction | 0 | 2.5 |
| I-c | Tailings fill | 265 | 1 |
| I-b | Tailings fill | 397 | 2 |
| II | Elevated fill | 305 | 1 |
| III | Elevated fill | 312 | 1 |
| V-a | Elevated fill | 400 | 1 |
| V-b | Tailings fill | 322 | 1.5 |
| VI-a | Elevated fill | 206 | 1 |
| VI-b | Tailings fill | 537 | 2 |
| VII | Elevated fill | 196 | 1 |
| VIII | Elevated fill | 350 | 1 |
| IX | Elevated fill | 178 | 0.5 |
| Total | | 3858 | |

¹See Figure 2.2-27.

²See Figure 2.2-29.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

Table 2.2-25. Waste Clay, Mudball, and Sand Tailings Disposal Acreages for the Swift Creek Mine for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| ID No. | Area (acres) | Useful Life ³ (years) |
|-------------------------------|-----------------|-------------------------------------|
| <u>Waste Clay¹</u> | | |
| 3 | 900 | 4 |
| 4 | 1200 | 4.5 |
| 5 | 480 | 3 |
| 6 | 920 | 4 |
| 7 | 640 | 3.5 |
| 8 | 695 | 4 |
| 9 | 920 | 5 |
| Total | 5755 | |
| <u>Mudball²</u> | | |
| A | 295 | 4 |
| B | 170 | 2 |
| C | 270 | 0.5 |
| D | 400 | 2 |
| E | 280 | 1.5 |
| F | 400 | 3.5 |
| G | 330 | 3.5 |
| H | 250 | 3 |
| I | 300 | 3.5 |
| J | 45 | 1 |
| Total | 2740 | |

Table 2.2-25 (Continued).

| ID No. | | Area (acres) | Useful Life ³ (years) |
|----------------------------------|------------------|-----------------|-------------------------------------|
| <u>Sand Tailings²</u> | | | |
| 1 | Dam construction | 0 | 2 |
| 2 | Dam construction | 0 | 0.5 |
| 3 | Elevated fill | 270 | 1 |
| 4 | Tailings fill | 171 | 0.5 |
| 5 | Tailings fill | 178 | 0.5 |
| 6 | Tailings fill | 176 | 0.5 |
| 7 | Elevated fill | 100 | 3 months |
| 8 | Elevated fill | 550 | 0.5 |
| 9 | Elevated fill | 350 | 0.5 |
| 10 | Dam construction | 0 | 1 |
| 11 | Tailings fill | 206 | 1 |
| 12 | Tailings fill | 248 | 1 |
| 13 | Tailings fill | 249 | 1 |
| 14 | Tailings fill | 121 | 0.5 |
| 15 | Tailings fill | 132 | 0.5 |
| 16 | Tailings fill | 311 | 1 |
| 17 | Tailings fill | 60 | 2 months |
| 18 | Elevated fill | 500 | 1 |
| 19 | Tailings fill | 257 | 1 |
| 20 | Tailings fill | 271 | 1 |
| 21 | Tailings fill | 310 | 1 |
| 22 | Tailings fill | 320 | 1 |
| 23 | Tailings fill | 254 | 1 |
| 24 | Tailings fill | 124 | 1 |
| 25 | Elevated fill | 450 | 1 |
| 26 | Tailings fill | 174 | 1 |
| 27 | Tailings fill | 214 | 1 |
| 28 | Tailings fill | 182 | 0.5 |
| 29 | Tailings fill | 188 | 1 |
| 30 | Tailings fill | 109 | 0.5 |
| 31 | Elevated fill | 170 | 0.5 |
| 32 | Elevated fill | 440 | 1 |
| Total | | 7085 | |

¹See Figure 2.2-28.

²See Figure 2.2-30.

³For waste clay disposal areas, useful life is the approximate duration of pumping clays into settling areas.

