FINAL

2000 AIR EMISSIONS INVENTORY

BIG CYPRESS NATIONAL PRESERVE
FLORIDA

U.S. NATIONAL PARK SERVICE

FEBRUARY 2003

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Cover Photo: Big Cypress National Preserve Near Raccoon Point with Off-Road Vehicle (OR V) Trail in Foreground (Photo: Thomas Lodge, EA Engineering, Science, and Technology)

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1. INTRODUCTION

1.1 BACKGROUND

In August of 1999, the National Park Service (NPS) embarked on the Natural Resource Challenge, a major effort to substantially improve how the NPS manages the natural resources under its care. As part of Natural Resource Challenge, the NPS Air Resources Division (ARD) was tasked with the responsibility of expanding efforts to monitor and understand air quality and related values in the parks. In addition, the NPS Environmental Leadership policy directs the NPS to manage the parks in a manner "that demonstrates sound environmental stewardship by ¡mplementing sustainable practices in all aspects of NPS management...." In order to achieve both of these objectives, it is necessary to gain an understanding of air pollution emissions that result from activities within the park. Development of an in-park air emissions inventory for Big Cypress National Preserve (N Pres) serves three functions in this regard. First, it provides an understanding of the sources and magnitude of in-park emissions and a basis for contrasting them with emissions from the surrounding area. Second, it identifies existing and potential strategies to mitigate in-park air emissions. Finally, it evaluates and ensures the compliance status of the park relative to state and federal air pollution regulations.

1.2 TYPICAL AIR EMISSION SOURCES

Typical air emission sources within NPS units include stationary, area, and mobile sources. Stationary sources can include fossil fuel-fired space and water heating equipment, generators, fuel storage tanks, and wastewater treatment plants. Area sources may include woodstoves and fireplaces, campfires, and prescribed burning and wild fires. Mobile sources may include vehicles operated by visitors and NPS employees and nonroard vehicles and equipment.

1.3 INVENTORY METHODOLOGY

The methodology to accomplish the air emissions inventory was outlined in a protocol that was prepared at the initiation of the project (EA Engineering 2001). Tasks consisted of a site survey in January 2002, interviews with Big Cypress N Pres[1] personnel, review of applicable preserve records, emission calculations, review of applicable state air quality regulations, an assessment of mitigation measures and potential emission reduction initiatives, and report preparation. The data were used in conjunction with a number of manual and computer software computational tools to calculate emissions. Computational tools included U.S. Environmental Protection

1 Ron Clark, Big Cypress National Preserve, Chief, Resource Management (941) 695-1106

Agency (USEPA) emission factors such as the Factor Information Retrieval System (FIRE) database, USEPA *TANKS 4.0* model, U.S. Forest Service *First Order Fire Effects Model (FOFEM) 4.0* model, and USEPA *MOBILE6.2* and *PART5* mobile source emissions model. The year 2000 was selected as the basis for the air emission inventory since data for that year were the most recent available at the preserve. It should be noted that emissions are expected to vary from year to year due to fluctuations in visitation, prescribed and wildland fires, and other activities. Additional information on emission estimation methodology, including emission factors, are provided in Appendices A and B.

1.4 PRESERVE DESCRIPTION

Big Cypress N Pres is located in southern Florida and shares a boundary with Everglades National Park, which is located south of the Preserve. In 1974, 45 percent of the Big Cypress Watershed in southern Florida was set aside as a National Preserve. The Preserve was further expanded in 1988 and now encompasses 729,000 acres. The name Big Cypress refers to the large size of this area where vast expanses of cypress strands span the landscape.
Although the wild country is protected, certain preexisting human uses that are not allowed in most national park areas are permitted to continue. These include hunting, oil and gas exploration, cattle grazing, and off-road vehicle (ORV) use, such as swamp buggies, airboats and all-terrain vehicles. The majority of the Preserve is located in Collier County, and small southeastern and southern sections are located in Miami-Dade County and Monroe County, respectively. Figure 1 is a map of the southern Florida area illustrating the location of the preserve relative to Everglades National Park (NP) and Biscayne NP.

Developed areas in the preserve include NPS facilities, privately-owned oil and gas production sites at Bear Island and Raccoon Point, the 26,000 acre Dade-Collier Jetport, and approximately 220 in-holdings that include private homes and several commercial facilities (Figure 2). The two developed NPS areas in the Preserve are the Ochopee Headquarters and Oasis Visitor Center and Maintenance areas. Both locations are located adjacent to the Tamiami Trail or US Highway 41, which transects the center of the preserve from east to west. Information on these NPS developed areas is summarized in Table 1, and site maps are provided in Figures 3 and 4. The Ochopee Headquarters facility was formerly the privately-owned Big Cypress Lodge, and the single-family NPS employee housing units were private homes that were acquired after the Preserve was established. In early 2002, the fire operations facilities were relocated to Copeland, an area on the west central preserve boundary on Route 29.

