

APPENDIX 7.2C GRAVITY MODEL TO ALLOCATE THE IMMIGRATING POPULATION

The approach taken to determining the likely locations of new resident workers is to derive a set of probabilities of location preferences from the populations and commuting distances to the plant site of towns and cities within a 75 mile commuting distance.

Commuting distance is a factor primarily because of the greater transportation costs associated with increased distance, although the amount of time required to commute daily may also be important in making a location decision.

Town size, as measured by population, is considered to be a factor because larger towns generally offer more services and amenities than smaller towns. It is assumed that workers and their families would prefer to reside in or near larger towns or cities, all else being equal. This approach is based on a gravity model similar to that used in both the physical and social sciences.

$$P_i = \frac{\frac{\text{Pop}_i}{D_i^2}}{\frac{\text{Pop}_1}{D_1^2} + \dots + \frac{\text{Pop}_n}{D_n^2}}$$

where P_i = probability that new resident workers would prefer to locate in town (i) relative to other towns within a 75 mile commuting distance.

Pop_i = the latest available (1976) population of town (i).

D_i = commuting distance from town (i) to the site.

n = total number of towns within a 75 mile commuting distance.

This formula expresses the relatively greater attractiveness of larger towns than small towns, and of towns closer to the site than at greater commuting distances; it also indicates that a small town close to the site may be as attractive as a larger town more distance from the site.

Because there are often several small towns within a 75 mile commuting distance of a site which would exert little attraction were they relative

to or at greater distances than larger neighboring towns, certain exclusion criteria can be used to eliminate from consideration towns which would not be expected to experience any appreciable effects. The criteria adopted in this assessment are to consider all towns regardless of size within 5 air miles of a site; to exclude all towns with existing populations less than 500 between 10 and 20 air miles from the site, and to exclude cities with existing populations less than 10,000 between 20 and 50 air miles or 75 highway miles from the site. In addition, cities outside of the 4-County Study Area were excluded due to the alternative construction employment opportunities that exist and will continue to exist in the closer regional trade centers serving these areas.

For each town considered, application of the formula yields the percent of new resident workers that would choose to locate in that town.

APPENDIX 7.2D
PROJECTED ECONOMIC ACTIVITY WITH STANTON ENERGY CENTER
UNIT 1: OPERATION PHASE

Projections of the Study Area economy during operation of the Stanton Energy Center Unit 1 were accomplished by modifying the projections of certain exogenous variables as well as the estimated coefficients of some of the stochastic equations to reflect the primary impacts of operation. Projections of indirect (primary and secondary) impacts on the Study Area economy are shown in Table 7.2D-1 for the operation and phase of the project.

7.3 INCREMENTAL IMPACTS OF ADDITIONAL UNITS

The construction and operation of additional Stanton Energy Center units will also result in direct and indirect socioeconomic impacts. Units 2, 3 and 4 will provide an adequate long-term supply of electricity that is both reliable and economical. They will also indirectly affect economic activity in the Orlando area.

The ultimate capacity of the Stanton Energy Center will be 2,000 megawatts with average annual production projected to be about 10,500 gigawatt hours.

Each additional unit is expected to have construction impacts very similar to those of Unit 1. The local labor supply available at the time of construction will determine the number of construction workers to be imported and so the population impact. Employment, payroll and local expenditure impacts will be very similar to those of Unit 1 except that no additional land will be purchased.

Operating impacts of each additional unit will be slightly less than those of Unit 1. Some of the operating crew will be common to all units resulting in payroll increased of 35, 74 and 101 per cent with the addition of Units 2, 3 and 4.

To the extent that the construction of additional units represents the most economical method of supplying adequate power, gross revenues will be as low as possible and so will payments in lieu of taxes.

As generating capacity is added to the Stanton Energy Center in the future, the beneficial effect of using treated effluent for cooling tower makeup water supply will increase. At the maximum anticipated generating capacity of 2,000 MW, the total average annual reduction in volume of effluent will reach 14,783 gpm or a 32 per cent decrease from the maximum permitted discharge of 46,000 gpm assuming the Iron Bridge Facility is used.

The addition of each unit will also increase coal requirements adding to the traffic congestion caused by unit-coal-train movement. When ultimate site capacity is developed, train traffic from Jacksonville will increase 50 to 100 per cent from existing levels.

TABLE 7.2D-1. PROJECTED ECONOMIC ACTIVITY IMPACTS OF STANTON ENERGY CENTER UNIT 1: OPERATION PHASE 1986-2016*

Year	Population	Total Labor Force	Employment	Unemployment Rate per cent	Personal Income \$1,000	Wages and Salaries \$1,000
1986**	37	25	80	0	1,428	258
1987**	110	75	241	-0.1	4,265	3,758
1990	110	75	241	-0.1	4,265	3,758
1995	110	75	241	-0.1	4,265	3,758
2000	110	75	241	-0.1	4,265	3,758
2005	110	75	241	-0.1	4,265	3,758
2010	110	75	241	0	4,265	3,758
2015	110	75	241	0	4,265	3,758
2016	110	75	241	0	4,265	3,758

Year	Real Wage Rate \$/h	Profit and Proprietors' Income \$1,000	Transfer Payments \$1,000	Contributions for Social Insurance \$1,000	Disposable Income \$1,000	Retail Sales \$1,000
1986**	0	218	0	48	1,278	1,722
1987**	0	652	0	145	3,816	5,149
1990	0	652	0	145	3,816	5,149
1995	0	652	0	145	3,816	5,149
2000	0	652	0	145	3,816	5,149
2005	0	652	0	145	3,816	5,149
2010	0	652	0	145	3,816	5,149
2015	0	652	0	145	3,816	5,149
2016	0	652	0	145	3,816	5,149

Year	State Sales Tax \$1,000	Business Index \$1,000	Bank Deposits \$1,000	Federal Income Tax \$1,000	Local Government Revenues \$1,000
1986**	50	0	363	150	77
1987**	206	0	1,084	449	230
1990	206	0	1,084	449	230
1995	206	0	1,084	449	230
2000	206	0	1,084	449	230
2005	206	0	1,084	449	230
2010	206	0	1,084	449	230
2015	206	0	1,084	449	230
2016	206	0	1,084	449	230

*All dollar amounts in constant \$1980.

**Projected impacts in 1986 and 1987 include impacts resulting from construction and operation. Impacts shown for those years represent only that portion of the total impact attributable to operation activities.

80 ALTERNATIVE
SITES AND TUBES

8.0 ALTERNATE ENERGY SOURCES AND SITES

This chapter includes descriptions of site selection studies and alternate fuels analyses. Section 8.1 consists of an Executive Summary of the site selection study. The information previously requested for Section 8.2 is now included in the Need for Power Document as prescribed by recent amendments to the Florida Electrical Power Plant Siting Act.

8.1 ASSESSMENT OF ALTERNATE SITES

8.1.1 Introduction

In 1979, the Orlando Utilities Commission conducted a site selection study to identify potential sites for a new coal-fueled electric generating station. This study was based on the premise that the site should be able to support at least 1,200 MW of generating capacity and that the first 400 MW unit should be available for initial operation in 1986.

This section of the Site Certification Application summarizes the site selection study and presents technical/economic and environmental information concerning the five candidate sites including the preferred site.

8.1.2 Project Schedule

In the initial stages of the project planning, a simplified schedule was developed to identify eleven (11) major prerequisites to permitting, construction, and operation of a power plant. The schedule originally planned for initial operation of the plant in early 1987.) This schedule was subsequently revised to provide for initial operation in 1986, when the economic savings to OUC's customers and the need to support the national energy policy to reduce oil consumption became more apparent. The 1987 schedule is identified as the original schedule while the 1986 schedule is the revised schedule on Figure 8.1-1. The revised schedule has turned out to be impractical and the original schedule is the current schedule.

8.1.3 Site Selection Plan

✓ Following authorization to proceed with a power plant site selection study, OUC management formed an inter-departmental committee chaired by the Manager of Electric Operations and staffed by representatives from the Electric Generation, Environmental, and System Planning Divisions of the Orlando Utilities Commission. The Committee outlined the project as a four-phased activity as follows.

- I. Organization and Data Acquisition.
- II. Literature/Map Search.
- III. Reconnaissance and Evaluation.
- IV. Final Report.

The five primary considerations in any power plant siting project are as follows.

- (1) Availability of cooling water.
- (2) Transportation of fuel, equipment and materials.
- (3) Transmission of energy to the service area.
- (4) Environmental impacts of construction and operation.
- (5) Public acceptance of the project.

The first major decision was to establish the geographical limits of the search area. To allow consideration of salt water cooling as a possible option, the Atlantic and Gulf coasts were set as East and West boundaries. Considering transmission economics, the North and South boundaries were set reasonably close to the OUC service area. This, in effect, established a twelve county search area in a band running through central Florida between the two coasts. County lines as search area boundaries were arbitrarily chosen for convenience. The search area is shown in Figure 8.1-2. This initial map work was based on U.S.G.S. maps of 1:500,000 scale.

8.1.3.1 Phase I - Organization and Data Acquisition. Phase I consisted primarily of data acquisition:

- (1) Selecting maps of appropriate feature highlights (e.g. topography, transportation, etc.), and various scales.
- (2) Collecting geophysical data.
- (3) Obtaining Federal, State and local protected lands boundary information (parks, recreational areas, forests, wildlife areas, etc.).
- (4) Gathering land use planning data.
- (5) Obtaining agricultural data.

After establishing the search area and completing data acquisition, the areas to be pre-empted from consideration were determined. The initial

exclusions were the environmentally sensitive areas and the urban areas shown on Figure 8.1-3. It was further determined that important agricultural production areas and wetland zones should be excluded. Figure 8.1-4 is a composite of the pre-empted areas.

This left for consideration, the clear areas of Figure 8.1-4. The final element of Phase I, the establishment of candidate zone criteria provided manageable data for detailed analysis and yet provided sufficient resolution to support discrete site identification.

8.1.3.2 Phase II - Literature and Map Search. Phase II was basically a search of the data gathered during Phase I, organized by developing overlays for the next larger scale map (1:250,000). This identified the preferred areas for siting. The transportation and transmission corridors were located and are shown on Figure 8.1-5.

The analysis at this level yielded twenty candidate zones of irregular configuration, varying in total area from 30 to 50 square miles. These zones are outlined on Figure 8.1-6 and identified by arabic numerals 1 through 20.

Up to this point, the study dealt with gross area maps and data suitable for the intended purpose of macroanalyses of the total search area. The next step required more detailed data to identify potential plant sites within the identified candidate zones. Accordingly, for further studies, the U.S.G.S. 7-1/2 minute map series (1:24,000) was utilized. A site size criterion of 3,000 acres $\pm$ 20 per cent was established and applied with the basic requirements (water source, transportation, transmission, etc.), to yield an inventory of 22 potential sites. Sites were identified by suffixing an alphabetical letter to the zone number (e.g. 20A). Some zones produced several sites and a few produced none. See Figure 8.1-7.

Early in Phase II, state regulatory officials were informed of this power plant siting activity. An informal meeting was held, at Orlando Utilities Commission's request, in Tallahassee on May 8, 1979 to exchange information and to initiate an early interchange of ideas relative to site selection. The intention was to solicit specific comments and guidance

during the course of site selection. The search area and several of the zones under consideration were identified and it was agreed that OUC would keep the agencies abreast of activities by informal meetings as the selection process progressed.