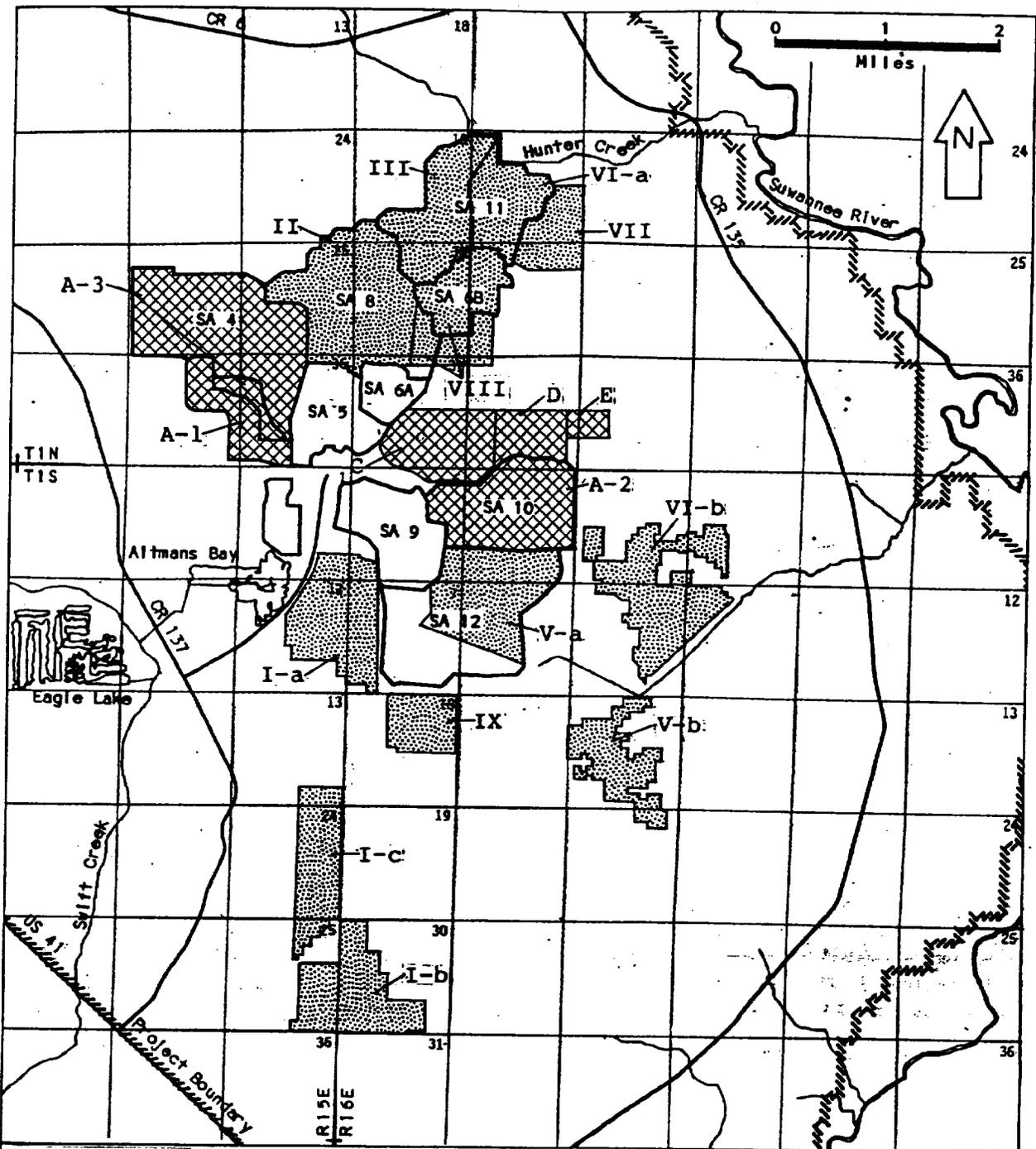


Figure 2.2-29.
 Mudball and Tailings Sand Disposal Areas for
 Suwannee River Mine, Alternative D: Mining in Areas
 Requiring Only ACOE Permits.