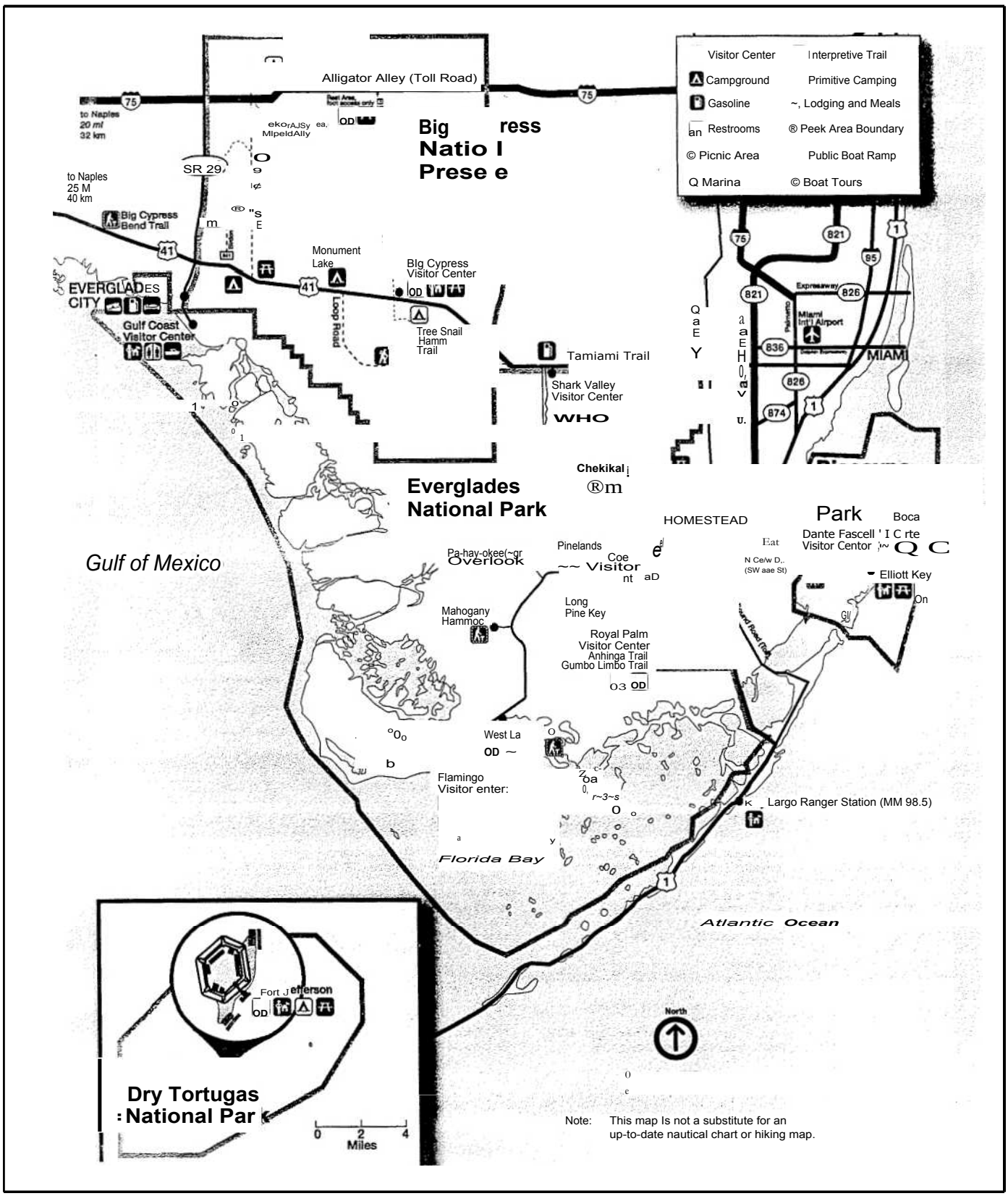

FIGURE 1. BIG CYPRESS NATIONAL PRESERVE LOCATION

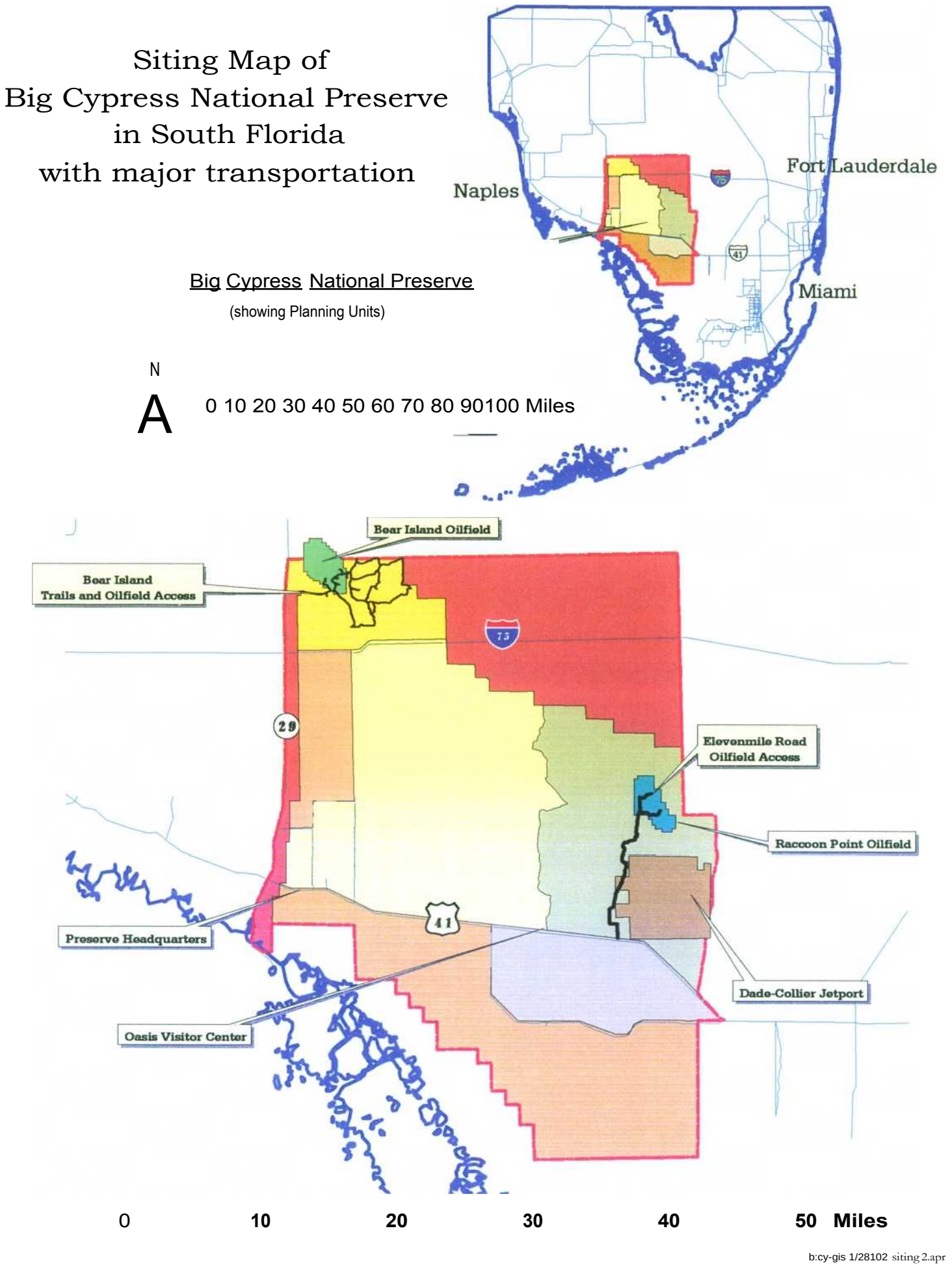

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FIGURE 2. LOCATION OF BIG CYPRESS NATIONAL PRESERVE DEVELOPED AREAS

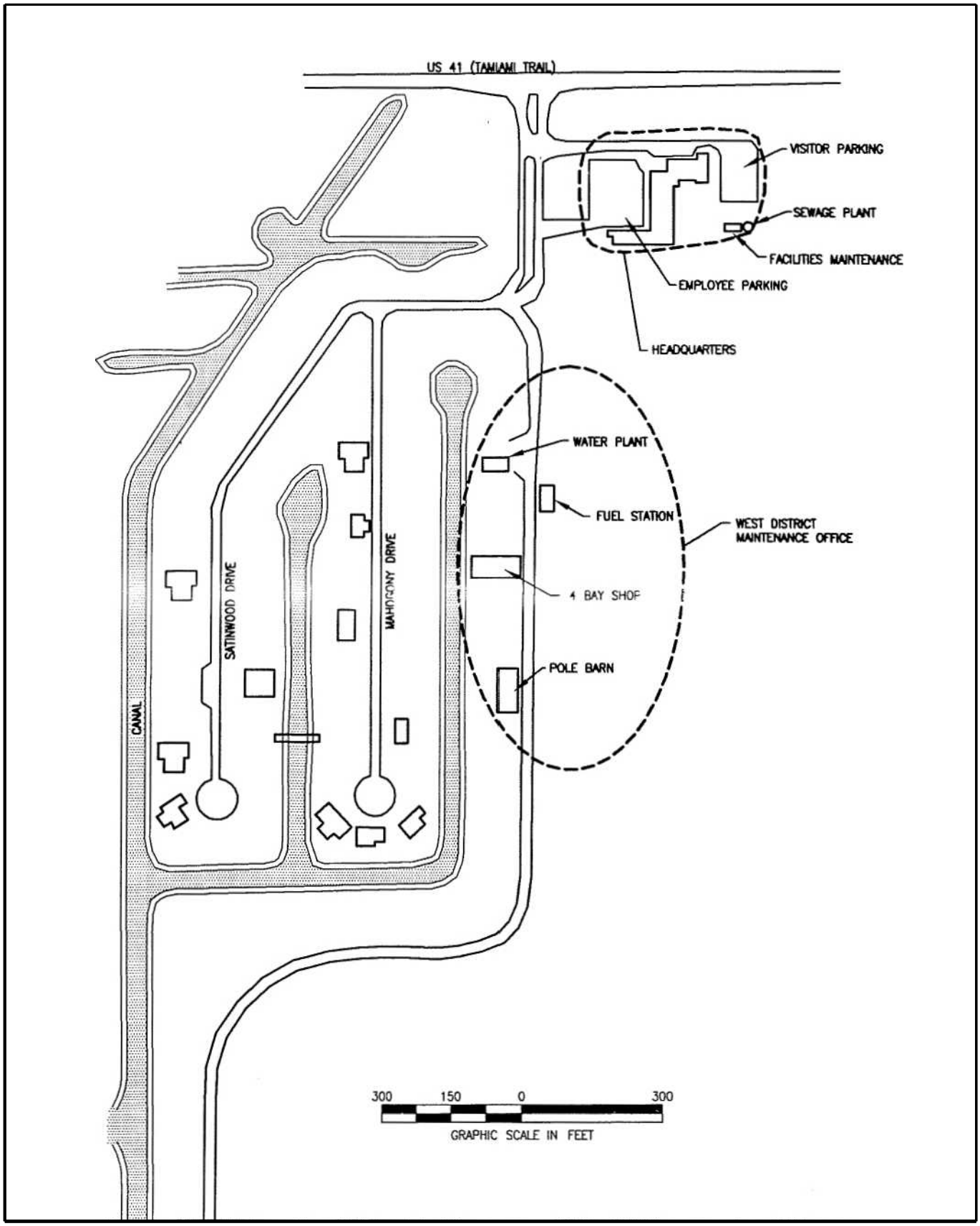

Figure 3. BIG CYPRESS NATIONAL PRESERVE OCHOPEE HEADQUARTERS

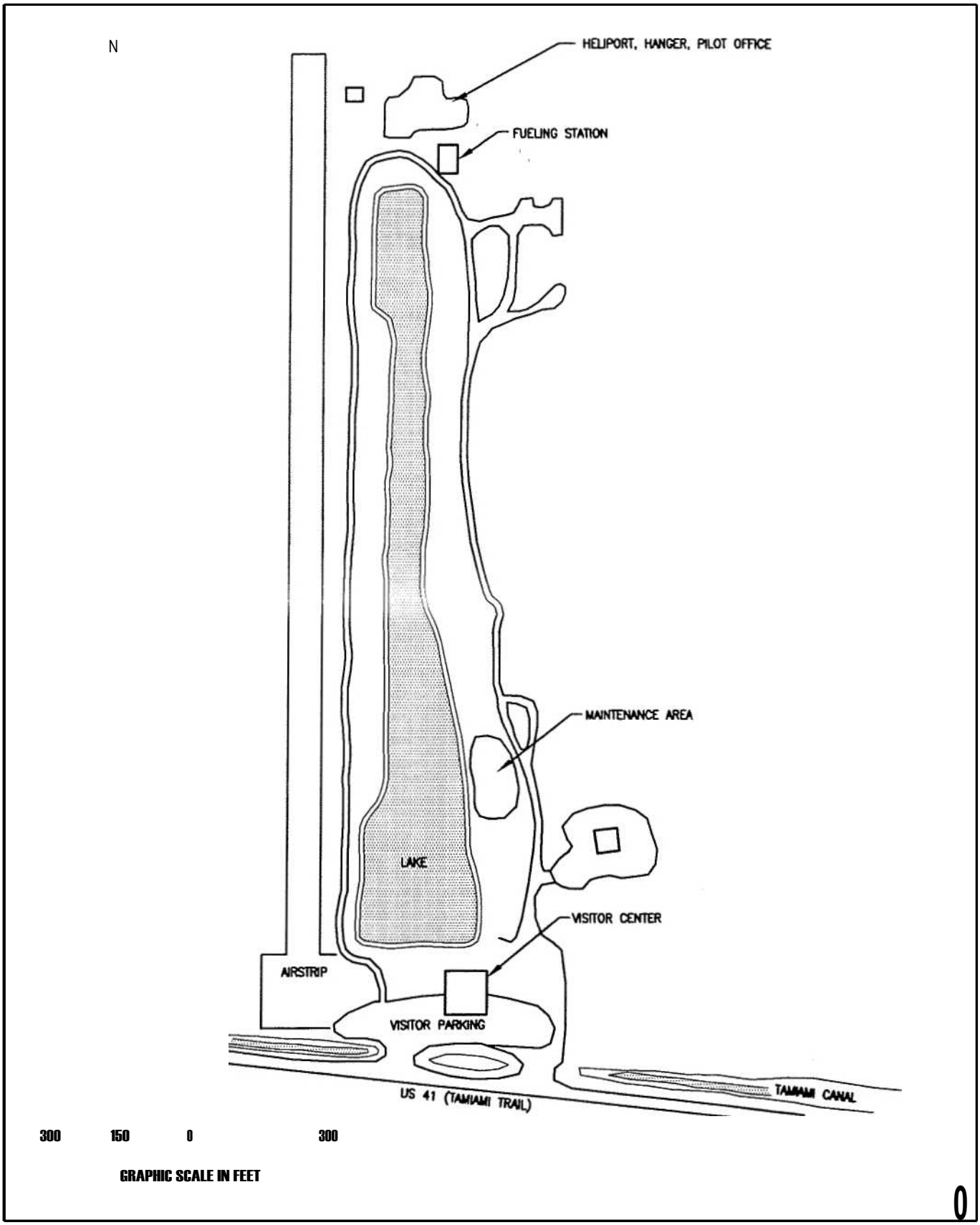

Figure 4. BIG CYPRESS NATIONAL PRESERVE OASIS VISITOR CENTER/ MAINTENANCE AREA

TABLE 1: BIG CYPRESS NATIONAL PRESERVE DEVELOPED AREAS

Name/Location	**Function/Facilities**
Ochopee Headquarters	Preserve Headquarters, Visitor Contact Station, Employee Apartments, Employee Houses, Employee Recreational Facilities, Fueling Station, 4-Bay Maintenance Shop, Water Treatment Plant, and Wastewater Treatment Plant,
Oasis Visitor Center and Maintenance Area	Visitor Center, Maintenance Shops, Fire Cache, Fueling Station, Aircraft Hangar, Aircraft Fueling Station, Heliport, Paved Airstrip, Radio and Relay Tower
Raccoon Point Oilfield	Field Operations Office, six producing oil and gas wells, heated product separation columns, water storage tanks, natural gas flare
Bear Island Oilfield	Three producing oil and gas wells, heated product separation columns, water storage tanks, natural gas flare

1.5 AIR QUALITY STATUS

The Florida Department of Environmental Protection (DEP) Division of Air Resource Management administers the state's air pollution program, and the South District office in Fort Myers is the local contact for Collier County. The Preserve is located in Collier, Dade, and Monroe Counties, which are classified as attainment for all the National Ambient Air Quality Standards (NAAQS). An ozone monitor once was located in the Preserve in the Pinecrest area in the southeastern portion of the Preserve. The monitor was established and operated by a major oil company when the company owned and operated oil and gas wells on the preserve. However, the monitor was discontinued and removed when its holdings were sold.

2. STATIONARY AND AREA SOURCE EMISSIONS

This section summarizes emissions from stationary sources at the Preserve for the year 2000. The discussion is divided into sections covering emissions from combustion sources, fuel storage sources, and area sources. The following emissions were calculated for each source: particulate matter (PMIO), sulfur dioxide (SO2), nitrogen oxides (NO_X), carbon monoxide (CO), carbon dioxide (C02), and volatile organic compounds (VOCs). Emission factors used in the calculations are provided in Appendix A.

2.1 STATIONARY SOURCES

2.1.1 Space And Water Heating Equipment

The only fossil fuel heating source at the Preserve is a propane water-heating unit at the park's headquarters in Ochopee. All other NPS space and heating units are electric. Criteria emissions were calculated using the appropriate residential emission factors for propane. For example, PM emissions are calculated as follows:

$$4{,}380 \text{ gallons/yr} \times \frac{0.4 \text{ lb PM}}{1{,}000 \text{ gallons}} = 2 \text{ lb PM/yr}$$

Actual criteria pollutant emissions from water heating equipment are summarized in Table 2. Potential emissions also were calculated by assuming that the heating unit was operated continuously during the year, and these emissions also are noted in Table 2.

TABLE 2. 2000 ACTUAL AND POTENTIAL AIR EMISSIONS FROM BIG CYPRESS NATIONAL PRESERVE HEATING EQUIPMENT

Location	N	Fuel	Fuel Consumption	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO_X (Ibs/yr)	CO (lbs/vr)	CO2 (Ibs/yr)	VOC (lbs/yr)
Actual Emissions									
Headquarters		Propane	4,380	2		61		54,750	
Potential' Emissions									
Headquarters		**Propane**	9,574	4	0	134	**18**	19,672	

2.1.2 Generators

There are four NPS-owned generators in the Preserve. Emissions were calculated by multiplying the unit rating (kW) of the generators by an estimated annual run time (hr/yr) to get the kW-hr/yr,

and the appropriate emission factors were then applied. For example, PM emissions from the 100 kW diesel generator at Oasis Fuel Island were calculated as:

$$100\ kW\ x\ \frac{24\ hours}{year}\ x\ \frac{1.34\ hp}{kW}\ x\ \frac{0.00220\ lb\ PM}{hp\text{-}hr} = 7\ lb\ PM/yr$$

Potential emissions also were calculated for the generators. According to EPA guidance on calculating potential emissions from generators, 500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate. Actual and potential generator emissions are summarized in Table 3.

TABLE **3. 2000** ACTUAL AND POTENTIAL AIR EMISSIONS FROM BIG CYPRESS N PREs GENERATORS

Location	Rating (kW)	Run Time	PM10 (lbs/yr)	SO_2 (lbs/yr)	NO_X (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	VOC (lbs/yr)
Actual Emissions								
Oasis Fuel Island	100	24	7	7	100	21	3,698	
Oasis Radio Repeate	15	24	1		15	3	555	1
Ochopee Headquarters	20	24	1	1	20	4	740	2
Birdon Road	5	24	0	0	5	1	185	0
		Total	10	9	140	30	5,178	11
Potential Emissions								