8.1.3.3 Phase III - Reconnaissance and Evaluation. The initial elements of Phase III consisted of a comparative assessment process in which the 22 potential sites were evaluated from published technical data (topographic, photographic, demographic and geophysical) until the sites were either rejected (with justification), or given candidate status.

The initial effort was to identify five to ten candidate sites prior to field reconnaissance. To assist in reaching this point, a qualified biologist was consulted to characterize the environmental acceptability of the potential sites in rather general terms. The latest available U.S. Geological Survey 7-1/2 minute topographic maps were utilized, and current aerial photographs were obtained and analyzed. The available cooling, process, and potable water sources were identified. Present and planned land uses were determined from published data, or conversation with knowledgeable agencies (county planners, regional planning councils, etc.). Eight potential sites were assigned "tentative" candidate site status.

Field reconnaissance by fixed wing aircraft overflights was initiated. Current residential development at one site and agricultural production (of a secondary nature) at two other sites were discovered. These sites were placed low on the "tentative" list.

At this point, the environmentally attractive constraint of utilizing sewage treatment plant effluent for cooling tower makeup was applied, eliminating the three most distant sites, leaving five. (Coincidentally, those eliminated were the same three mentioned above.)

More overflights were conducted; each site was visited and traveled via jeep trails and on foot (by OUC personnel, environmental and engineering consultants); geological and hydrological data was thoroughly researched; representatives of the appropriate agencies within the political subdivisions involved were contacted and discussions held; and the state

regulatory agencies were again contacted (under the auspices of the Department of Environmental Regulation, Power Plant Siting Section of the Bureau of Permitting).

The common difficulty in power plant siting activities is that one or more otherwise promising candidates must be rejected in the interest of practical objectivity. This study was no exception, having gone through several such iterations just to arrive at the final list of candidates. The rigorous application of prudence in judgment reduced the tentative list to four at one point. This challenged the committee to research the more favorably characterized potential sites and select another to assure a reasonably broad spectrum of acceptable candidates for inclusion in the ranking process.

The final evaluation of the resulting list was an integrated analysis of the consequential factors relative to siting (both objective and subjective) which, when weighted by importance and graded, gave a common base score. The end product was a ranking of the candidate sites in order of preference: (Figure 8.1-8).

<u>Candidate Zone</u>	<u>Potential Site</u>	<u>Geographic Reference</u>
20	A	Econlockhatchee South
3	A	Southeast Orange County
1	C	Lake Harney Southeast
19	A	Econlockhatchee North
2	A	Shingle Creek

8.1.3.4 Phase IV - Final Report. Phase IV was basically the narrative and graphic production effort required to yield the final report. It is viewed as a communication tool which will support the implementation of the Orlando Utilities Commission's 1986 coal project.

8.1.4 Plant Requirements

8.1.4.1 General. The four subjects under this section were treated to the degree required to assure a reasonably accurate determination of the relative influence of each on site selection.

8.1.4.2 Land Requirements. Acreage allocations for this project have been made conservatively, since the achievement of maximum effectiveness in both the environmental protection and power production systems design can substantially affect the land area requirements. Table 8.1-1 contains a preliminary estimate of site space requirements.

Variations in site acreage requirements will occur due to differences in coal fuel characteristics; site suitability for solid waste disposal; configuration of natural and man-made boundaries; etc.

The acreage shown for ash and sludge storage is based upon the use of coal with relatively favorable percentages of ash and sulfur. The use of high sulfur fuel and/or fuel with higher ash content could substantially increase the required storage area shown.

8.1.4.3 Water Requirements. During Phase III of the site selection study, OUC management, citing an anticipated growth of regulatory interest in conservation of water resources, suggested adoption of the limiting criteria of siting in an area where the use of sewage treatment plant effluent (STPE) as cooling water makeup is viable. It was further noted that though this had not previously been a formal constraint, thinking, in some measure, had been influenced by the advantages of utilizing STPE.

Management's direction to the Committee was to pursue informal discussions with the City of Orlando regarding use of STPE.

Informal discussions with the city centered around questions relative to using STPE which could affect siting (e.g., flow rates, surge capacities, cycle of operation, quality, constituents, withdrawal from river versus pipeline transmission, waste water return considerations).

The OUC design consultant was requested to provide conservatively oriented makeup water requirements based on the use of sewage treatment plant effluent for cooling applications. The resulting 8 million gallons per day per 400 MW unit (approximate), was based upon use of wet scrubber type air quality control facilities for SO₂ removal in connection with the burning of Wyoming and West Virginia coal fuels, as well as for plants designed to operate using Illinois fuel. Current expected water usage for the facility as designed would average about 4 million gallons per day for Unit 1.

The quantities computed in connection with application of wet scrubber removal systems for Wyoming and West Virginia coal-fired plant units represent the probable maximum requirements, and therefore were conservative regardless of the system utilized. Later conceptual design studies have established wet scrubbers as most suited for the proposed plant.

Potable and boiler makeup requirements will be about 0.4 million gallons per day for each 400 MW unit and will come from deep wells.

8.1.4.4 Fuel Source and Transportation. A rather extensive coal supply study was performed by the consultant, Black & Veatch, in support of this and the Lakeland project. A brief summary of the more significant considerations during this siting study follows.

The primary domestic coal resources available to the Orlando Utilities Commission are the Southern Appalachian Basin (East Kentucky, Southern West Virginia, Virginia, Tennessee, Alabama, and Georgia) and the Illinois Basin (Illinois, Indiana, and West Kentucky). Secondary coal sources include the lignite fields in the Gulf Coal Province (Alabama, Mississippi, Arkansas, Louisiana, and Texas) and the coals from the San Juan Basin of New Mexico. Due to the recent increases in long haul unit coal train tariff rates, and their low heating value, coals of Wyoming and Montana are not competitive at an inland Florida site.

All coal shipments will probably be received by rail. If bulk cargo ship deliveries to Port Canaveral are possible, the short distance (about 30 miles) could make truck delivery economically competitive with rail.

The environmental impact caused by a significant number of truck movements would be the subject of a rather thorough investigation prior to commitment to such an option.

All rail movements could originate from each of the domestic coal producing regions except the San Juan Basin, which would be cost prohibitive. The Illinois Basin and the Alabama portion of the Southern Appalachian Basin offer the potential of low cost barge transportation down the Ohio and Mississippi River systems to New Orleans or the Black Warrior River system to Mobile, Alabama.

At the present time, there are only two large facilities receiving coal shipments by ocean-going barge in the state of Florida. These facilities are located at Tampa Bay (Tampa Electric Company) and Crystal River (Florida Power Corporation). Facilities have been proposed for Jacksonville, Port Canaveral, Ft. Pierce, and Port Manatee. These projects have received media coverage and do offer some promise. Their present status, however, is somewhat indeterminate.

Rail service to the area is by the Florida East Coast (FEC) Jacksonville to Miami main line, following generally the Atlantic shoreline, and by the Seaboard Coast Line (SCL) Jacksonville to Orlando and Tampa main line, passing to the west of the region. Both lines are strong with present trackage and signaling adequate for unit train service.

The rail spur serving the Econlockhatchee South site (Site 20A) from the FEC System would branch from the main line at a point to the west of the Indian River plant and run directly west on the north side of the existing Indian River-Orlando transmission line corridor. The routing would parallel this corridor to the east edge of the plant site. Rail spur service from the SCL system would branch from the SCL main line at a point about 3 miles south of Taft and run easterly, skirting the south boundary of Orlando International Airport and associated residential-commercial development. The routing would generally parallel the Bee Line Expressway to a point directly south of the site. At this point, the routing would turn north and, crossing the expressway, run to the site.

Alternative rail spur alignments branching from the existing SCL trackage at Oviedo and running south to the sites were examined and rejected in favor of the above alignment. The condition of the 17-mile Sanford to Oviedo branch line is unsuitable for the heavy loadings imposed by unit coal train service. This line would require extensive reconstruction and upgrading, which is not cost effective as measured against the cost of the base alignment.

Use of a coal slurry pipeline is now being proposed which would connect the coal fields of east Kentucky and West Virginia with several Florida utilities. Such pipelines are very capital intensive and their competitive position with rail movements is contingent on long distances (greater than 500 miles) and large annual volumes (greater than 5 million tons). Aside from economic considerations, flexibility in selection of future coal suppliers is limited. Slurry pipeline transportation is a "family affair" in which the coal producers, consumers, and pipeline owner/operator must agree to work together over a long period of time. Due to the small size of the coal shipped (less than 1/16-inch top size) via slurry pipelines, dewatering and storage can present operating problems. One of the primary claims for the slurry pipeline has been its low escalation rate compared to rail transportation. Now that the capital markets are receiving interest premiums due to inflationary expectations, the economic benefits may not be as great as they were a few years ago, when interest rates were lower.

8.1.4.5 Transmission. An adequate reliable electric transmission system is a necessary part of any large central station generating facility. While generally not the leading consideration in a site study, planning associated with the siting of large generating plants must include an assessment of the effects of the new plant on the existing and planned transmission network and an evaluation of alternative plans for addition of transmission facilities associated with the project.

The Orlando Utilities Commission is a member of the Florida Electric Power Coordinating Group (FCG), a voluntary association of Florida utilities.

The FCG, working through member committees, coordinates planning and operating functions as an aid in providing adequate reliable power supply to the state. They further sponsor independent studies aimed at solving common problems and achieving common goals within the Florida utility industry. Additionally, OUC is a member of the Florida Subregion of the Southeastern Electric Reliability Council (SERC) a regional electric reliability council.

Transmission lines in the Florida Subregion used principally for bulk power are 230 kV. In recent years, however, several 500 kV lines have been constructed and several more are included in long range plans for the region. The existing OUC bulk power transmission system includes lines operating at 115 kV and 230 kV. The 115 kV lines basically form a network and supply distribution substations in the Orlando area. The 230 kV lines are used to bring power into the Orlando area and to tie major source substations to provide increased system reliability. The lines are all overhead with the exception of some pipe type and extruded dielectric cables in the 115 kV network.

The OUC 230 kV bulk power transmission system includes interconnections with Florida Power Corporation at three points and with Florida Power and Light Company at one point. This system also includes a recently energized tie with Kissimmee at Taft and one with Lakeland scheduled for 1981 construction.

The Econlockhatchee South site is located adjacent to the existing OUC transmission line corridor between the Indian River plant and Pershing substation. The site is approximately 5 miles west of the existing Florida Power and Light Company, 230 kV Brevard-Sanford transmission line.

8.1.5 Environmental Considerations

Environmental considerations were a predominant factor from initiation to completion of the site selection process. Phase I of the siting project concentrated on developing a comprehensive listing of environmentally sensitive areas so that they might be excluded from consideration, and the

"Public Acceptance" factor has a strong implication of environmental acceptability. An early decision of the Siting Committee was to provide a large area for plant development to assure environmentally compatible land uses.

Field reconnaissance of the 22 sites identified during the study concentrated heavily on environmental assessment and extended the information obtained from topographic maps and aerial photographs. Criteria applied included the amount of wetland present, the amount of forested areas and cypress domes that would be affected, the proximity to sensitive wildlife areas, the distance to population concentrations, the availability of a water source, the distance to adequate transportation facilities, and the presence of any known archaeological sites or other cultural resources.