- Disposal Areas**
-  Tailings sand
 -  Mudball
 - SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

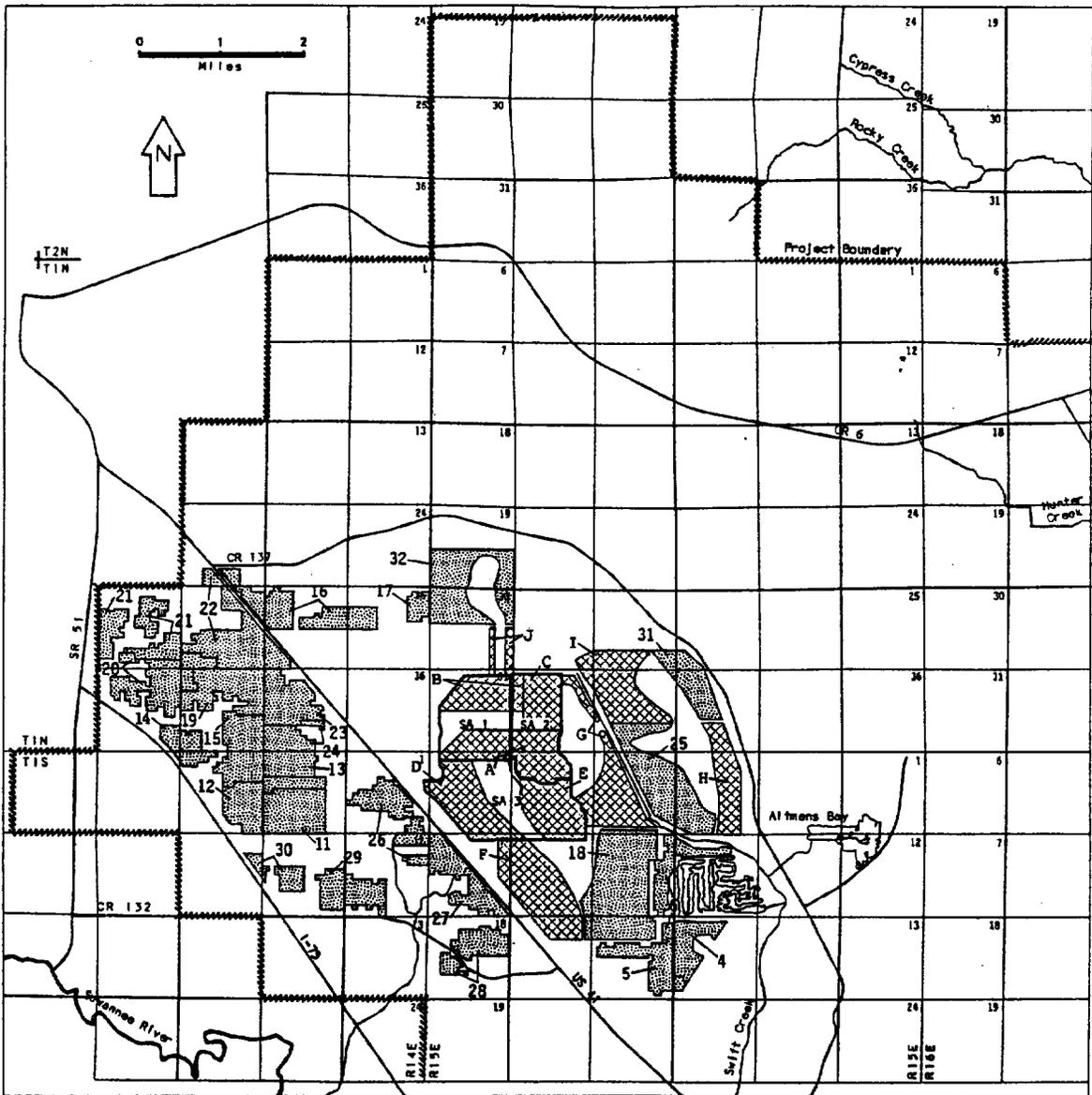


Figure 2.2-30.
Mudball and Tailings Sand Disposal Areas for Swift Creek Mine, Alternative D: Mining in Areas Requiring Only ACOE Permits.