Oasis Fuel Island	100	500	147	137	2,077	448	77,050	168
Oasis Radio Repeater	15	500	22	21	312	67	11,558	25
Ochopee Headquarters	20	500	29	21	415	90	15,410	34
Birdon Road	5	500	7	7	104	22	3,853	8
		Total	206	192	2,908	627	107,870	235

2.1.3 Fuel Storage Tanks

Big Cypress N Pres has five gasoline, two diesel fuel, two AVGAS, and 2 JP-8 aboveground storage tanks that service NPS vehicles and other motorized equipment. There are no public automotive service stations in the park.

There are two basic types of VOC emissions from storage tanks: working losses and standing losses. Working losses are composed of both withdrawal and refilling loss emissions. Withdrawal loss emissions result from the vaporization of liquid fuel residue on the inner surface of tank walls as the liquid levels in the tank are decreased and air is drawn into the tank.

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1 *Calculating Potential to Emit (PTE) for Emergency Generators,* Office of Air Quality Planning and Standards (MD-10) U.S. Environmental Protection Agency, September 6, 1995.

Refilling losses refer to fuel vapor releases to the air during the process of refilling the tank as the liquid level in the tank increases and pressurizes the vapor space. Standing losses describe those tank emissions from the vaporization of the liquid fuel in storage due to changes in ambient temperatures. VOC losses are also a direct function of the annual product throughput or turnovers. Emissions from diesel tanks are extremely small since the volatility of diesel fuel is extremely low compared to gasoline. VOC emissions from the NPS fuel storage tanks were calculated using the USEPA *TANKS* software program. *TANKS* is based on the emission estimation procedures from Chapter 7 of EPA's Compilation of Air Pollutant Emission Factors (AP-42) and uses chemical, meteorological, and other data to generate emission estimates for different types of storage tanks. Table 4 summarizes the calculated emissions from the gasoline and AVGAS fuel tanks.

TABLE 4: 2000 BIG CYPRESS N PRES FUEL TANK EMISSIONS

Location	Product	Tank Type	Volume (gal)	Throughput (gal/yr)	VOC (lbs/yr)
Ochopee Headquarters	Gasoline	AST	500	950	117
	Gasoline	AST	500	950	117
Oasis Maintenance	Gasoline	AST	2,000	3,800	402
	Gasoline	AST	2,000	3,800	402
	Gasoline	AST	2,000	3,800	402
	AVGAS	AST	2,000	8,576	1
				Total	1,441

2.1.4 Wastewater Treatment Plants

The Preserve has one relatively small wastewater treatment plant (WWTP) at Ochopee Headquarters. Annual throughput for the plant was not available, and VOC emissions would be minor based on the plants capacity of 15,000 gallon per day.

2.2 AREA SOURCES

2.2.1 Woodstoves

There are no documented woodstores or fireplaces in the Preserve.

2.2.2 Campfires

There are seven campgrounds in the Preserve. Most are primitive, and the three locations off U.S. Highway 41 are used predominantly by recreational vehicle users. Park officials estimate that very few campfires are observed at these locations.

2.2.3 Wildland Fires and Prescribed Burning

Wildland fires are ignited naturally, usually by lightening and are typically suppressed, while prescribed fires are ignited intentionally in order to achieve fire management objectives. Prescribed burning is a land treatment process to accomplish natural resource management objectives, including reducing the potential for destructive wildfires, eliminating excessive fuel buildup, controlling insects and disease, improving wildlife habitat and forage production, maintaining natural succession of plant communities, and restoring natural processes. Only prescribed burning emissions are considered as anthropogenic emissions; however, to the extent that prescribed burning is conducted to achieve ecological benefit, the emissions could be considered natural.

The First Order Fire Effects Model (FOFEM) was used to estimate emissions. FOFEM is a computer program developed by the Intermountain Fire Sciences Lab, U.S. Forest Service to predict the effects of prescribed fire and wildfire in forests and rangelands throughout the U.S. In particular, it quantifies emissions of PM10, PM2 ,5, CO, C02, and CH4, which are summarized in Table 5.

TABLE 5: PRESCRIBED AND WILDFIRE AIR EMISSIONS FROM BIG CYPRESS N PRES

Fire Type	Fuel Type	Acres	PM10 (tons/yr)	$PM_{2.5}$ (tons/yr)	Co (tons/yr)	CO_2 (tons/yr)	VOC' (tons/yr)
Wildland	Pine	15,400	1,517	1,286	16,270	118,395	755
Prescribed	Pine	17,500	1,724	1,461	18,489	134,540	858
	Grass	12,444	56	44	112	31,073	12
	Total	29,944	1,780	1,505	18,601	165,613	870
	Park Totals	45,344	3,297	2,791	34,871	284,008	1,625

[1] As methane

2.2.4 Miscellaneous Area Sources

Miscellaneous area sources include food preparation, degreasers, paints and other surface coatings, lighter fluid consumption, consumer solvents, and propane use by visitors in recreational vehicles. However, there are no data on the consumption of these materials.