As a result of the evaluations, five sites were identified to be environmentally acceptable in addition to satisfying other site selection factors. Certainly, many of the other sites could be utilized as a power plant site, but environmental impacts would have been greater on a comparative basis.

The decision to utilize sewage treatment plant effluent as a source of cooling water was made predominantly on an environmental basis. The location of the preferred site, Econlockhatchee South, adjacent to the Orange County landfill operation is an environmental plus from a land use basis.

8.1.6 Evaluation and Ranking of Potential Sites

The objective of the ranking process was to evaluate each potential site until it was either rejected as a viable site or received a rank indicating its preferential order.

The methodology chosen by Orlando Utilities Commission (OUC) to accomplish this objective consisted of four steps.

The first step screened all potential sites using general broad based information. The purpose of this step was to eliminate those sites which did not offer some assurance of being acceptable to the regulating bodies and the general public.

The second step added the restraint of requiring the use of sewage treatment plant effluent for cooling water purposes.

The third step evaluated each remaining site in much more detail. This redefined all the criteria used in the first step more stringently. The purpose of this step was twofold: (1) Was the general evaluation in the first step so broad that a factor which would make the site unacceptable overlooked? (2) Additionally, what would be the preferential order of the remaining sites?

The fourth step weighted the various factors and components.

8.1.6.1 Step I - General Screening of Potential Sites. This screening evaluated each potential site based on the following criteria.

A. Water Supply - What would be the source of the primary water supply?

- (1) Salt Water - S
- (2) Surface Water - SF
- (3) Ground Water - G
- (4) Sewage Treatment

Plant Effluent -STPE

The initial restricting criteria would be that any site having ground water as the only water supply available would be unacceptable. This restriction was based on the general premise that ground water would be of high quality and to use that water for cooling purposes would not be the most beneficial use of that water supply.

B. Existing land use - What is the present primary land use characteristic?

- (1) Agriculture - AG
- (2) Residential Development - R
- (3) Open Land - O

The initial restricting criteria would be that if the present primary land use is agricultural, residential or a combination of these, the site would be unacceptable. This is because those

users would be considered to be a better beneficial use of the land than a power plant would be.

- C. Ecology - How would the construction of the plant, all necessary access lanes, and long term operation of the plant affect the ecosystems of the area?

These effects were determined as the result of analytical judgments concerning the impact on the terrestrial and aquatic ecosystems for each site, and both ecosystems as they relate to site accessibility.

The judgment scale was as follows.

Acceptable - Construction and operation would not be unduly harmful.

Marginal - Effects of construction and operation are unclear.

Unacceptable - Construction and operation would be unduly harmful.

The restricting criteria would be that if any site receives an unacceptable rating for terrestrial ecosystems, aquatic ecosystems or accessibility, the site would be unacceptable. In addition, any site which received two marginal ratings would be unacceptable.

The results of Step I are shown on Table 8.1-2. This step determined sites 1A, 1B, 1D, 1E, 2B, 3B, 4A, 4B, 5A, 7A, 8A, 8B, 10A, 17A and 18A to be unacceptable.

8.1.6.2 Step II - Cooling Water Constraints. The initial screening was an overview of all potential sites with only general restrictions. At this time, the specific restriction that the plant utilize sewage treatment plant effluent for cooling water was imposed. This constraint was imposed primarily because it is environmentally sound and is an effective form of resource recovery.

Secondly, it may benefit the regional waste treatment facility by reducing the volume of its effluent discharge. Secondary treatment may

provide adequate quality for power plant cooling water makeup. In addition, it may benefit the sewage plant by reducing volumes of wastewater to be treated at certain stages and by reducing effluent flow. Even with this constraint, five potential sites remain, indicating it to be not unduly restrictive.

Reviewing Table 8.1-2 shows that this constraint makes sites 6A and 16A unacceptable.

8.1.6.3 Step III - Screening of Remaining Sites. In previous steps, the thrust of screening was to determine if there were any general reasons why a site should be rejected. This step evaluated each remaining site in depth to determine if there were any previously overlooked reasons to reject a site, as well as to quantify each of the factors used in determining the preferential order of remaining sites.

The factors quantified were as follows:

(1) Technical/Economic

Because all remaining sites are within a 20 mile radius, it was assumed that operational costs will not significantly vary. It was also assumed that there will be no significant difference in plant design or equipment. This means the only variable to be considered was the cost of fully developing each site to its maximum potential. All cost estimates have been developed by Black & Veatch based on 1979 dollars, which were then escalated at an average rate of 8 per cent per year. Using the least expensive site as a base and relating all other sites to it, each site was assigned a numerical value between 0 and 100. The best site, i.e., least expensive, is the site with the highest value assigned to it.

(2) Hydrology

(a) Water Supply - Potable and plant service water requirements will be 0.4 million gallons per day and will be taken from the Floridan Aquifer. It is assumed that this is not a site specific variable. Other water use (non-potable) will be eight (8) to twenty four (24) million gallons per day. This

will be sewage treatment plant effluent. Because the point of supply for potable and non-potable water is the same for all potential sites, the only aspect of water supply which will vary by site is cost, which is considered under the technical/economic factor.

- (b) Water Quality - It was assumed that all wastes would be returned to the sewage plant. Therefore, this factor becomes a function of the potential to degrade ground or surface waters. The degradation of ground water could occur from the leachate which would come from the coal pile and solid waste disposal areas. It is assumed that all sites would be designed to protect against this leaching and therefore, it would not be a site variable. Surface waters could be degraded by contaminated ground water, storm water runoff, or flood runoff. Ground water would be protected, as previously discussed. Storm water runoff from contaminated areas will be collected and treated. This leaves flood runoff as the potential source of degrading the surface waters. The flood potential can be quantified by measurement of the land area which would be inundated by a 100-year flood. This does not consider areas which have standing water after a heavy rain. Such areas of standing water will either percolate into the ground as a non-contaminate, or, if in an area with contaminates, such as the coal pile, it will be collected and treated. A numerical value between 0 and 100 was assigned by equating the site with zero flood potential equal to 100, and letting any site with 25 per cent or more of its land area susceptible to flooding equal 0. The other sites are ranked linearly between those bounds.

(3) Geology

- (a) General - All sites have the same basic geology and sub-surface conditions which, though not exactly identical, are not significant site variables.

(b) Seismology - Seismic risk design criteria for a coal-fired plant is based on the Uniform Building Code (UBC). The UBC includes Florida in its seismic Zone 0, indicating no seismic damage would be expected and, it is therefore not a site specific variable.

(4) Air Quality

Under existing regulatory requirements, air quality will not be allowed to be significantly degraded. Therefore, this would not be site specific in any tangible way. There is an intangible consideration which is the potential impact which can be quantified by the distance from the center of the site to the nearest edge of the nearest urban or environmentally sensitive area. A numerical value between 0 and 100 was assigned by equating a distance of 0 miles to 0, and 5 or more miles to 100, and ranking the other sites linearly between these bounds.

(5) Land Use

Existing land use was considered in the general screening of all sites and was grounds for site rejection. The purpose of this procedure was to determine the future land use around each site. The best site would be the one determined to have the least growth around it. This can be given a numerical value by rating the sites subjectively for the possibility of being in areas expected to be developed within 10 years. Ratings were assigned as follows.

<u>Development Level in Ten Years</u>	<u>Value</u>
Fully	25
75 per cent	50
50 per cent	75
25 per cent or less	100

(6) Archaeological

It was assumed that there are no major areas of archaeological significance on any of the sites. So this was not a site specific variable. It should be noted that this assumption was based on the idea that if any such areas are found, they could be studied and documented or the plant could be built there without disturbing them.

(7) Socio-Economic

This was a function of the short term impact on an area due to the influx of large construction forces and then long term operating personnel. This was site specific to some degree and was measured by the distance to labor forces and the ability of the area to absorb the additional permanent population. The best site would be within commuting distance for both construction and operating forces. Because all potential sites are within 25 miles of Orlando, it was anticipated that construction forces would not impact the area. In addition, the growth from other sources in central Florida is such that the additional people required to staff the site would have a negligible effect on that growth.

(8) Ecosystems

(a) Terrestrial Ecosystems - This was site specific and related to existing habitat. The best site would be land covered with only scrub pines and palmettos. The worst would be an area heavily forested with mixed hardwoods and cypress domes.

(b) Aquatic Ecosystems - This was site specific and related to existing wetlands. The best site would be high and dry and the worst would have large areas which are normally wet. Both of these criteria have been assigned a numerical value with the rating being from the standpoint of the site being adaptable to the facility.

<u>Rate</u>	<u>Value</u>
Excellent	100
Good	80
Fair	60
Poor	40
Marginal	20

(9) General Site Acceptability

This is site specific and is more intuitive than objective. It cannot be quantitatively measured but very definitely provides an accurate summary of the intuitive judgments of the committee members. These judgments were made by those most closely associated with the project, and most able to sense and assess the attitudes and opinions of all the entities that will participate in the final determination of site acceptability. There were some specific considerations which influenced these judgments. For example, the Shingle Creek site would be visible from Sea World and other area attractions, as well as from the major highways which carry the majority of the tourists visiting the area. The plant would become one of the first impressions people would get of the area, and in a tourist oriented economy that cannot be ignored. Another example is that both Econlockhatchee sites are close to the Orange County landfill. While refuse burning is not presently planned for the first unit, growth and development of refuse burning technology is expected to make this fuel source economically viable and significant by the time future units are added. The base data and raw score for each factor derived as discussed in this step is shown on Table 8.1-3 and Table 8.1-4.

8.1.6.4 Step IV - Weighting of Components. There are two major components considered in the weighting process. They are the cost component, i.e. technical/economic, and the environmental component, which consists of all the other factors.

Each major component is assigned a value of 100, with the environmental factors assigned weights as follows.

Hydrology - Water Quality	5
Air Quality	15
Future Land Use	5
Ecology	
Terrestrial Ecosystems	25
Aquatic Ecosystems	25
General Site Acceptability	<u>25</u>
Environmental Total	100

The weight assigned to the hydrology factor was small because existing technology and prudent design will minimize any potential impact.

The air quality factor was assigned a higher weight because emission control is constantly changing with the development of new technologies.

The weight assigned to the future land use factor was small because development in the site areas is not presently encouraged by the counties. In addition, it is OUC's intent to have a large enough site to provide a buffer zone between the actual plant facilities and any potential development.

The terrestrial and aquatic ecosystems were assigned high weight values because most of the ecosystems present will be disturbed. Since this is undesirable, they carry more weight. General site acceptability is assigned a high weight because it represents a summary of the difficult-to-quantify yet highly-significant factors in the siting process. The results of this work are shown on Table 8.1-5.

The raw score values come from Table 8.1-4, with the adjusted score being the assigned weight times the raw score. The final weighting compares the value of the technical/economic component to the value of the environmental component. To do this, a sensitivity analysis was prepared, shown on Table 8.1-6. This analysis indicated that varying the weights from 40 percent technical/economic and 60 per cent environmental, to 60 per

cent technical/economic and 40 per cent environmental, does not change the relative ranking of the sites.

Therefore, the sites listed in the order of preference are as follows.

- (1) Econlockhatchee South
- (2) Southeast Orange County
- (3) Lake Harney Southeast
- (4) Econlockhatchee North
- (5) Shingle Creek

8.1.7 Candidate Site Profiles

These descriptive profiles capsulize the more significant features of the five candidate sites. Where appropriate, each subject addressed has been treated in greater detail in other sections of this study. This section is designed to give a concise, but comprehensive overview of each candidate site.