Disposal Areas
 [Stippled Box] Tailings sand
 [Cross-hatched Box] Mudball
 SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

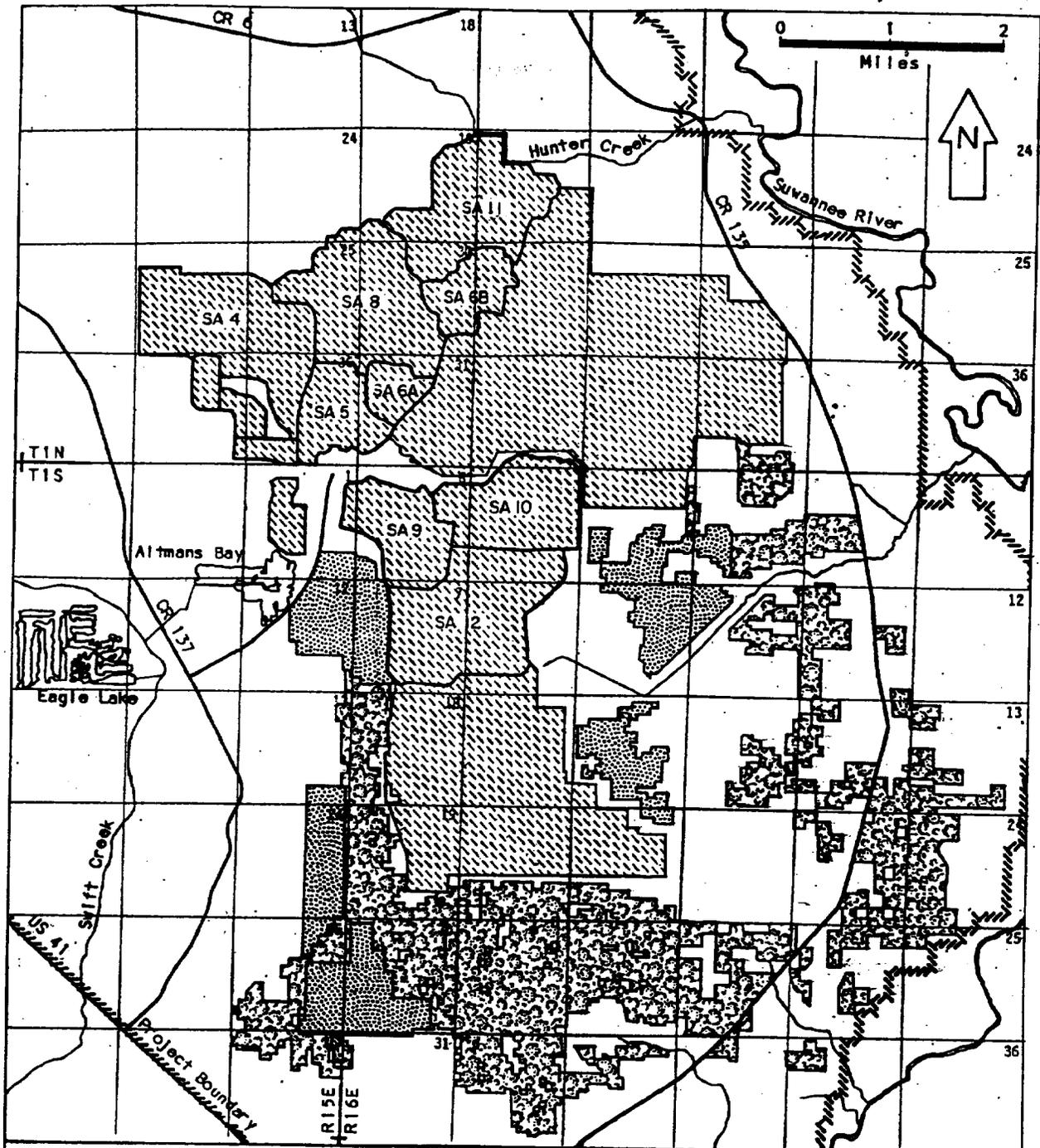


Figure 2.2-31.

Reclamation Plan for Suwannee River Mine, Alternative D:
Mining in Areas Requiring Only ACOE Permits.

Note:
Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

-  Talls fill
-  Land & lakes
-  Elevated fill
-  SA Clay settling area

Only portions of streams not physically disturbed by mining or mine support activities are shown.