2.3 Oil and Gas Operations

The 1974 legislation for the Preserve provided for numerous uses, including the extraction of oil and gas as long as this development is not detrimental to the purposes of the Preserve. The Bear Island field, discovered in 1972 and located in the northwest corner of the Preserve, includes 11 wells on four pads, which are operated by Calumet Florida, Inc. Of these wells, three are producing wells and eight are shut-in, including one saltwater disposal well. The Raccoon Point field, discovered in 1978 and located in the east central area of the Preserve, includes 13 wells on five pads and also is operated by Calumet Florida, Inc. Of the 13 wells, six are in production, one is a saltwater disposal well, and six wells are shut-in. Table 6 summarizes the oil and gas production from these wells in calendar year 2000. The extracted oil is not stored on site, but is immediately transported off the Preserve by pipelines.

TABLE 6: 2000 OIL AND GAS PRODUCTION AT BIG CYPRESS NATIONAL PRESERVE

Field Location	Oil Production (bbls)	Gas Production (1,000 ft³)
Bear Island	85,180	8,290
Raccoon Point	597,853	75,610
Total	683,033	84,900

Source: *Florida Oil and Gas Monthly Production Report,* Florida Geological Survey

Air emission sources from these oil and gas operations include combustion of the natural gas in on-site operations and off-site flares. The heat content of the natural gas that is extracted from the wells is less than that of commercial value, but it is sufficient to allow the gas to be used for several on-site purposes. These include natural gas-fired heater treatment columns that separate the extracted oil/gas/water emulsion into its respective components and natural gas-fired electricity generators. The generators provide electricity for electric submersible well pumps, office trailers, and other field operations. Natural gas also powers one internal combustion engine (ICE) oil pump at Raccoon Point. Excess natural gas is flared at Raccoon Point, but at Bear Island, it is flared just outside the Preserve's northern boundary. The wells also vent some

hydrogen sulfide, which is monitored to ascertain worker exposure to levels above OSHA standards.

Data were not available on the number or sizes of the generators and separator treatment columns or the fuel consumed by these units. Therefore, it was assumed that the natural gas production noted in Table 6 was consumed equally between mid-size electricity generators/ICE pump engine and external combustion sources, such as the separator treatment heater columns. Calculated emissions are provided in Table 7.

TABLE 7: EMISSIONS FROM OIL AND GAS PRODUCTION AT BIG CYPRESS N PRES

Combustion Unit		PM_{10} **(lbs/yr)**	SO_2 **(lbs/yr)**	NO_x **(lbs/yr)**	**CO (lbs/yr)**	**VOC (lbs/yr)**
Separator Column Heaters		319	25	4,195	3,524	231
Generators		--	26	113,265	48,662	8,390
Total	**lbs/yr**	319	51	117,460	52,186	8,621
	tons/yr	0.16	0.03	58.73	26.09	4.31

2.4 SUMMARY OF STATIONARY AND AREA SOURCE EMISSIONS

Table 8 summarizes the stationary and area source emissions calculated above in a format that allows comparison between the various sources as well as providing totals for each pollutant or pollutant category under consideration.

TABLE 8: SUMMARY OF 2000 STATIONARY AND AREA SOURCE EMISSIONS AT BIG CYPRESS N PRES

Activity	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		Carbon Dioxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Stationar Sources												
Water Heating Unit	2	<0.01	0	0	61	0.03		<0.01	54,750	27.38		<0.01
Generators	10	<0.01	9	<0.01	140	0.07	30	0.01	5,178	2.59	11	<0.01
Gasoline Storage Tanks	--	--	--	--	--	--	--	--	--	--	1,441	0.72
Stationary Sources Subtotal	11	<0.01			201	0.10	37	0.02	59,928	29.96	1,452	0.73
Area Sources												
Prescribed Fires	3,560,000	1,780	--	--	--	--	37,202,000	18,601	331,225,336	165,612	1,740,000'	870
Oil and Gas Production												
See arator Column Heaters	319	0.16	25	0.01	4,195	2.10	3,524	1.76	--		231	0.12
Generators	--	--	26	0.01	113,265	56.63	48,662	24.33	--	--	8,390	4.20
Oil and Gas Production Subtotal	319	0.16	51	0.03	117,460	58.73	52,186	*26.09*	--	--	8,621	4.31
Totals												
	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		Carbon Dioxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Totals without Prescribed Fires	330	0.17	51	0.03	117,661	58.83	52,223	26.11	59,928	29.96	10,073	5.04
Totals with Prescribed Fires	3,560,330	1,780	51	0.03	117,661	58.83	37,254,223	I 8,627	331,285,000	165,643	1,750,073	875

I As methane

3. MOBILE SOURCE EMISSIONS

This section summarizes emissions from mobile sources at the Preserve for 2000. Mobile emission sources include highway and nonroad vehicles. The following emissions were calculated for each source: particulate matter (PM10), nitrogen oxides (NO,,), carbon monoxide (CO), and volatile organic compounds (VOCs).

3.1 VISITOR HIGHWAY AND NONROAD VEHICLES

3.1.1 Visitor Highway Vehicles

The only paved roads in the Preserve are east-west Interstate 75, also known as Alligator Alley, through the northern portion of the Preserve, east-west U.S. Highway 41, also known as the Tamiami Trail, through the southern area, and partially paved state route 94 in the southeast. Interstate 75 provides no vehicle access into the Preserve. Visitors can stop along U.S. Highway 41 at the Visitor Center, Park Headquarters, three campgrounds, and two picnic areas. Two scenic drives through the Preserve provide for wildlife viewing. The Loop Road is a 26-mile, single-lane, unimproved road beginning and ending on State Highway 41 in the southeastern area of the Preserve. Turner River Road and Birdon Road form a u-shaped, 17-mile graded-dirt drive north of the Preserve's headquarters. However, there are no data on the number of vehicles or visitors utilizing these roads and park officials noted that they are not used heavily due to their rough condition.

The number of visitor vehicles operating in NPS units is often correlated to the number of annual visitors to the park unit. Estimated visitors to the Preserve in 2000 were approximately 464,380, and approximately 128,000 visited the Visitor Center. In order to provide some estimate of visitor highway vehicle emissions, it was assumed that the average visitor per vehicle ratio was 2.8 and that the average vehicle traveled the approximate 40 mile distance across U.S. Highway 41, for a total estimated visitor vehicle-miles-traveled (VMT) of 6,634,000 miles per year.

The majority of mobile source emissions can be categorized as either exhaust or evaporative emissions. Exhaust emissions are related to the combustion of fuel in the engine and include YOC, NOx, CO, and PM10. Exhaust emissions are dependent on a number of factors, including engine load, engine design and age, combustion efficiency, emissions equipment such as catalytic converters, and other factors. Evaporative emissions, which can occur while the vehicle is running or at rest, are related to the volatilization of fuel from vapor expansion, leaks and

seepage, and fuel tank vapor displacement. Evaporative emissions are primarily dependent on daily temperature cycles and fuel volatility. In addition to vehicle exhaust, $_{PM10}$ emissions also result from brake and tire wear, as well as the re-entrainment of dust from paved and unpaved roads (referred to as fugitive dust).

Emission factors produced by the USEPA MOBILE6.2 model were used in conjunction with VMT data in order to estimate mobile source emissions for VOC (both exhaust and evaporative), NOx, and CO. Similarly, emission factors produced by the PART5 model were used in conjunction with VMT data to estimate PM_{10} emissions. MOBILE6.2 produces exhaust and evaporative emission factors for the following classes of vehicles: light duty gasoline vehicles (LDGV), light duty gasoline trucks 1 (LDGT1), light duty gasoline trucks 2 (LDGT2), heavy duty gasoline vehicles (HDGV), light duty diesel vehicles (LDDV), light duty diesel trucks (LDDT), heavy duty diesel vehicles (HDDV), and motorcycles. It also produces a composite emission factor for all vehicles based on the vehicle class mix supplied to the model. Inputs to the model include average vehicle speed, vehicle VMT mix, annual mileage accumulation rates and registration distributions by age, inspection and maintenance (UM) program information, fuel information, ambient temperature data, and others.

Both the MOBILE6.2 and PART5 models are typically used to support planning and modeling efforts in urban or regional areas, and include default inputs suited for these applications. Therefore it is suitable for applications over large, regional transportation networks. Application of the MOBILE6.2 model required the utilization of unique inputs that were representative of mobile source activity within the park. In particular, it was necessary to utilize unique inputs for the visitor vehicle class mix and the vehicle age distribution.

The Center for Environmental Research and Technology within the College of Engineering at the University of California's Riverside Campus (CE-CERT) established park-specific vehicle fleet characterizations in developing air emission inventories for Zion National Park (CE-CERT, 2001). CE-CERT found that the distribution of vehicle ages in the park reflected a larger fraction of newer vehicles than the overall model default vehicle age distribution. The vehicle fleet characterization developed by CE-CERT was applied in the mobile modeling for the Preserve.

In addition to VMT mix and age distribution, CE-CERT also established park-specific modeling inputs for driving pattern characterization. CE-CERT found that park driving patterns differ significantly from the default driving patterns typically used in mobile modeling, such as the Federal Test Procedure (FTP). In particularly, they found that the FTP reflects both higher

speeds and a wider range of speeds than observed in the parks. However, since the MOBILE6.2 model is not designed to readily incorporate unique driving pattern data, the default driving cycle remains the basis for the mobile source emission estimates provided here.

Other important mobile modeling inputs that can significantly affect mobile emission factors are the average speed, fuel characteristics, and UM program parameters. The average speed input to the mobile models was assumed to be 35 mph. The fuel volatility was assumed to be RVP 12.1 (winter) and 7.6 (summer), and reformulated gasoline was not assumed to be present.