The topography of the five candidate sites and vicinities is shown on Figure 8.1-9 through 8.1-13 which are based on portions of USGS topographic quadrangle maps at a scale of 1:24,000.

8.1.7.1 Econlockhatchee South - Site 20A

<u>Item</u>	<u>Description</u>
Nearest Town:	Union Park
Surface Waters:	Econlockhatchee River
USGS 1:24,000 map:	Narcoossee Northwest
Range & Township:	R31E, T23S R32E, T23S (Orange County)
Water Supply:	
Cooling:	Sewage treatment plant effluent (Approximately 12 miles away)
Process & Potable:	Floridan Aquifer
Fuel Transportation:	Two rail routes appear feasible: from the Florida East Coast Railroad (FEC) branching to the west in

Item

Description

Highways:

Transmission Lines:

Geophysical:

Land Use:

the vicinity of the Indian River Plant and extending across the St. John's River along the existing transmission corridor; and from the Seaboard Coast Line Railroad (SCL) by extending east out of Taft, then north to the site, crossing SR 528.

SR 528 (Beeline Expressway) is about 1 mile south of and parallel to the south boundary of this site. SR 50 is approximately 5 miles north. SR 15A is roughly 7 miles west and SR 520 is about 9 miles east.

The Econlockhatchee South site is located adjacent to the existing OUC transmission line corridor between the Indian River Plant and Pershing Substation. The site is approximately 5 miles west of the existing Florida Power & Light Company 230 kV Brevard-Sanford transmission line.

Sloping from a maximum elevation of 90 feet in the southwest to 45 feet (at the Econlockhatchee River) in the northeast corner, this site has the greatest elevation change of the candidates. Sinkholes were less numerous on this site than the others. The water table, as with the other east Orange County sites, is within 5 feet of the ground surface. The Upper Floridan Aquifer is estimated to be 250 feet below the surface. Bedrock consisting of the Ocala Group Limestone is at the 275 to 300 foot depth sloping to the southeast.

This area has been used as livestock range. A half section and an adjacent quarter section on the western edge of this site and joining the Orange County Solid Waste Disposal area has been platted into residential lots, but not recorded.

Item

Description

Demography:

There is no development on these lots or any other portion of the site. Hunters' stands were noted at two or three locations on the site. The future possibility of resource recovery through refuse derived fuel lends significance to the fact that the closest active neighbor (as mentioned above), is the Orange County Solid Waste Disposal Facility. Situated about 15 miles east and slightly south of downtown Orlando, this site is fairly well removed from population centers. The closest rural roads extending south of SR 50 between Bithlo and Union Park terminate around 3 miles from the site. To the south lies the Deseret Ranch. Cape Orlando is on the east side of the Econlockhatchee River and 3 to 5 miles away. Orlando International Airport is approximately 6 miles to the southwest.

Exclusion Areas:

Designated urban development associated with the City of Orlando is the closest exclusion area and is 7 to 8 miles away. (Florida Department of Transportation designation.)

Ecosystems:

Terrestrial Habitats:

Pine Flatwoods:

Pine flatwoods comprise the largest vegetation association on the site. These are relatively flat areas dotted primarily with long-leaf pine and an understory of saw-palmetto, wax myrtle, gallberry, cordgrass, wire grass, and other grasses. Oak saplings (live, water, and laurel) also occur in these areas.

There is evidence that fires have occurred in portions of the pine flatwood areas. Additional disturbance has occurred by the passage of vehicles

Item

Description

through the site. Survey markers also are visible through sections of site, and a very limited amount of clearing of vegetation has been carried out.

Pine flatwoods provide moderate quality habitat utilized primarily by small mammals, several species of reptiles and amphibians, and some birds. A list of vertebrates potentially found in a pine flatwood habitat is given in Table 8.1-7.

Cypress Domes and Strands:

There are a number of cypress domes and strands in low, wet areas on the site. These dome communities are underlined with an impervious clay lens or pan which retains water within the confined area of the dome. A rounded dome appearance results because taller cypress trees occur in the center with progressively smaller trees radiating toward the perimeter. Pond cypress characteristically occurs in the center of the domes as well as in strands along wet areas. Other species of flora commonly associated with the domes included wax myrtle, black gum, slash pine, common buttonbush, sweet bay, red maple, longleaf pine, holly, saw grass, and pickerelweed.

Cypress domes and strands represent a rather unique and valuable habitat. They are a combination of terrestrial and aquatic habitat which attract and support a variety of land birds, waterfowl, small mammals, reptiles and amphibians.

Item

Description

Mixed Cypress -
Hardwood Swamps:

These areas, consisting of a mixture of cypress and hardwoods such as oaks, maples and gums, are found mainly along several small streams and drainage ditches which are on the site. Small isolated depressed areas which predominately have strands of hardwoods around and in them with an occasional cypress in the wetter interior are also present.

These areas provide very productive habitats which are utilized by diverse species of wildlife. The hardwoods supply food in the form of nuts and acorns for a variety of birds and mammals. Deer also utilize this type of habitat, as well as the alligator, raccoon, and opossum. The wet areas of this association are used by ducks, wading birds, and various other waterfowl.

Leaves and other plant materials that fall into the water serve as an energy source for the growth of plankton, insects, snails, and minnows, which in turn support populations of fish, reptiles, amphibians, birds and mammals.

Mixed cypress - hardwood swamp areas represent a very high quality habitat which is utilized by a wide diversity of wildlife, and is an important component of the natural food chain.

Freshwater Marshes: These are wet areas largely covered by grasses, rushes, and sedges. There are a number of freshwater marshes scattered over the site. Maiden-cane, cordgrass, and pickerelweed are common in these areas. Waterlilies and bladderworts also are present. Various shrubs and vines grow around the drier edges of the marshes, such as cattails,

Item

Description

buttonbush, swamp loosestrife, and others. Bulrush, rushes, and saw-grass are also present.

Freshwater marshes are important as natural water purification systems. Water runoff from soils and rocks often has elevated concentrations of minerals and possibly organic material. Plants growing in marshes where the runoff collects remove most of the minerals and organic materials before the water returns to the ground water.

This type of habitat primarily is utilized by a variety of wading birds, reptiles, and amphibians. It does not support as great a diversity of species of wildlife as wooded areas.

Aquatic Habitat:

There are several small streams on the site which provide limited aquatic habitat. Minnows were observed in these streams, and the water is utilized by snakes, frogs, and other reptiles and amphibians. Plankton and benthic organisms grow in such streams and provide an important link in the food chain. Drainage ditches on the site also represent a type of aquatic habitat.

The most significant aquatic habitats on the site are the swamps, freshwater marshes, and cypress dome areas. These areas are a combination of aquatic and terrestrial habitat. The growth of plankton and other aquatic organisms occur in these habitats which are essential food sources for other organisms. There does not appear to be any aquatic habitat on the site capable of supporting a significant fishery. The Econlockhatchee River and the Hart Branch and Cowpen Branch tributaries are located east of the site. The Wide

<u>Item</u>	<u>Description</u>
	Cypress Swamp is west of the site. These areas contain the most extensive aquatic habitat in the vicinity of the site.
Environmental Quality:	The highest quality and most productive habitats on the site are the heavily wooded swamp areas, the freshwater marshes, and the cypress domes. There is not an excessive amount of any of these habitats on the site. Within the state of Florida, virtually any candidate site would contain one or more of these habitats. The environmentally sensitive areas associated with the Wide Cypress Swamp and the Econlockhatchee River have been avoided.

8.1.7.2 Southeast Orange County - Site 3A

<u>Item</u>	<u>Description</u>
Nearest Town:	Cocoa
Surface Waters:	Second Creek, Jim Creek
USGS 1:24,000 Maps:	Narcoossee Northeast, Lake Poinsett Northwest
Range and Township:	R33E, T24S
Water Supply:	
Cooling:	Sewage treatment plant effluent (approximately 24 miles away)
Process & Potable:	Floridan Aquifer
Fuel Transportation:	Service from FEC railway could originate in the vicinity of the Indian River Plant following the existing transmission line right-of-way across the St. John's River, then turn south. This, in addition to the river crossing would require crossing SR 520 and SR 528. A less encumbered route would be an extension of the SCL east out of Taft, although more trackage would be required.

<u>Item</u>	<u>Description</u>
Highways:	SR 528 (Beeline Expressway), parallels the north boundary of this site about 2 miles to the north. SR 520 and the southern extension of SR 528 into Cocoa are approximately 5 miles to the east.
Transmission Lines:	The Southeast Orange County site is located approximately 7 miles south of the existing OUC transmission line corridor between the Indian River Plant and Pershing Substation, and approximately 16 miles east of the existing OUC 230 kV Taft-Pershing transmission line. This site is approximately 3 miles southwest of the existing Florida Power and Light 230 kV Brevard-Sanford transmission line.
Geophysical:	Geologically, this site and Econlockhatchee North and South are approximately equivalent, each being situated 275 to 300 feet above the Ocala Group Limestone bedrock with quite similar surficial deposits. Several secondary artesian aquifers from 60 to 150 foot depths would typify ground water conditions with the Upper Floridan Aquifer at about 250 feet. The water table will be around 5 feet below surface level. This site slopes quite gently to the east, generally, with some drainage to the north into Second Creek. The site is relatively high (average elevation approximately 67 feet MSL). Much more rapid elevation changes begin about 1 to 2 miles east of the site. Second and Jim Creeks join about 3-1/2 miles to the northeast flowing to the St. John's River marsh near the Beeline-SR 520 intersection. A number of sinkholes were noted on this site. Flat, open rangeland predominates this site. Clearing requirements could be minimized.

<u>Item</u>	<u>Description</u>
Land Use:	This site is on and totally surrounded by Deseret Ranch properties. It is presently being used as rangeland. About 3 miles west of the site, the City of Cocoa draws part of its water supply from deep wells. This site is the most remote of the candidates and also approximates one of the locations identified by Florida Power Corporation as a possible power plant site. (10 year site plan, 1979).
Demography:	Other than a few scattered farm residents about 5 miles to the northeast, the closest population centers are Christmas, approximately 8-1/2 miles to the north and Cape Orlando (Rocket City) about 7 miles to the north and slightly west. The site is 17 miles from Cocoa (population, approximately 17,000) and 25 miles from downtown Orlando.
Exclusion Areas:	The only exclusion area in the vicinity of this site is the Tosohatchee State Preserve, the closest approach of which is approximately 4 miles from the site.
Ecosystems:	
Terrestrial Habitats:	
Pine Flatwoods:	Pine flatwoods occur throughout most of the site. The composition of this association is the same as described for the Econlockhatchee South site. Armadillo, quail, and deer were observed in these areas. A list of vertebrates occurring in pine flatwoods is given in Table 8.1-7.

<u>Item</u>	<u>Description</u>
Cypress Domes and Strands:	There are a number of cypress domes and strands on this site. They vary in size from over an acre to a few hundred square feet. Very dense growths of

Item

Description

longleaf pines occur in the drier areas of some of the domes. These areas appeared to be good habitats for a variety of wildlife species. Vertebrates associated with this type of habitat are listed in Table 8.1-7.