Table 2.2-26. Reclamation Schedule and Acreages for the Suwannee River Mine for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|-------|--------|------------------------|----------------|---------------|---------------|
| 1 | 587 | 110 | 110 | 0 | 0 |
| 2 | 568 | 306 | 306 | 0 | 0 |
| 3 | 531 | 41 | 41 | 0 | 0 |
| 4 | 654 | 230 | 130 | 0 | 100 |
| 5 | 625 | 355 | 127 | 0 | 228 |
| 6 | 560 | 312 | 312 | 0 | 0 |
| 7 | 567 | 317 | 317 | 0 | 0 |
| 8 | 618 | 601 | 248 | 353 | 0 |
| 9 | 601 | 959 | 215 | 278 | 466 |
| 10 | 521 | 261 | 261 | 0 | 0 |
| 11 | 552 | 837 | 416 | 421 | 0 |
| 12 | 628 | 736 | 300 | 0 | 436 |
| 13 | 571 | 672 | 226 | 0 | 446 |
| 14 | 532 | 1,691 | 388 | 0 | 1,303 |
| 15 | 526 | 470 | 470 | 0 | 0 |
| 16 | 451 | 1,019 | 403 | 322 | 294 |
| 17 | 467 | 590 | 353 | 237 | 0 |
| 18 | 447 | 930 | 339 | 245 | 346 |
| 19 | 0 | 500 | 445 | 55 | 0 |
| 20 | 0 | 747 | 467 | 0 | 280 |
| 21 | 0 | 7,345 | 447 | 0 | 6,898 |
| Total | 10,006 | 19,029 | 6,321 | 1,911 | 10,797 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).

Table 2.2-27. Reclamation Schedule and Acreages for the Swift Creek Mine for Alternative D: Mining in Areas Requiring Only ACOE Permits.

| Year | Mined | Reclaimed ¹ | Land and Lakes | Tailings Fill | Elevated Fill |
|--------------|---------------|------------------------|----------------|---------------|---------------|
| 1 | 530 | 0 | 0 | 0 | 0 |
| 2 | 521 | 0 | 0 | 0 | 0 |
| 3 | 478 | 0 | 0 | 0 | 0 |
| 4 | 606 | 20 | 20 | 0 | 0 |
| 5 | 665 | 102 | 102 | 0 | 0 |
| 6 | 789 | 71 | 71 | 0 | 0 |
| 7 | 766 | 583 | 217 | 171 | 195 |
| 8 | 589 | 567 | 213 | 354 | 0 |
| 9 | 659 | 235 | 135 | 0 | 100 |
| 10 | 715 | 234 | 14 | 0 | 220 |
| 11 | 613 | 304 | 98 | 206 | 0 |
| 12 | 612 | 1,172 | 304 | 248 | 620 |
| 13 | 595 | 763 | 261 | 502 | 0 |
| 14 | 539 | 817 | 166 | 371 | 280 |
| 15 | 482 | 902 | 302 | 0 | 600 |
| 16 | 497 | 532 | 275 | 257 | 0 |
| 17 | 506 | 1,156 | 285 | 271 | 600 |
| 18 | 532 | 560 | 250 | 310 | 0 |
| 19 | 487 | 503 | 183 | 320 | 0 |
| 20 | 506 | 354 | 100 | 254 | 0 |
| 21 | 501 | 991 | 387 | 124 | 480 |
| 22 | 561 | 1,124 | 184 | 0 | 940 |
| 23 | 559 | 462 | 288 | 174 | 0 |
| 24 | 559 | 1,015 | 501 | 214 | 300 |
| 25 | 284 | 931 | 561 | 370 | 0 |
| 26 | 0 | 668 | 559 | 109 | 0 |
| 27 | 0 | 1,199 | 559 | 0 | 640 |
| 28 | 0 | 2,004 | 284 | 0 | 1,720 |
| Total | 14,151 | 17,269 | 6,319 | 4,255 | 6,695 |

¹Includes both mandatory and nonmandatory reclamation lands and assumes that nonmandatory lands will be reclaimed under Chapter 378, FS, and Chapter 16C-17, FAC.

Excludes acreage reclaimed prior to January 1982 (total of 2804 acres for entire project area).