In order to account for seasonal differences in mobile emissions, separate MOBILE6.2 runs were performed to produce emission factors for winter and summer. A composite emission factor for each season, reflecting a park specific VMT mix adapted from the CE-CERT data, served as the basis for mobile source emission estimates. Additional particulate emissions (or entrained road dust) from vehicles operating on paved roads also were calculated based on VMT. A summary of visitor vehicle emissions is provided in Table 13.

3.1.2 Visitor Off-Road Vehicles

The 1974 enabling legislation allows for the use of off-road vehicles (ORV) within the preserve. The use of ORVs is a very popular recreational activity within the Preserve, and the NPS has taken several steps to manage their use. These include requiring an annual permit for ORV use; limiting the annual number of permits to 2,000 as recommended in the 1991 General Management Plan (BICY 1991); restricting ORVs to designated trails in certain parts of the Preserve; prohibiting ORVs in some areas; and prohibiting the use of tracked vehicles throughout the Preserve. Recently, the Preserve completed a Final EIS to manage the use of ORVs in the Preserve (BICY 2000)

Four general types of ORVs operate in the Preserve: 1) street-legal four-wheel drive vehicles; 2) lightweight all terrain cycles; 3) swamp buggies; and 4) airboats. Some summary information on these ORVs is provided in Table 9.

TABLE 9. ORVs OPERATING IN BIG CYPRESS NATIONAL PRESERVE

ORV Type	Operating Limitations	**Weight (lbs)**	**Percent of NPS Permits**
Street-Legal Four-Wheel Drive Vehicles	Very restricted range on mostly dry surfaces	4,430	18
All Terrain Cycles	Limited carrying capacity and clearance	400-600	39
Swamp Buggies	Less restricted than other ORVs	3,600	30
Airboats	Restricted to deeper water areas than other ORVs		13

There are approximately 70 informal access points for ORVs. A mid- I990s study of aerial photos indicated a network of linear features total approximately 29,000 miles. However, these may include linear features other than ORV trails, and active and abandoned trails were indistinguishable. ORV user surveys indicate that hunting is the principal recreational activity and that most ORV users visit the Preserve often. One recent survey indicated that 60 percent had visited 10 or more times in a one year period, and the average trip lasted 2 or 3 days.

Since few site-specific data, other than annual permits, on ORVs exist, national emission data were averaged and applied to the permitted number. Specifically, the USEPA developed a Nonroad Emissions Model to compute nationwide emission levels for a variety of nonroad engines and vehicles.' The average annual emissions per off-road recreational vehicle were then applied to an assumed fleet of 2,000 ORVs to estimate visitor ORV emissions in the Preserve. A summary of visitor ORV emissions is provided in Table 13.

3.2 GSA/NPS Highway and Nonroad Vehicles

The Preserve operates a fleet of 50 highway vehicles that are owned by the NPS or leased from the General Services Administration (GSA). Since average vehicle mileages were not readily available, an estimated 10,000 miles per year, which is in the range for vehicles operated by other park units, was assumed. A summary of Preserve highway vehicle emissions is provided in Table 13.

The NPS also owns and operates nonroad motorized equipment that is used to maintain roads and grounds and for other purposes. There are records of the Preserve equipment inventory, and the larger pieces of equipment are noted in Table 10. Since there are no data regarding its usage,

l U.S. Environmental Protection Agency. *2000. Emission Modeling for Recreational Vehicles.* Office of Air and Radiation. 13 November.

default values for emission factors and annual usage were derived from the USEPA Nonroad emission database (EPA, 1991) and used to calculate annual emissions, which also are provided in Table 13.

TABLE 10: NPS NONROAD VEHICLES AT THE PRESERVE

Vehicle Type	Number	**Annual Usage (hrs/yr each)**
Utility Cart/Bobcat	15	75
Forklift	1	175
Backhoe	2	660
Grader	2	100
Roller/Compactor	1	17
Tractor	5	80
Loader	2	80
Chipper	1	60
Dozer	1	300

' Estimated

3.3 AIRCRAFT

The Preserve operates one Cessna 172 fixed-wing aircraft and a Bell Jet Ranger III helicopter from an airfield near the Oasis Visitor Center area. There are also three active, private, backcountry airstrips on the Preserve, but there are no data available on their usage. Air emissions from the NPS-controlled aircraft were estimated using the Federal Aviation Administration (FAA) Emissions and Dispersion Modeling System (EDMS), which calculates emissions using procedures prescribed by the USEPA. Aircraft emissions are a function of several operating modes that constitute a landing and take-off (LTO) cycle. These modes include taxi-out, takeoff, climb, approach, landing, and taxi-in. For each type of aircraft engine, there are data for the average duration, fuel consumption, and emission factor for each mode of operation within the LTO cycle. These data are multiplied to calculate emissions of each pollutant for each engine and are then multiplied by the number of LTO cycles per year. According to park officials, the Cessna makes about 600 LTOs a year and the Bell Ranger 450 LTOs per year. Aircraft emission data are summarized in Table 11.

TABLE 11: AIRCRAFT EMISSIONS AT BIG CYPRESS NATIONAL PRESERVE

Aircraft	**LTOs**	PM_{10} (lb/yr)	SO_2 (Ib/yr)	**NO,, (Ib/yr)**	**CO (lb/yr)**	**VOC** (lb/yr)
Cessna 172	600		--'	14	4,440	114
Bell Ranger Helicopter	450	'	--'	124	180	16
	Total	--'	--'	138	4,620	130

1 The model does not calculate these emissions

3.4 MARINE VESSELS

The NPS operates six airboats that are based at the Loop Road Education Center in the southeastern area of the Preserve. Park officials indicated that the boats are powered by 4-stroke, 180-hp gasoline engines and that they are operated a total of approximately 1,000 hours per year. Airboat emission data are summarized in Table 12.

TABLE 12: BIG CYPRESS NATIONAL PRESERVE MARINE VESSEL EMISSIONS

Vessels	No. **of** Boats	**Engine power**	**Hours of** Operation	**HC (lb/yr)**	CO (Ib/yr)	**NO„** (Ib/yr)	**PM** (lb/yr)	SOZ (Ib/yr)
Air Boats	6	180	1,000	434	10,860	403	5	

3.3 SUMMARY OF MOBILE SOURCE EMISSIONS

Table 13 summarizes the mobile source emissions for road and nonroad vehicles and equipment operating in The Preserve in 2000.

TABLE 13: SUMMARY OF 2000 MOBILE SOURCE EMISSIONS AT THE BIG CYPRESS NATIONAL PRESERVE

Activity	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		VOCs	
	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr	lbs/yr	tons/yr
Road Vehicles										
Visitor Vehicles	12,755'	6.38			16,770	8.38	208,962	104.48	13,646	6.82
GSA/NPS Road Vehicles	942'	0.47			2,490	1.25	16,500	8.25	967	0.48
Road Vehicle Emission Subtotal	13,697'	6.85			19,260	9.63	225,462	112.73	14,613	7.31
Nonroad Vehicles										
Visitor Off-Road Vehicles	3,413	1.71			13,000	6.50	*2,578,700*	1,289.35	357,760	178.88
NPS Nonroad Vehicles	520	0.26			1,188	0.59	3,841	1.92	1,730	0.86
NPS Aircraft					138	0.07	4,620	2.31	130	0.07
NPS Patrol Boats	5	<0.01			403	0.20	10,860	5.43	434	0.22
Nonroad Vehicle Emission Subtotal	3,938	1.97			14,729	7.37	*2,598,021*	1,300	360,054	180.03

Totals

Totals	Particulates		Sulfur Dioxide		Nitrogen Oxides		Carbon Monoxide		VOCs	
	lbs/ r	M."A								tons/ r
	17,635	8.82					*2,823,483*	1,412	374,667	187.33

' Includes exhaust PM_{io} and road dust

4. BIG CYPRESS NATIONAL PRESERVE AND REGIONAL EMISSIONS

4.1 BIG CYPRESS NATIONAL PRESERVE SUMMARY

A summary of Big Cypress N Pres emissions is provided in Table 14.

TABLE 14: ESTIMATED ANNUAL EMISSIONS FROM BIG CYPRESS N PRES

Source	PM_{10} (tons/yr)	SO_2 (tons/yr)	NO_X (tons/yr)	CO (tons/yr)	VOCs (tons/yr)
Point Sources					
Heating Equipment	<0.01		0.03	<0.01	<0.01
Generators	<0.01	0	0.07	0.01	<0.01
Gasoline Storage Tanks	--	--	--	--	0.72
Subtotal	<0.01	0	0.10	0.02	0.73
Area Sources					
Prescribed Burning	1,780	--	--	18,600	870
Subtotal	1,780	--	--	18,600	870
Oil and Gas Operations					
Separator Column Heaters	0.16	0.01	2.10	1.76	0.12
Generators	--	0.01	56.63	24.33	4.20
Subtotal	0.16	0.03	58.73	26.09	4.31
Mobile' Sources					
Road Vehicles	6.85	--	9.63	112.73	7.31
Nonroad Vehicles	1.97	--	7.37	1,300	180.03
Subtotal	8.82	--	17.00	1,412	187.33
Totals					
Totals	1,782	0.03	75.83	20,038	1,062

[I] As methane

4.2 REGIONAL AIR EMISSIONS

Emission estimates for Collier, Dade, and Monroe Counties and the state of Florida were obtained from the 1999 National Emission Inventory (NEI) maintained by USEPA. It is important to note that differences may exist between the methodologies used to generate the preserve emission inventory and those used to generate the NEI. For example, gasoline storage tanks have been included as stationary sources for the Preserve, while the NEI treats them as area sources. The majority of the NO_x and SO2 emissions generated by point sources in Dade County are attributable to electric utility and industrial fuel burning. Table 15 provides a comparison of the Preserve emissions with those from the surrounding counties and the State of Florida.