Mixed Cypress -
Hardwood Swamps:

There are very dense stands of mixed cypress-hardwoods in the wet areas along Second Creek and associated tributaries on the site. These are high quality habitats which support a wide diversity of wildlife species. Numerous deer tracks were observed in these areas. Smaller mammals, a variety of reptiles and amphibians, and numerous species of birds also are found in this type of habitat. Table 8.1-7 contains a list of vertebrates known to inhabit these areas.

Freshwater Marshes:

There are a number of freshwater marshes on this site, particularly in the southwestern portion. These areas are important habitats for wading birds, frogs, snakes, alligators, and various small mammals. Little blue heron were observed in one marsh on the site. Vertebrates associated with this type of habitat are listed in Table 8.1-7.

Ruderal:

Ruderal areas are those areas that have been disturbed by agricultural, commercial, or urban activities. There are two ruderal areas on this site.

One is an abandoned railroad that runs from the southwest to the northeast diagonally across the site. The right-of-way has been cleared and wooden ties remain in some sections. Bare areas of sandy soil are evident along much of the rail route. Saw palmetto, gallberry, and oak saplings

Item

Description

flank most of the cleared corridor. The old railroad route represents only a small percentage of total habitat on the site. Small mammals, a few reptiles and amphibians, and some species of birds probably utilize the area.

The second ruderal area is a cleared fence line corridor which extends north and south across the site. This cleared corridor passes through some heavily wooded areas as well as pine flatwoods. This cleared corridor probably is utilized by wildlife more than the abandoned railroad route because there is a greater diversity of floral species. A list of vertebrates that utilize ruderal habitats is given in Table 8.1-7.

Aquatic Habitats:

Second Creek and several small tributaries provide some aquatic habitats on the site. These are rather small bodies of water, but they support the growth of microscopic aquatic organisms, benthic organisms, and a few species of fish. Minnows were observed in the streams. Frogs, snakes, and small mammals also use these streams, as well as various species of bird.

The marshes, swamp areas, and cypress domes also provide aquatic habitat on the site.

Item

Description

Environmental
Quality:

The wetland areas and associated wooded areas provide high quality habitat. This site supports a variety of wildlife as evidenced by the observation of deer, quail, wading birds, and armadillo. The habitat on the site has experienced some disruption by the construction and operation of the railroad. The corridor was cleared of vegetation,

<u>Item</u>	<u>Description</u>
	and many stumps remain on the site where trees were cut during logging operations.
	Other habitat has been disturbed by the cleared fence line corridor.

8.1.7.3 Lake Harney Southeast - Site 1C

<u>Item</u>	<u>Description</u>
Nearest Town:	Geneva
Surface Waters:	Lake Harney, St. Johns River
USGS 1:24,000 Maps:	Geneva
Range and Township:	R30E, T20S (Volusia County)
Water Supply:	
Cooling:	Sewage treatment plant effluent (Approximately 19 miles away)
Process & Potable:	Floridan Aquifer
Fuel Transportation:	A recently abandoned railroad bed is about 6 miles north of this site (rails have been removed). Rebuilding this abandoned route and then extending it into the site would be the most likely approach. Service could be obtained either from Florida East Coast out of Edgewater or the Seaboard Coastline system out of Enterprise.
Highways:	Florida SR 46 is within one-half mile of the southern portion of this site, and intersects Interstate 95 at Mims, approximately 10 miles to the east.
Transmission Lines:	The Lake Harney site is located approximately 15 miles north of the existing OUC transmission line corridor that connects the OUC Indian River Plant and Pershing Substations, and is approximately 20 miles northeast from the OUC Azalea

<u>Item</u>	<u>Description</u>
Geophysical:	substation. The existing Florida Power and Light Company 230 kV Kennedy-Volusia transmission line is located approximately 5 miles east of the site. This rather flat candidate site is 10 to 15 feet above Lake Harney to the southeast. Several sinkholes were noted. The site slopes gently to the west (towards Lake Harney). Bedrock is 75 to 100 feet deep (Avon Park Limestone) and dips to the east. The water table is probably less than 5 feet below surface level.
Land Use:	The western edge of this site has several acres of citrus which could, for the most part, be avoided by construction, and leased back. The major portion of this site is open rangeland. Very few livestock were noted during a site visit. Several hunters' stands were noted in lightly wooded areas. Two ranch residences were noted near the southeast portion of this site. Lake Harney supports moderate recreational use. A number of recreational type cottages and some permanent residences exist on the southwest shore of the lake. The taller structures of the plant would be visible from the lakeshore and SR 46.
Demography:	Geneva, about 6 miles away and across Lake Harney is the closest of several small agriculturally based communities (Geneva, Snow Hill, Chuluota, Mims, Scottsmeer), located around the site. Populations range up to around 1,500. The site is about halfway (15 miles), between Titusville (Pop. 32,000) and Sanford (Pop. 23,000), and about 25 miles from downtown Orlando.

Item

Description

Exclusion Areas:

The only exclusion area in the site vicinity is the Farmton Wildlife Management Area to the north and east of the site and about a mile away at the closest point.

Ecosystems:

Terrestrial Habitats:

Pine Flatwoods:

There are extensive areas of pine flatwoods on the site. The understory of saw palmetto, wax myrtle, grasses, and other plants is very dense in many areas. There are only a few wet areas scattered through the pine flatwoods. Two wild turkeys were observed adjacent to a dirt road in the flatwoods. A large nest was observed in a dead pine tree. It is not certain what species of birds used the nest. Because of the proximity of the site to Lake Harney and St. Johns River, a rather broad diversity of bird species are probably attracted to the vicinity.

Cypress Domes and Strands:

Several cypress domes and strands were observed on the site. These communities were not extensive, but they represent high quality habitat.

Mixed Cypress - Hardwood Swamps:

There are several drainage ditches on the site which have associated mixed cypress-hardwood swamp areas. In some sections, there are very dense stands of hardwoods. These areas are high quality habitat.

Freshwater Marshes:

A few marsh areas are evident on the site. These areas are covered with cordgrass, maidencane, pickerelweed and other grasses, rushes and sedges. Most of the freshwater marshes are interfaced with pine flatwood communities. A little blue heron

ItemDescription

was observed in a marsh on the site. These marshes provide valuable habitat and serve as a natural water purification system.

Aquatic Habitat:

There is a good flow of water in the drainage ditches on the site. Limited aquatic habitat is provided by the ditches. Minnows were not seen in the ditch waters.

More productive aquatic habitat is associated with the freshwater marshes, cypress domes, and swamp areas. Populations of plankton and other aquatic organisms develop which are important as food sources for larger life forms. St. Johns River and Lake Harney are major aquatic habitats in the vicinity of the site.

Environmental
Quality:

The heavily wooded swamp areas and freshwater marshes are the most significant and productive habitat on the site. The rather extensive pine flatwoods provide a larger, but less valuable habitat. The wetlands and drainage ditches constitute a rather minor aquatic habitat.

8.1.7.4 Econlockhatchee North--Site 19AItemDescription

Nearest Town:

Union Park

Surface Waters:

Econlockhatchee River

USGS 1:24,000 maps:

Oviedo Southwest, Narcoossee Northwest

Range and Township:

R31E, T23S

R32E, T23S

Water Supply:

Cooling:

Sewage treatment plant effluent (approximately
10 miles away)

<u>Item</u>	<u>Description</u>
Process and Potable:	Floridan Aquifer
Fuel Transportation:	Since this site is situated immediately to the north of Site 20A, the rail routing options are the same as previously described for that site.
Highways:	SR 50 is about 3-1/2 miles to the north. SR 528 (Beeline Expressway) is approximately 4-1/2 miles to the south.
Transmission Lines:	Transmission considerations are the same as for Econlockhatchee South (20A). The Econlockhatchee North site is located adjacent to the existing OUC transmission line corridor that connects the OUC Indian River Plant and Pershing Substations. It is located approximately 20 miles southeast from the OUC Azalea Substation. The site is approximately 4 miles west of the existing Florida Power & Light Company 230 kV Brevard-Sanford transmission line.
Geophysical:	This site is immediately north of the Econlockhatchee South site (20A), but differs to some degree in topography, being at generally lower elevations. An unnamed but significant tributary to the Econlockhatchee River meanders easterly across the site resulting in a somewhat more complex system of natural drainage. There are several rather large areas of relatively flat rangeland. Subsurface conditions are similar to the other east Orange County sites with the water table being less than five feet below the surface, Upper Floridan Aquifer around 250 feet, and bedrock in the 275 to 300 foot range.

<u>Item</u>	<u>Description</u>
Land Use:	Livestock range is the only known use of this area other than for seasonal hunting (some rather dilapidated small cabin type trailers were noted near the Econlockhatchee River tributary). Immediately northeast of the site are some citrus groves. The proximity of this site to the Orange County Landfill being nearly equivalent to that of Econlockhatchee South is a positive land use consideration factor. Adjacent to the transmission line right-of-way and on the southern portion of this site is a residential structure with several outbuildings.
Demography:	The only significant demographic difference between this site and Econlockhatchee South is this site's proximity to the SR 50 Union Park-Bithlo populace.
Exclusion Areas:	Designated urban areas east of Orlando (same as for Econlockhatchee South).
Ecosystems:	
Terrestrial Habitats:	
Pine Flatwoods:	Pine flatwoods are distributed throughout the site. The composition of the pine flatwoods is the same as described for the adjacent Econlockhatchee South site. These areas, however, are not as extensive as on the North site. The stands of saw-palmetto comprising the dominant component of the understory are particularly dense. The pine flatwoods provide habitat for a number of species of small mammals, reptiles, amphibians, and birds. A list of vertebrates that occur in this type of habitat is given in Table 8.1-7.

Item

Description

Cypress Domes
and Strands:

A number of cypress domes and strands were observed in low, wet areas on the site. A description of these is the same as given for the Econlockhatchee South site. Vertebrates found in this type of habitat are given in Table 8.1-7.

Mixed Cypress--
Hardwood Swamps:

There are very heavy stands of mixed cypress and hardwoods on this site. The areas generally are along the Econlockhatchee River and its tributaries on the site. These areas provide high quality habitat that supports a wide diversity of wildlife species. Deer, many small mammals, snakes and other reptiles, amphibians, and a variety of birds utilize this type of habitat. A list of vertebrates associated with this type of habitat is given in Table 8.1-7. There is significantly more cypress-hardwood habitat on this site than the adjacent site to the south.

Freshwater Marshes: There are extensive areas of freshwater marshes on this site. The marsh areas are more widespread than indicated on aerial photographs taken during March, 1970. These wet areas with growths of maidencane, cordgrass, pickerelweed, waterlilies, cattail, and associated vegetation are sensitive environmental areas. Habitat is provided for a diversity of wildlife species, including small mammals, wading birds, and other waterfowl. During a site visit, ducks were observed in a marsh. The freshwater marshes also are important in improving water quality before it returns to the groundwater system.

ItemDescription

Vertebrates common to freshwater marshes are listed in Table 8.1-7.

Aquatic Habitat:

The Econlockhatchee River and associated tributaries provide a major aquatic habitat on the site. These habitats support the growth of plankton, benthic organisms, and a few fish species. Minnows were observed in a tributary on the site. Deer, a variety of other animals, and birds are attracted to these areas. Young alligators were seen on the site in a tributary of the Econlockhatchee. The marsh, swamp, and cypress dome areas also provide aquatic habitat. These areas support the growth of plankton, other microorganisms, and a diversity of wildlife species.