TABLE 15: ESTIMATED ANNUAL EMISSIONS FROM BIG CYPRESS N PRES, SURROUNDING COUNTIES, AND THE STATE OF FLORIDA

Area	PM10 (tons/yr)	SO_2 (tons/yr)	NO_x (tons/yr)	CO (tons/yr)	VOC (tons/yr)
Point Sources					
Big Cypress N Pres	<0.01	0	0.10	0.02	0.73
Collier County	2	86	67	40	65
Dade County	1,111	16,828	*17,746*	2,098	1,993
Monroe County	14	12	254	65	6
Surrounding Counties	1,127	16,926	18,067	2,203	2,064
Florida	23,225	820,475	373,354	74,422	27,154
Area Sources					
Big Cypress N Pres	1,780	--	--	18,600	870
Collier County	6,379	128	178	8,046	3,418
Dade County	13,913	11,828	5,477	11,117	38,193
Monroe County	873	70	97	509	1,468
Surrounding Counties	21,165	12,026	5,752	19,672	43,079
Florida	204,469	38,115	61,110	979,936	376,162
Mobile Sources					
Big Cypress N Pres	8.82	--	17.00	1,412	187.33
Collier County	5,339	1,144	12,641	87,127	9,530
Dade County	27,660	8,220	80,098	612,833	63,400
Monroe County	3,219	534	4,659	52,285	14,601
Surrounding Counties	36,218	9,898	97,398	752,245	87,531
Florida	341,20	65.103	678,983	4,808,725	543,028

5. COMPLIANCE AND RECOMMENDATIONS

5.1 COMPLIANCE

The majority of the Preserve is located in Collier County, FL, and there are small portions in Monroe and Dade Counties, FL. The Florida Department of Environmental Protection (DEP) Division of Air Resource Management administers the state's air pollution program, and the South District office in Fort Myers is the local contact for Collier County Park. Park personnel should coordinate with the agency on permit issues relating to stationary sources, as well as prescribed burning activities (see Appendix D for selected air quality regulations). Prior to replacing or adding relatively large heating units, generators, and fuel storage tanks, the Florida Administrative Code (F.A.C.) should be consulted regarding the need to obtain a permit to construct or a permit to operate such sources. According to the F.A.C. Rule 62-210.300(3)(c), current general exemptions to these permits include:

- Fuel burning equipment of less than 10 million Btu per hour heat input
- Emergency generators that consume less than 32,000 gallons of diesel fuel per year.

According to F.A.C. Rule 62-256.700, open burning, under certain conditions, is allowed for:

- Camp fires, bonfires, or other fires used solely for recreational purposes
- Flaring of waste gases as long as excessive visible emissions are not generated
- Firefighting training

All three counties are in attainment for all national and state ambient air quality standards (AAQS) except that the entire state is designated as "not classifiable" for particulate matter (PM10) since the statewide monitoring network for PM_{10} has not operated long enough to classify it as attainment or nonattainment. Only Dade County is classified as attainment/maintenance for ozone. Maintenance areas are areas previously classified as nonattainment, but which have successfully reduced air pollution concentrations to below the standard, but must maintain some of the nonattainment area plans to remain in compliance with the standard.

5.2 RECOMMENDATIONS

With respect to point sources, the natural gas-fired heaters and generators used by the oil and gas field operations are the most significant in the Preserve. Although there are few opportunities

beyond limiting the number of sources or their operating times to reduce these emissions, the oil and gas operators should be made aware of their contributions to the Preserve's total point source emissions. They should also be made aware that a good maintenance program to keep the equipment operating at optimal efficiency is very important to minimizing emissions, particularly CO and VOC emissions. These operations may also be phased out in the near future since the NPS 2004 budget request includes $40 million to acquire a portion of the mineral rights underlying the Preserve from its private owners (NPS 2003).

Opportunities to reduce NOx and VOC emissions, which are the precursors for ozone formation, are related to the reduction or replacement of conventional fossil fuels. Actions to promote sustainable development in the design, retrofit, and construction of park facilities have associated air quality benefits. These include actions that reduce or replace consumption of conventional fossil fuels and/or reduce the consumption of other resources. Reductions in potable and non-potable water consumption also achieve concurrent reductions in energy consumption and associated air emissions. Acquisition of energy efficient appliances whenever possible also is an incremental energy saving measure that has associated air quality benefits.

An energy and water conservation audit would assist in deteiiiiining possible retrofits for energy and water savings opportunities. Possible energy savings opportunities include the use of solar energy for water heating and automatic setbacks on air conditioning equipment. For example, the air conditioning units in the exterior offices at the Ochopee Headquarters building operate continuously unless the occupant shuts the unit off when leaving.

The largest source of mobile emissions in the Preserve is the visitor ORVs. Fortunately, the steps that the Preserve has historically taken to manage these vehicles, also reduces air emissions. These steps include limiting the number of permits annually, requiring inspections of the ORVs as a condition of granting a permit, and requiring permit holders to complete an operator's course. In the future, if the number of annual permits remains the same, emissions from these vehicles will begin to decline. In 2001, the USEPA proposed new emission regulations for ATVs and other off-road recreational vehicles, and they will be applicable to new manufactured vehicles in the next few years. Manufacturers may choose to meet them by using four-stroke engines instead of two-stroke engines, changing the air-fuel mixture, or using a technology such as advanced fuel injection or catalytic converters on some models to meet the new regulations. Although these regulations will not apply to existing ORVs, cleaner models will begin to enter the fleet as older models are retired.

6. REFERENCES

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APPENDIX A

FUEL DATA AND EMISSION FACTORS

FUEL DATA

Fuel	Heating Value	Sulfur Content
No. 2 Distillate Fuel Oil/Diesel	140,000 Btu/gal	0.05% by weight
Natural Gas	1,050 Btu/ft'	2,000 grains/] ^{06} ft^3
Propane	91,500 Btu/gal	0.18 grains/ 100 ft^3

STATIONARY SOURCE EMISSION FACTORS - BOILERS/HEATING UNITS

DISTILLATE OIL (DF-2) - CRITERIA POLLUTANTS

Combustor Type	Emission Factor (lb/1,000 gal fuel burned)				
	PM[a]	S02[b]	NO,.(`)	CO	VOC[d]
Residential Furnace[e]	0.4	142S	18	5	0.713
Boilers < 100 Million Btu/hr (Commercial/Institutional Combust.[f])	2	142S	20	5	0.34
Boilers < 100 Million Btu/hr (Industrial Boilers[g])	2	1425	20	5	0.2
Boilers > 100 Million Btu/hr (Utility Boilers)	2	157S	24	5	--

Source: AP-42, 5th Edition, Supplements A, B, C, D, and E; Tables 1.3-1 and 1.3-3.

NATURAL GAS - CRITERIA POLLUTANTS

Combustor Type (MMBtu/hr Heat Input)	Emission Factor (lb/10^6 ft^3 fuel burned)				
	PMO[j]	SO_2	NO.(`)	CO	VOC
Residential Furnaces (<0.3)					
-Uncontrolled	7.6	0.6	94	40	5.5
Tangential-Fired Boilers (All Sizes)					
-Uncontrolled	7.6	0.6	170	24	5.5
-Controlled-Flue gas recirculation	7.6	0.6	76	98	5.5
Small Boilers (<100)					
-Uncontrolled	7.6	0.6	100	84	5.5
-Controlled-Low NO,, burners	7.6	0.6	50	84	5.5
-Controlled-Low NO,, burners/Flue gas recirculation	7.6	0.6	32	84	5.5
Large Wall-Fired Boilers (>100)					
-Uncontrolled (Pre-NSPS)[k]	7.6	0.6	280	84	5.5
-Uncontrolled (Post-NSPS)[k]	7.6	0.6	190	84	5.5
-Controlled-Low NO,, burners	7.6	0.6	140	84	5.5
-Controlled-Flue gas recirculation	7.6	0.6	100	84	5.5

Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Tables 1.4-1 and 1.4-2.

STATIONARY SOURCE EMISSION FACTORS - BOILERS/HEATING UNITS (Continued)

PROPANE (LPG) - CRITERIA POLLUTANTS					
Combustor Type	Emission Factor (lb/1,000 al fuel burned)				
	PM[a]	SO2[3]	NO,[e]	CO	VOC[d]
Commercial Boilers[t0]	0.4	0.105	14	1.9	0.3
Industrial Boilers[s]	0.6	0.10S	19	3.2	0.3
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 1.5-1.					

STATIONARY SOURCE EMISSION FACTORS - GENERATORS

For generators rated at less than or equal to 448 kW (600 hp):

	Emission Factor (lb/h -hr				
Fuel Type	PM	SO_X	NO,,	CO	VOC
DF-2	2.20 E-03	2.05 E-03	0.031	6.68 E-03	2.51 E-03
Gasoline	7.21 E-04	5.91 E-04	0.011	0.439	0.022
Natural Gas/Propane	1.54 E-04	7.52 E-03(S)	3.53 E-03	8.6 E-04	1.92 E-04
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 3.3-1 and 3.1-1					

For generators rated at greater than 448 kW (600 hp):

Fuel Type	Emission Factor (lb/hp-hr)				
	PM	SO_X	NO,	CO	VOC
DF-2	0.0007	(8.09 E-03)S	0.024	5.5 E-03	6.4 E-04
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 3.4-1.					

FIREPLACE EMISSION FACTORS

Fuel Type	Emission Factor (lb/ton)				
	PMu	SO,	NO_X[o]	CO	VOC
Wood	34.6	0.4	2.6	252.6	229.0
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E. Table 1.9-1.					

WOODSTOVE EMISSION FACTORS

Stove Type	Emission Factor (lb/ton)				
	PMO[1]	So,,	NO,,(`)	CO	VOC
Conventional	30.6	0.4	2.8	230.8	53
Noncatalytic	19.6	0.4	--	140.8	12
Catalytic	20.4	0.4	2.0	104.4	15
Source: AP-42, 5th Edition, Supplements A, B, C, D, and E, Table 1.10-1.					