Environmental
Quality:

The extensive freshwater marshes and mixed cypress-hardwood areas represent very productive and high quality habitat. Because of the many sensitive environmental areas on this site, any action which would adversely affect them should be carefully evaluated.

8.1.7.5 Shingle Creek--Site 2AItemDescription

Nearest Town:

Kissimmee

Surface Waters:

Shingle Creek

USGS 1:24,000 maps:

Kissimmee, Lake Jessamine

Range and Township:

R29E, T24S

Water Supply:

Cooling:

Sewage treatment plant effluent (approximately
30 miles away)

<u>Item</u>	<u>Description</u>
Process and Potable:	Floridan Aquifer
Fuel Transportation:	Seaboard Coastline's main line into Kissimmee would be the point of turnout into this site, near the southeast corner. This spur would cross U.S. 441, 17, 92, and SR 527. Other more distant routes (south of Kissimmee), are possible, but are unlikely to offer any offsetting advantage.
Highways:	This site is bounded on the east by U.S. Highways 441, 17, and 92, with the Florida Turnpike about one mile further to the east. Interstate 4 is about 5 miles west of the site. U.S. 192 is 4 miles south of the site, and SR 428's westerly extension is about 5 miles north.
Transmission Lines:	The Shingle Creek site is located adjacent to the existing OUC 230 kV Southwood-Taft-Pershing transmission line. The site is approximately 5 miles west of the new 230 kV Taft Substation and is adjacent to the 230 kV Taft-McIntosh line to be constructed in 1981.
Geophysical:	From a geophysical standpoint, this site offers some advantage over the other candidates. Excepting the rather rapid slope at Shingle Creek, this site is the most consistently flat of all. It is perched rather high (average elevation about 90 feet MSL), and the water table is 20 to 30 feet beneath the surface. Bedrock at this site (Avon Park Limestone) is 150 feet deep.
Land Use:	This area is presently in use as livestock range. There is some evidence that the central plain of this site (east of Shingle Creek) has, at one time, been under cultivation. A cabin apparently designed for recreational use was noted in the

Item

Description

forested area along Shingle Creek. A concern of plant aesthetics design would be the visual proximity of this site to major tourist attractions along Interstate 4, southwest of Orlando. Residential development in Orange County currently extends to within 2 miles of the site. The southern boundary of this site is also the Orange-Osceola County line. Commercial/industrial development in Osceola County presently extends to the county line. Development priorities would probably be more germane at this site than at the others.

Demography:

Perhaps one of the weaker attributes of this candidate is its proximity to existing population centers and its situation relative to future demographic development. Kissimmee is 3 miles to the south; Lake Buena Vista and Disney World are 6 miles west; Vineland is 5 miles northwest; Sea World is 3 miles north; and Taft is 5 miles northeast.

Exclusion Areas:

The closest exclusion areas are the urban extensions of Kissimmee and Orlando, each about 2 miles away.

Ecosystems:

Terrestrial Habitats:

Pine Flatwoods:

Pine flatwoods constitute a major terrestrial habitat on the Shingle Creek site. These areas generally extend to the east and west of Shingle Creek which runs north and south through the western portion of the site. Marsh areas, cypress domes, and strands are dispersed throughout the pine flatwoods. Longleaf pines and saw-palmettos are the dominant vegetation. The description of

Item

Description

Cypress Domes
and Strands:

pine flatwoods given for the Econlockhatchee South site is applicable. These areas provide habitat for a variety of wildlife as shown in Table 8.1-7.

Cypress domes and strands are scattered throughout the site. They particularly are apparent in low areas of the pine flatwoods. They provide a quality habitat, both terrestrial and aquatic, which is utilized by a number of species of birds, mammals, reptiles and amphibians. Table 8.1-7 lists vertebrates known to inhabit this type of habitat. The Shingle Creek site is particularly rich in cypress domes and strands that provide quality habitat as characterized by well established cypress trees in the wet centers of the domes and a diversity of dense vegetation extending to the drier portions of the domes. A list of vertebrates associated with this type of habitat is given in Table 8.1-7. A gopher tortoise (Gopherus polyphemus) was observed in the pine flatwoods. This reptile is classified as a threatened species by the Florida Committee on Rare and Endangered Plants and Animals.

Mixed Cypress--
Hardwood Swamps:

There are very dense stands of cypress and hardwood in the swamp area along Shingle Creek. These areas are very high quality habitat and extend north and south across the site. Several drainage canals also have associated cypress--hardwood areas. A significant environmental impact would result if these areas were adversely affected by the construction and operation of a generating station.

Item

Description

Freshwater Marshes: Freshwater marshes are rather abundant on this site. Several are scattered throughout the pine flatwoods, and there are extensive marsh areas west of Shingle Creek. These areas represent valuable habitat as well as a natural water purification system. Several species of wading birds were observed in marshes on the site including the little blue heron. A list of other vertebrates that occur in freshwater marshes is given in Table 8.1-7.

Ruderal: There is a transmission line corridor that extends east and west across the northern portion of the site. Some small areas near the western boundary of the site appear to have been used for crop production. These disturbed areas provide habitat for various species of vertebrates as shown in Table 8.1-7.

Aquatic Habitat: Shingle Creek, drainage ditches, and wetlands provide aquatic habitats on the site. Shingle Creek appears capable of supporting a significant fishery. A small house was observed near Shingle Creek with a boat in the yard suggesting the possibility of fishing activities. All of the aquatic habitats support populations of plankton and other aquatic organisms important to the food chain.

Environmental
Quality:

The Shingle Creek site has rather extensive areas of high quality habitat. The densely vegetated sections of Shingle Creek are particularly valuable habitat for a wide diversity of wildlife. The freshwater marshes are also very productive habitat as well as the cypress domes and strands.

8.1.7.6 Environmental Comparisons of Candidate Sites. The following discussions present the major environmental issues and concerns associated with the five candidate sites.

Endangered and Threatened Species

One threatened vertebrate species, the gopher tortoise (Gopherus polyphemus), was observed at the Shingle Creek site during field visits. In addition, the little blue heron (Florida caerula), was observed during field visits to the sites. The Florida Committee on Rare and Endangered Plants and Animals has listed this bird as "a species of special concern."

Approximately 61 species of plants and animals which could potentially occur in the study area are considered to be endangered, threatened, or rare. These include 32 species of birds, 10 species of mammals, 7 species of reptiles, 2 species of amphibians, and 10 species of plants. These species are listed in Table 8.1-7, Sensitive Animal and Plant Species Potentially Present in the Study Area.

Ambient Air Quality

No major air pollution sources appear to be close enough to any of the candidate sites to significantly influence air quality. The Econlockhatchee North and South sites are near the Orange County landfill, and it is conceivable that during certain earth moving operations at the landfill, particulate concentration at the sites could increase.

Orange County is designated as a nonattainment area for ozone. The operation of a coal-fired generating station will not contribute to the ozone concentration.

Environmental Acceptability of Candidate Sites

One of the five candidate sites appears to be environmentally unacceptable, the Econlockhatchee North site. This site has extensive swamp and

freshwater marsh areas, as well as dense hardwoods associated with the Econlockhatchee River and tributaries on site. The construction and operation of a generating station would have potential adverse impacts on these valuable and sensitive habitats. The amount of quality habitat that would be affected is a major consideration.

The Econlockhatchee South site contains some heavily wooded areas and wetlands. The quantity of habitat that would be impacted by a generating station project is not excessive. The most environmentally sensitive areas in the vicinity of the site, the Wide Cypress Swamp and the Econlockhatchee River, have been avoided.

There are a number of areas of high quality habitat on the Southeast Orange County site. The habitat on this site appears to be more productive than the Econlockhatchee South site. More wildlife, including deer, quail, wading birds, and armadillo, were observed on this site.

The Shingle Creek site contains some very sensitive areas. The swamps associated with Shingle Creek appear to be highly productive habitats. There is a wide diversity of vegetation capable of supporting a variety of wildlife species. Shingle Creek also represents a significant aquatic habitat.

The Lake Harney Southeast site has rather extensive areas of pine flatwoods as well as more productive areas of freshwater marshes and cypress-hardwood swamps. It is likely that more species and numbers of birds are in the vicinity of this site than the others. Birds are attracted to Lake Harney and the St. Johns River.

Finally, the Econlockhatchee South, Southeast Orange County, Shingle Creek, and Lake Harney Southeast sites appear to be the most environmentally acceptable sites for the construction and operation of a generating station.

8.1.8 Proposed Site

The candidate site designated as Econlockhatchee South--Site 20A, was determined to be the most economically feasible and environmentally acceptable site. Figure 8.1-14 illustrates the location of this site in relation

to Orlando and the Iron Bridge Road Regional Water Pollution Control Facility. This site has been designated the Curtis H. Stanton Energy Center.

TABLE 8.1-1. SPACE ALLOCATIONS FOR 1986 COAL-FUELED POWER PROJECT

<u>Site Usage</u>	<u>Acres</u>
Power Block and Substation Facilities	75
Coal Handling and Storage Facilities	150
Coal Delivery and Plant Railroad Trackage	30
Scrubber Additive Handling and Storage Facilities	15
Plant Waste (Ash and Sludge) Handling and Transient Storage Facilities	15
Ash and Sludge Storage Facilities	750
Water Supply Storage Impoundment	60
Drainage and Wastewater Impoundments	50
Cooling Towers and Buffer Zones	40
Roads	15
Construction Area	75
Exclusionary and Buffer Space	<u>1,000</u>
	2,285 (minimum)

TABLE 8.1-2. ECOLOGY

<u>Site</u>	<u>Hydrology</u>	<u>Land Use</u>	<u>Terrestrial Ecosystems</u>	<u>Aquatic Ecosystems</u>	<u>Accessibility</u>
1A	SF/STPE/G	0	M	M	A
1B	SF/G	0	UA	UA	A
1C	SF/STPE/G	0	A	A	A
1D	SF/STPE/G	0	M	M	A
1E	SF/STPE/G	AG/R	M	M	A
2A	SF/STPE/G	0	M	A	A
2B	SF/STPE/G	R	M	A	A
3A	G/STPE	0	M	A	A
3B	G/STPE	R	A	A	A
4A	SF/G	AG	A	M	A
4B	SF/G	0	M	A	UA
5A	G	0	A	M	A
6A	SF/G	0	A	A	A
7A	SF/G	0	A	A	UA
8A	SF/G	AG	A	A	M
8B	G/SF	0	M	A	M
10A	G	R	M	A	A
16A	SF/G	0	A	A	A
17A	SF/STPE/G	R	UA	UA	A
18A	STPE/G	0	M	M	A
19A	STPE/G	0	A	M	A
20A	STPE/G	0	A	A	A

KEY:

A - Acceptable
 AG - Agriculture
 G - Ground Water
 M - Marginal
 O - Open Land

R - Residential Development
 SF - Surface Water
 STPE - Sewage Treatment Plant Effluent
 UA - Unacceptable

TABLE 8.1-3. BASE DATA FOR CANDIDATE SITES

	Site 1C <u>Lake Harney SE</u>	Site 2A <u>Shingle Creek</u>	Site 3A <u>Southeast Orange</u>	Site 19A <u>Econlockhatchee N.</u>	Site 20A <u>Econlockhatchee S.</u>
Technical/Economic (millions)	1,669	1,636	1,676	1,650	1,645
Hydrology-Water Quality	9 per cent	2.8 per cent	0	2.6 per cent	1.1 per cent
Air Quality	2 miles	2 miles	4 miles	8 miles	8 miles
Land Use (Future)	25 per cent	Fully	25 per cent	25 per cent	25 per cent
Ecology					
Terrestrial Ecosystems	Excellent	Fair	Good	Fair	Excellent
Aquatic Ecosystems	Good	Fair	Good	Poor	Good
General Site Acceptability	Excellent	Marginal	Excellent	Fair	Excellent