STATIONARY SOURCE EMISSION FACTORS - SURFACE COATING OPERATIONS

Surface Coating Type	VOC Emission Factor (lb/gal)
Paint: Solvent Base	5.6
Paint: Water Base	1.3
Enamel: General	3.5
Lacquer: General	6.1
Primer: General	6.6
Varnish/Shellac: General	3.3
Thinner: General	7.36
Adhesive: General	4.4
Source: *Calculation Methods for Criteria Air Pollutant Emission Inventories,* AL/OE-TR-1994-0049, July 1994. Armstrong Laboratory.	

(a) PM = Filterable Particulate Matter.

(b) These factors must be multiplied by the fuel sulfur content (for example, if the sulfur content is 0.05%, then S equals 0.05).

(c) Expressed as NO_2.

(d) Emission factors given in AP-42 are actually for non-methane total organic compounds (NMTOC) which includes all VOCs and all exempted organic compounds (such as ethane, toxics and HAPs, aldehydes and semivolatile compounds) as measured by EPA reference methods.

(e) Unit Rating <300,000 Btu/hr.

(f) Unit Rating 3300,000 Btu/hr, but <10,000,000 Btu/hr.

(g) Unit Rating 310,000,000 Btu/hr, but <100,000,000 Btu/hr.

(h) Unit Rating 3100,000,000 Btu/hr.

(i) POM = Particulate POM only.

(j) PM = Filterable Particulate Matter + Condensible Particulate Matter.

(k) NSPS = New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction, modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction, modification, or reconstruction after June 19, 1984.

(1) Emission factors are given on a fuel input basis (lb/MMBtu). To convert to a power output basis (lb/hp-hr), use an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr.

APPENDIX B

EMISSION CALCULATIONS

2000 ACTUAL CRITERIA EMISSIONS FROM GENERATORS AT BIG CYPRESS NATIONAL PRESERVE

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM (lbs/yr)	SO, (lbs/yr)	NO, (lbs/yr)	CO (lbs/yr)	CO, (lbs/yr)	VOC (lbs/yr)
Generator	Oasis Fuel Island	Diesel	1	100	24	2,400	7	7	100	21	3,698	8
Generator	Oasis Radio Repeater	Diesel	1	15	24	360	1	1	15	3	555	1
Generator	Ochopee Headquarters	Diesel	1	20	24	480	1	1	20	4	740	2
Generator	Birdon Road	Diesel	1	5	24	120	0	0	5	1	185	0
Diesel Generator Totals			4				10	9	140	30	5,178	11
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

2000 POTENTIAL CRITERIA EMISSIONS FROM GENERATORS AT BIG CYPRESS NATIONAL PRESERVE

Emission Source	Location	Fuel	Number of Sources	Rating (kW)	Run Time (hrs/yr)	Output (kW-hr/yr)	PM (lbs/yr)	SO, (lbs/yr)	NO (lbs/yr)	CO (lbs/yr)	CO, (lbs/yr)	VOC (Ibs/yr)
Generator	Oasis Fuel Island	Diesel	1	100	500	50,000	147	137	2,077	448	77,050	168
Generator	Oasis Radio Repeater	Diesel	1	15	500	7,500	22	21	312	67	11,558	25
Generator	Ochopee Headquarters	Diesel	1	20	500	10,000	29	27	415	90	15,410	34
Generator	Birdon Road	Diesel	1	5	500	2,500	7	7	104	22	3,853	8
Diesel Generator Totals							206	192	2,908	627	107,870	235
Emission Factors from AP-42, Chapter 3.4-1 for generators rated less than 448 kW, S=.05							2.20E-03	0.00205	3.10E-02	6.68E-03	1.15E+00	2.51E-03
Formula = Output (kW-hr/yr) * 1.34 (hp/kW) * Emission Factor (lb/hp-hr)												

2000 ACTUAL CRITERIA EMISSIONS FROM HEATING UNITS AT **BIG CYPRESS** NATIONAL PRESERVE

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)	Consumption (gal/yr)	PM" (lbs/yr)	SO, (Ibs/yr)	NO, (lbs/yr)	CO (lbs/yr)	CO, (lbs/yr)	VOC (lbs/yr)
Furnace	Ochopee Headquarters	Propane	1	100,000	4,380	2	0	61	8	54,750	1
		Propane Totals	1	100,000	4,380	2	0	61	8	54,750	1
Emission Factors from AP-42, Tables 1.5-1 for commercial boilers, S=0.18 grains/100 cu ft						0.4	0.1 *S	14	1.90	12,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)											

2000 POTENTIAL CRITERIA EMISSIONS FROM HEATING UNITS AT BIG CYPRESS NATIONAL PRESERVE

Emission Source	Location	Fuel	Number of Sources	Capacity (Btu/hr)	Consumption (gal/yr)	PM_{10} (lbs/yr)	SO_2 (lbs/yr)	NO, (lbs/yr)	CO (lbs/yr)	CO, (lbs/yr)	VOC (Ibs/yr)
Furnace	Ochopee Headquarters	Propane	1	100,000	9,574	4	0	134	18	119,672	3
		Propane Totals	1	100,000	9,574	4	0	134	18	119,672	3
Emission Factors from AP-42, Tables 1.5-I for commercial boilers, S=0.18 grains/ 100 cu ft						0.4	0.1*S	14	1.90	12,500	0.3
Formula = Consumption (gal/yr) * Emission Factor (lb/1,000 gal)											

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Ochopee Headquarters
City:	Miami
State:	Florida
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	5.50
Diameter (ft):	4.00
Volume (gallons):	500.00
Turnovers:	0.00
Net Throughput (gal/yr):	950.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mat, Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	77.97	73.65	82.28	75.91	6.4901	5.9914	7.0214	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Annual Emission Calculations	
Standing Losses (lb):	107.3181
Vapor Space Volume (cu ft):	44.0223
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.1496
Vented Vapor Saturation Factor:	0.5924
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	44.0223
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.2939
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	5.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Daily Avg. Liquid Surface Temp. (deg. R):	537.6375
Daily Average Ambient Temp. (deg. F):	75.8917
Ideal Gas Constant R (psia cult / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	535.5817
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sgft day):	1,537.3318
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1496
Daily Vapor Temperature Range (deg. R):	17.2537
Daily Vapor Pressure Range (psia):	1.0300
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9914
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.0214
Daily Avg. Liquid Surface Temp. (deg R):	537.6375
Daily Min. Liquid Surface Temp. (deg R):	533.3241
Daily Max. Liquid Surface Temp. (deg R):	541.9509
Daily Ambient Temp. Range (deg. R):	13.8000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.5924
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	9.8357
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Annual Net Throughput (gal/yr.):	950.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	117.1537

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	9.84	107.32	117.15

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Oasis Fuel Station
City:	Miami
State:	Florida
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	5.30
Volume (gallons):	2,000.00
Turnovers:	1.90
Net Throughput (gal/yr):	3,800.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 9)	All	77.97	73.65	82.28	75.91	6.4901	5.9914	7.0214	67.0000			92.00	Option 4: RVP=9, ASTM Slope=3

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Annual Emission Calculations	
Standing Losses (lb):	362.9949
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.1496
Vented Vapor Saturation Factor:	0.5231
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Daily Avg. Liquid Surface Temp. (deg. R):	537.6375
Daily Average Ambient Temp. (deg. F):	75.8917
Ideal Gas Constant R (psia cult / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	535.5817
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,537.3318
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1496
Daily Vapor Temperature Range (deg. R):	17.2537
Daily Vapor Pressure Range (psia):	1.0300
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9914
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.0214
Daily Avg. Liquid Surface Temp. (deg R):	537.6375
Daily Min. Liquid Surface Temp. (deg R):	533.3241
Daily Max. Liquid Surface Temp. (deg R):	541.9509
Daily Ambient Temp. Range (deg. R):	13.8000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.5231
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	39.3426
Vapor Molecular Weight (lb/lb-mole):	67.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.4901
Annual Net Throughput (gal/yr.):	3,800.0000
Annual Turnovers:	1.9000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	402.3376

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	39.34	362.99	402.34

TANKS 4.0
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Oasis Fuel Station AVGAS
City:	Miami
State:	Florida
Company:	NPS
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	5.30
Volume (gallons):	2,000.00
Turnovers:	4.29
Net Throughput (gal/yr):	8,576.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	All	77.97	73.65	82.28	75.91	0.0146	0.0128	0.0167	130.0000			162.00	Option 5: A=12.39, B=8933

TANKS 4.0
Emissions Report - Detail Format
Detail Calculations (AP-42)

Annual Emission Calculations	
Standing Losses (lb):	0.5724
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0003
Vapor Space Expansion Factor:	0.0283
Vented Vapor Saturation Factor:	0.9980
Tank Vapor Space Volume	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0003
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0146
Daily Avg. Liquid Surface Temp. (deg. R):	537.6375
Daily Average Ambient Temp. (deg. F):	75.8917
Ideal Gas Constant R (psia cult / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	535.5817
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sgft day):	1,537.3318
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0283
Daily Vapor Temperature Range (deg. R):	17.2537
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0146
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0128
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0167
Daily Avg. Liquid Surface Temp. (deg R):	537.6375
Daily Min. Liquid Surface Temp. (deg R):	533.3241
Daily Max. Liquid Surface Temp. (deg R):	541.9509
Daily Ambient Temp. Range (deg. R):	13.8000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9980
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0146
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.3881
Vapor Molecular Weight (lb/lb-mote):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0146
Annual Net Throughput (gal/yr.):	8,576.0000
Annual Turnovers:	4.2880
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.9605

TANKS 4.0
Emissions Report - Detail Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	0.39	0.57	0.96

TITLE: Results of FOFEM model execution on date: 2/14/2003

FUEL CONSUMPTION CALCULATIONS

Region: Interior West
Cover Type: SAF/SRM - SRM 110 - Ponderosa Pine Grasslands
Fuel Type: Natural
Fuel Reference: FOFEM 011