TABLE 8.1-4. RAW SCORES FOR CANDIDATE SITES

	Site 1C <u>Lake Harney SE</u>	Site 2A <u>Shingle Creek</u>	Site 3A <u>Southeast Orange</u>	Site 19A <u>Econlockhatchee N.</u>	Site 20A <u>Econlockhatchee S.</u>
Technical/Economic	98	100	97.6	99.1	99.4
Hydrology-Water Quality	64	88.8	100	89.6	95.6
Air Quality	40	40	80	100	100
Land Use (Future)	100	25	100	100	100
Ecology					
Terrestrial Ecosystems	100	60	80	60	80
Aquatic Ecosystems	80	60	80	40	80
General Site Acceptability	100	20	100	60	100

TABLE 8.1-5. CANDIDATE SITE EVALUATIONS

	Weight (per cent)	Site 1C Lake Harney SE		Site 2A Shingle Creek		Site 3A Southeast Orange		Site 19A Econlockhatchee North		Site 20A Econlockhatchee South	
		Raw No.	Adj. No.	Raw No.	Adj. No.	Raw No.	Adj. No.	Raw No.	Adj. No.	Raw No.	Adj. No.
Technical/Economic	100	98	98	100	100	97.6	97.6	99.1	99.1	99.4	99.4
Hydrology											
Water Quality	5	64	3.2	88.8	4.4	100	5	89.6	4.5	95.6	4.8
Air Quality	15	40	6	40	6	80	12	100	15	100	15
Land Use (Future)	5	100	5	25	1.2	100	5	100	5	100	5
Ecology											
Terrestrial Ecosystems	25	100	25	60	15	80	20	60	15	80	20
Aquatic Ecosystems	25	80	20	60	15	80	20	40	10	80	20
General Site Acceptability	25	100	25	20	5	100	25	60	15	100	25
Total Environmental	100	--	84.2	--	46.6	--	87.0	--	64.5	--	89.8

TABLE 8.1-6. CANDIDATE SITE EVALUATION SENSITIVITY ANALYSIS

	Lake Harney SE		Shingle Creek		Southeast Orange		Econlockhatchee N.		Econlockhatchee S.	
	Adj. No.	Final No.	Adj. No.	Final No.	Adj. No.	Final No.	Adj. No.	Final No.	Adj. No.	Final No.
50 Per Cent Technical/Economic	98	49	100	50	97.6	48.8	99.1	49.6	99.4	49.7
50 Per Cent Environmental	84.2	42.1	46.6	23.3	87.0	43.5	64.5	32.2	89.8	44.9
50/50 Total	--	91.1	--	73.3	--	92.3	--	81.8	--	94.6
45 Per Cent Technical/Economic	98	44.1	100	45	97.6	43.9	99.1	44.6	99.4	44.7
55 Per Cent Environmental	84.2	46.3	46.6	25.6	87.0	47.8	64.5	35.5	89.8	49.4
45/55 Total	--	90.4	--	70.6	--	91.7	--	80.1	--	94.1
40 Per Cent Technical/Economic	98	39.2	100	40	97.6	39.0	99.1	39.6	99.4	39.8
60 Per Cent Environmental	84.2	50.5	46.6	28.0	87.0	52.2	64.5	38.7	89.8	53.9
40/60 Total	--	89.7	--	68.0	--	91.2	--	78.3	--	93.7
55 Per Cent Technical Economic	98	53.9	100	55	97.6	53.7	99.1	54.5	99.4	54.7
45 Per Cent Environmental	84.2	37.9	46.6	21.0	87.0	39.2	64.5	29.0	89.8	40.4
55/45 Total	--	91.8	--	76.0	--	92.9	--	83.5	--	95.1
60 Per Cent Technical/Economic	98	58.8	100	60	97.6	58.6	99.1	59.5	99.4	59.6
40 Per Cent Environmental	84.2	33.7	46.6	18.6	87.0	34.8	64.5	25.8	89.8	35.9
60/40 Total	--	92.5	--	78.6	--	93.4	--	85.3	--	95.5

TABLE 8.1-7. SENSITIVE ANIMAL AND PLANT SPECIES POTENTIALLY PRESENT IN THE STUDY AREA

Common Name	Scientific Name	FCREPA Status*	Comment
<u>BIRDS</u>			
Wood Stork	<u>Mycteria americana</u>	E**	Breeding colony in southwest Orange County (72-73).
Florida Everglade Kite	<u>Rostrhamus sociabilis plumbeus</u>	E	May no longer be present.
Peregrine Falcon	<u>Falco peregrinus</u>	E	May not be present.
Ivory-billed Woodpecker	<u>Campephilus principalis</u>	E	Possible 1975 sighting; not likely to occur.
Red-cockaded Woodpecker	<u>Picoides borealis</u>	E	Flatwoods; cypress areas.
Louisiana Waterthrush	<u>Seiurus mutacilla</u>	R	
American Redstart	<u>Steophaga rutucilla</u>	R	
Bachman's Warbler	<u>Vermivora bachmanii</u>	E	Very rare migrant? Hardwood swamp.
Kirtland's Warbler	<u>Dendroica kirtlandii</u>	E	Very rare migrant? Flatwoods.
Florida Grasshopper Sparrow	<u>Ammodramus savannarum floridanus</u>	E	Southern portion of counties; flatwoods.
Southern Bald Eagle	<u>Haliaeetus l. leucocephalus</u>	T	
Osprey	<u>Pandion haliaetus</u>	T	
Southeastern American Kestrel	<u>Falco sparverius paulus</u>	T	Study area in breeding range.
Audubon's Caracara	<u>Caracara cheriway auduboni</u>	T	Variety of habitats; may not be present.
Florida Sandhill Crane	<u>Grus canadensis pratensis</u>	T	Variety of habitats.
Least Tern	<u>Sterna albifrons antillarum</u>	T	
Florida Scrub Jay	<u>Aphelocoma c. coerulescens</u>	T	Scrubby flatwoods.
White-tailed Kite	<u>Elanus caeruleus majusculus</u>	R	Pasture; crop lands.
Short-tailed Hawk	<u>Buteo brachyurus fuliginosus</u>	R	Study area in summary range; flatwoods and cypress.
White Ibis	<u>Eudocimus albus</u>	S	Cypress and hardwood swamp.
Little Blue Heron	<u>Florida caerulea</u>	S	Cypress and hardwood swamp.

(1 of 4)

TABLE 8.1-7 (Continued). SENSITIVE ANIMAL AND PLANT SPECIES POTENTIALLY PRESENT IN THE STUDY AREA

Common Name	Scientific Name	FCREPA Status*	Comment
Great Egret	<u>Casmerodius albus</u>	S	Cypress and hardwood swamp.
Snowy Egret	<u>Egretta thula</u>	S	Cypress and hardwood swamp.
Louisiana Heron	<u>Hydranassa tricolor</u>	S	Cypress and hardwood swamp.
Black-crowned Night Heron	<u>Nycticorax nycticorax</u>	S	Cypress and hardwood swamp.
Yellow-crowned Night Heron	<u>Nyctanassa violacea</u>	S	Cypress and hardwood swamp.
Least Bittern	<u>Ixobrychus exilis</u>	S	Fresh marsh.
Coopers Hawk	<u>Accipiter cooperii</u>	S	Study area within range.
Florida Burrowing Owl	<u>Athene cunicularia floridana</u>	S	Study area within range; pasture; cropland.
Southern Hairy Woodpecker	<u>Picoides villosus audubonii</u>	S	Study area within range; variety of forest areas.
Merlin	<u>Falco columbarius</u>	U	Study area within winter range; pine; oak; pasture, cropland.
White Breasted Nuthatch	<u>Sitta carolinensis carolinensis</u>	S	Very old records; variety of habitats.
<u>PLANTS</u>			
Pygmy Fringe-tree	<u>Chionanthus pygmaeus</u>	E	Restricted to Florida scrub habitats; apparently well south of study area.
Highlands Scrub Hypericum	<u>Hypericum cumulicola</u>	E	Restricted to Florida.
Lewton's Polygala	<u>Polygala lewtonii</u>	E	An endemic of Florida scrub.
Scrub Plum	<u>Prunus geniculata</u>	E	An endemic of Florida scrub.
Curtis Milkweed	<u>Asclepias curtissii</u>	T	An endemic of Florida scrub.
Buckthorn	<u>Bumelia lycioides</u>	R	
Scrub Buckwheat	<u>Eriogonum floridanum</u>	R	

TABLE 8.1-7 (Continued). SENSITIVE ANIMAL AND PLANT SPECIES POTENTIALLY PRESENT IN THE STUDY AREA

Common Name	Scientific Name	FCREPA Status*	Comment
Hartwrightia	<u>Hartwrightia floridana</u>	R	
Fall-flowering Ixia	<u>Nemastylis floridana</u>	R	
Spoon-flower	<u>Peltandra sagittifolia</u>	R	
<u>FISH</u>			
None			
<u>AMPHIBIANS</u>			
Florida Gopher Frog	<u>Rana aerolata aesopus</u>	T	Possibly in marshy areas.
Striped Newt	<u>Notophthalmus perstriatus</u>	R	Possible in marshy areas.
<u>REPTILES</u>			
Short-tailed Snake	<u>Stilosoma extenuatum</u>	E	Possibly in pine-oak habitat.
Gopher Tortoise	<u>Gopherus polyphemus</u>	T	Possibly in pine-oak or scrubby flatwood habitats.
Sand Skink	<u>Neoseps reynoldsi</u>	T	Possibly in pine-oak habitat.
Florida Scrub Lizard	<u>Sceloporus woodi</u>	R	Possibly in pine-oak habitat.
American Alligator	<u>Alligator mississippiensis</u>	S	Possible in wetlands.
Eastern Indigo Snake	<u>Drymurchon corais couperi</u>	S	Variety of habitats.
Spotted Turtle	<u>Clemmys guttata</u>	R	May no longer be present; marshes.

TABLE 8.1-7 (Continued). SENSITIVE ANIMAL AND PLANT SPECIES POTENTIALLY PRESENT IN THE STUDY AREA

Common Name	Scientific Name	FCREPA Status*	Comment
<u>MAMMALS</u>			
Florida Panther	<u>Felis concolor coryi</u>	E	
Shermans Fox Squirrel	<u>Sciurus niger shermani</u>	T	Study area within range; variety of wooded habitats.
Florida Mouse	<u>Peromyscus floridanus</u>	T	Scrubby flatwoods; cypress.
Florida Black Bear	<u>Ursus americanus floridanus</u>	T	Variety of habitats.
Big Brown Bat	<u>Eptesicus fuscus</u>	R	Study area within range; unlikely.
Florida Longtailed Weasel	<u>Mustela frenata peninsulae</u>	R	Variety of habitats.
Southeastern Shrew	<u>Sorex longirostris longirostris</u>	R	Study area within range; hardwood swamps.
Hoary Bat	<u>Lasiurus cinereus</u>	R	
Southeastern Big-eared Bat	<u>Plecotus rafinesquii</u>	R	Study area within range.
Round-tailed Muskrat	<u>Neofiber alleni</u>	U	Study area within range; fresh marsh.

*FCREPA--Florida Committee on Rare and Endangered Plants and Animals.

**E--Endangered, R--Rare, T--Threatened, S--Species of special concern, U--Undetermined status.

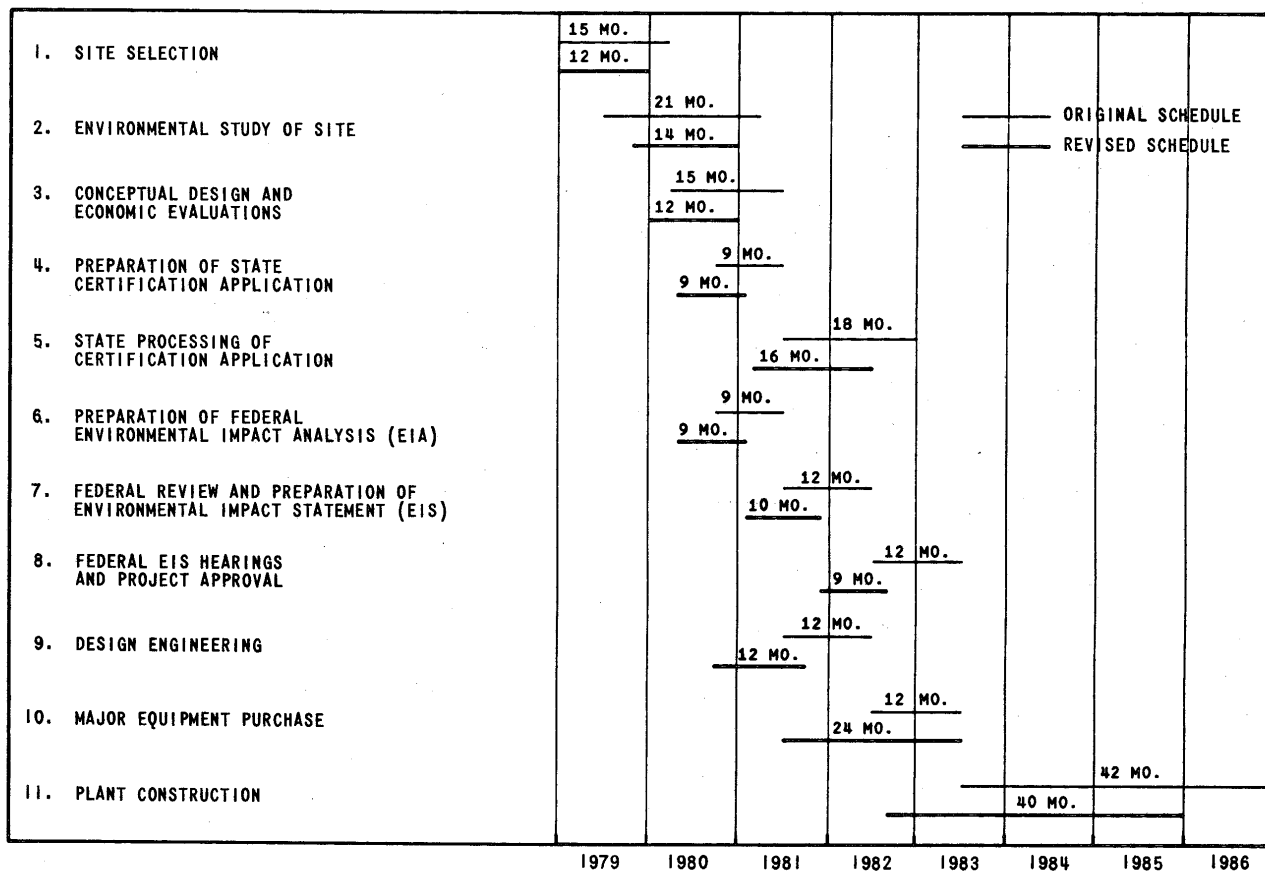


FIGURE 8.1-1. POWER PLANT SCHEDULE
USED FOR SITING ANALYSIS

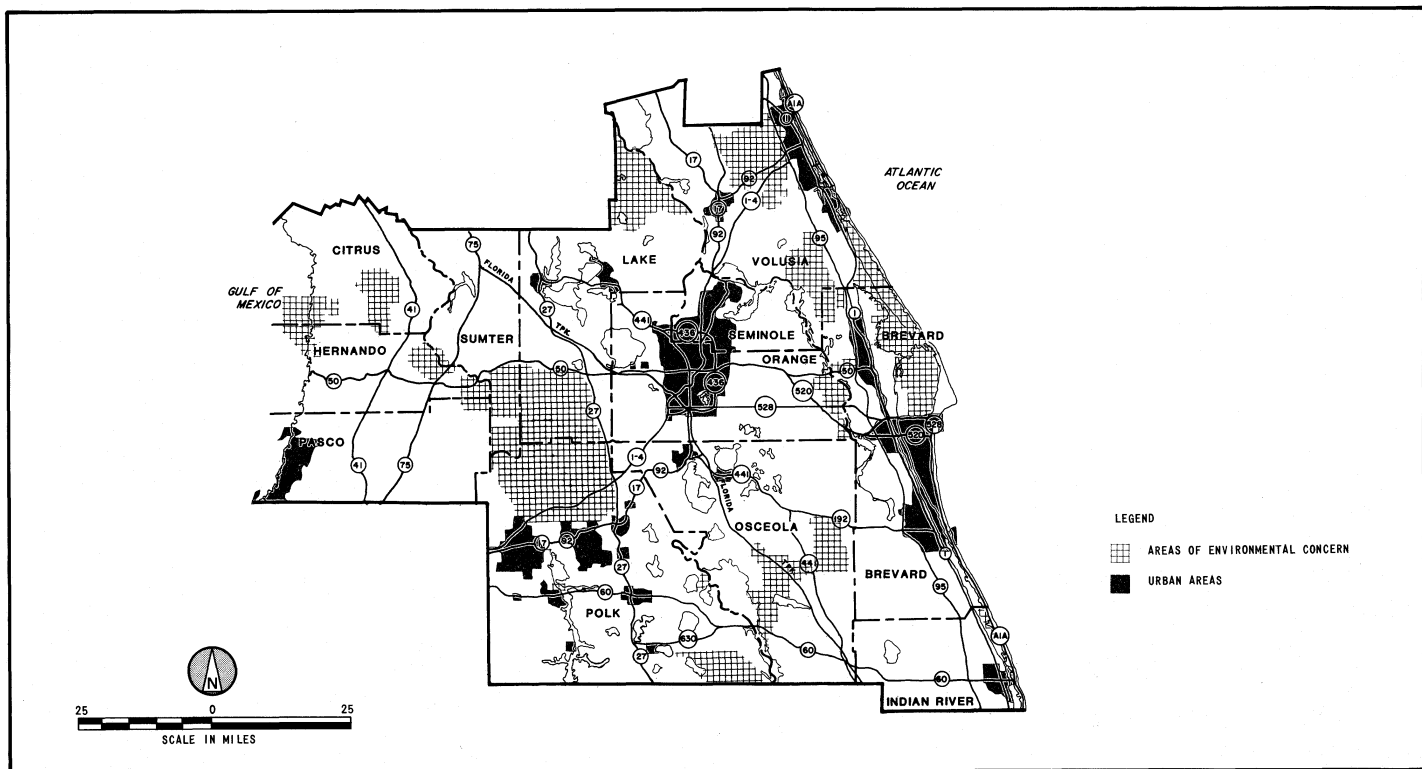


FIGURE 8.1-3. INITIAL EXCLUSION AREAS FOR POWER PLANT SITING

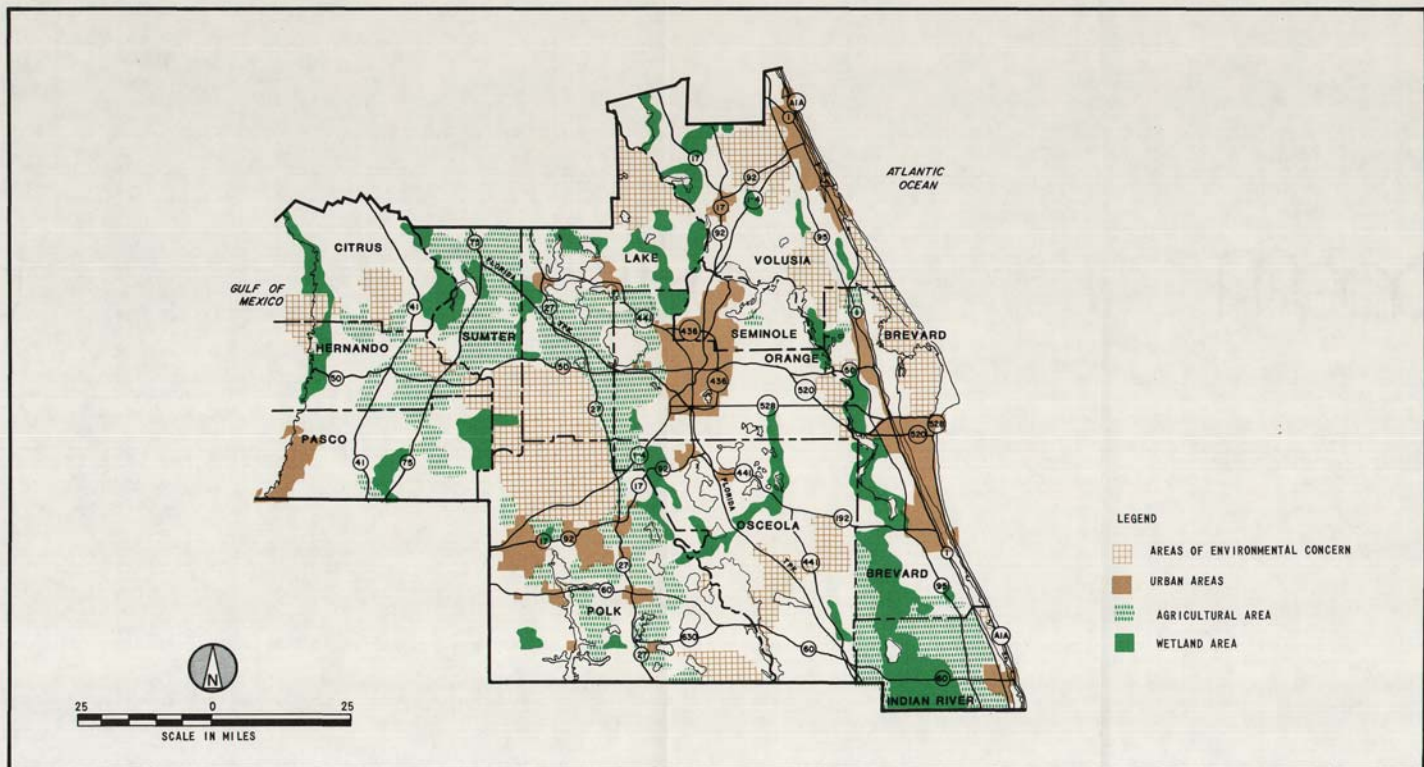


FIGURE 8.1-4. AREAS EXCLUDED FROM POWER PLANT SITING CONSIDERATION