FUEL CONSUMPTION TABLE

Fuel Component Name	Preburn Load (t/acre)	Consumed Load (t/acre)	Postburn Load (t/acre)	Percent Reduced (%)	Equation Reference Number	Moisture
Litter	1.40	1.40	0.00	100.0	999	
Wood (0-1/4 inch)	0.07	0.07	0.00	100.0	999	
Wood (1/4-1 inch)	0.63	0.63	0.00	100.0	999	25.0
Wood (1-3 inch)	0.80	0.32	0.48	39.4	999	
Wood (3+ inch) Sound	4.50	0.32	4.18	7.1	999	20.0
3->6	1.12	0.17	0.95	0.2		
6->9	1.12	0.09	1.04	0.1		
9->20	1.12	0.04	1.08	0.0		
20->	1.12	0.02	1.11	0.0		
Wood (3+ inch) Rotten	0.50	0.10	0.40	19.1	999	20.0
3->6	0.12	0.05	0.08	0.4		
6->9	0.12	0.03	0.10	0.2		
9->20	0.12	0.01	0.11	0.1		
20->	0.12	0.01	0.12	0.1		
Duff	5.00	2.05	2.95	41.1	2	100.0
Herbaceous	0.50	0.45	0.05	90.0	221	
Shrubs	0.10	0.06	0.04	60.0	23	
Crown foliage	6.00	0.00	6.00	0.0	37	
Crown branchwood	0.70	0.00	0.70	0.0	38	
Total Fuels	20.20	5.39	14.81	26.7		

FIRE EFFECTS ON FOREST FLOOR COMPONENTS

Forest Floor Component	Preburn Condition	Amount Consumed	Postburn Condition	Percent Reduced	Equation Number
Duff Depth (in)	0.6	0.2	0.4	30.8	6
Min Soil Exp (%)	.0	21.9	21.9	21.9	10

Note:
'Duff' (tons/acre) and 'Duff Depth (in)' burned are computed using different equations, sometimes this may cause an inconsistancy in the 'Percent Reduced' shown on this report.
Duff (tons/acre) consumed is best suited for predicting smoke production, while Duff Depth (in) may be better related to fire severity and soil heating

	Emissions -- lbs/acre flaming	smoldering	total
PM 10	12	185	197
PM 2.5	10	157	167
CH 4	3	95	98
CO	25	2088	2113
CO 2	6875	8501	15376

	Consumption tons/acre	Duration hour:min:sec
Flaming:	1.93	00:01:00
Smoldering:	3.46	00:22:15

TITLE: Results of FOFEM model execution on date: 2/14/2003

FUEL CONSUMPTION CALCULATIONS

Region: Interior West
Cover Type: SAF/SRM - SRM 613 Fescue Grassland
Fuel Type: Natural
Fuel Reference: SMFDB 335

FUEL CONSUMPTION TABLE

Fuel Component Name	Preburn Load (t/acre)	Consumed Load (t/acre)	Postburn Load (t/acre)	Percent Reduced (%)	Equation Reference Number	Moisture
Litter	0.00	0.00	0.00	0.0	999	
Wood (0-1/4 inch)	0.00	0.00	0.00	0.0	999	
Wood (1/4-1 inch)	0.00	0.00	0.00	0.0	999	25.0
Wood (1-3 inch)	0.00	0.00	0.00	0.0	999	
Wood (3+ inch) Sound	0.00	0.00	0.00	0.0	999	20.0
3->6	0.00	0.00	0.00	0.0		
6->9	0.00	0.00	0.00	0.0		
9->20	0.00	0.00	0.00	0.0		
20->	0.00	0.00	0.00	0.0		
Wood (3+ inch) Rotten	0.00	0.00	0.00	0.0	999	20.0
3->6	0.00	0.00	0.00	0.0		
6->9	0.00	0.00	0.00	0.0		
9->20	0.00	0.00	0.00	0.0		
20->	0.00	0.00	0.00	0.0		
Duff	0.00	0.00	0.00	0.0	2	100.0
Herbaceous	1.56	1.40	0.16	90.0	221	
Shrubs	0.00	0.00	0.00	0.0	23	
Crown foliage	0.00	0.00	0.00	0.0	37	
Crown branchwood	0.00	0.00	0.00	0.0	38	
Total Fuels	1.56	1.40	0.16	90.0		

FIRE EFFECTS ON FOREST FLOOR COMPONENTS

Forest Floor Component	Preburn Condition	Amount Consumed	Postburn Condition	Percent Reduced	Equation Number
Duff Depth (in)	0.0	0.0	0.0	0.0	6
Min Soil Exp (%)	.0	21.9	21.9	21.9	10

	Emissions -- lbs/acre flaming	smoldering	total
PM 10	9	0	9
PM 2.5	7	0	7
CH 4	2	0	2
CO	18	0	18
CO 2	4994	0	4994

	Consumption tons/acre	Duration hour:min:sec
Flaming:	1.40	00:01:00
Smoldering:	0.00	00:00:00
Total:	1.40	

2000 PRESCRIBED AND WILDFIRE EMISSIONS AT BIG CYPRESS NATIONAL PRESERVE

Fire Type	Fuel Type	Acres	PM_{10} (lbs/yr)	$PM_{2.5}$ (lbs/yr)	CH_4 (lbs/yr)	CO (lbs/yr)	CO_2 (lbs/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CH_4 (tons/yr)	CO (tons/yr)	CO_2 (tons/yr)
Wildland	Pine	15,400	3,033,800	2,571,800	1,509,200	32,540,200	236,790,400	1,517	1,286	755	16,270	118,395
Prescribed Burns	Pine	17,500	3,447,500	2,922,500	1,715,000	36,977,500	269,080,000	1,724	1,461	858	18,489	134,540
	Grass	12,444	111,996	87,108	24,888	223,992	62,145,336	56	44	12	112	31,073
	Totals	29,944	3,559,496	3,009,608	1,739,888	37,201,492	331,225,336	1,780	1,505	870	18,601	165,613
Park Totals		45,344	6,593,296	5,581,408	3,249,088	69,741,692	568,015,736	3,297	2,791	1,625	34,871	284,008

Emission Factors (lbs/acre)

Pine	197	167	98	2,113	15,376
Grass	9	7	2	18	4,994

2000 ACTUAL CRITERIA EMISSIONS FROM OIL EMULSION SEPARATORS

Emission Source	Location	Fuel	Number of Sources	Consumption (cf/yr)	Consumption (gal/yr)	PM (lbs/yr)	S02 (Ibs/yr)	NOX (Ibs/yr)	CO (lbs/yr)	VOC (lbs/yr)
Heaters	Oil Fields	Natural Gas	1	41,950,000		319	25	4,195	3,524	231
Emission Factors from AP-42, Tables 1.4-1 and 1.4-2 for small boilers						7.6	0.6	100.0	84.0	5.5

Formula = Consumption (cf/yr) * Emission Factor (lb/1,000,000 cf)

2000 ACTUAL **CRITERIA EMISSIONS FROM OIL** & GAS OPERATIONS NATURAL GAS GENERATORS

Emission Source	Location	Fuel	Number of Sources	Input (cu ft/yr)	PM (Ibs/yr)	SO_2 (lbs/yr)	NO_x (lbs/yr)	CO (lbs/yr)	VOC (lbs/yr)
Generator	Oil Fields	Natural gas	1	41,950,000	0	26	113,265	48,662	8,390
Emission Factors from AP-42, Chapter 3.1-4 for natural gas large uncontrolled gas reciprocating engines					0.00E+00	6.27E-04	2.70E+00	1.16E+00	2.00E-01

Formula = Emission Factor (lb/1,000,000 Btu) * Input (cu ft * 1,000 Btu/cu ft)

```
 # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
 Big Cypress NPr Winter Conditions.
 File 1, Run 1, Scenario 7.
 # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #
 M584 Warning:
           The user supplied area wide average speed of 35.0
           will be used for all hours of the day. 1000 of VMT
           has been assigned to a fixed combination of freeways,
           freeway ramps, arterial/collector and local roadways
           for all hours of the day and all vehicle types.

 Reading PM Gas Carbon ZML Levels
 from the external data file PMGZML.CSV

 Reading PM Gas Carbon DR1 Levels
 from the external data file PMGDR1.CSV

 Reading PM Gas Carbon DR2 Levels
 from the external data file PMGDR2.CSV

 Reading PM Diesel Zero Mile Levels
 from the external data file PMDZML.CSV

 Reading the First PM Deterioration Rates
 from the external data file PMDDR1.CSV

 Reading the Second PM Deterioration Rates
 from the external data file PMDDR2.CSV

         User supplied gasoline sulfur content = 300.0 ppm.

 M616 Comment:
              User has supplied post-1999 sulfur levels.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:   2001
                           Month:   Jan.
                        Altitude:   Low
             Minimum Temperature:   62.0 (F)
```

Maximum Temperature: 74.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 12.1 psi
Weathered RVP: 12.0 psi
Fuel Sulfur Content: 299. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: No
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.104	1.200	1.069	1.144	0.848	0.382	0.420	0.248	2.20	1.126
Composite CO	16.21	20.39	19.40	19.97	9.47	1.136	0.803	2.676	10.93	16.668
Composite NOX :	0.732	1.012	1.188	1.087	4.041	1.267	1.214	16.505	1.34	1.142

	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Composite VOC :	1.142	1.218	1.046	1.118	1.825	0.386
Composite CO	19.38	20.70	19.27	19.70	3.124	0.746
Composite NOX :	0.794	1.079	1.072	1.442	2.602	1.180

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGVS	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Composite Emission Factors (g/mi):								
Composite VOC :	0.848	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	9.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Composite NOX :	4.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B

VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.184	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	0.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite NOX :	4.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000

- #
- Big Cypress NPr Summer Conditions.
- File 1, Run 1, Scenario 8.
- #

M584 Warning:

The user supplied area wide average speed of 35.0 will be used for all hours of the day. 100% of VMT has been assigned to a fixed combination of freeways, freeway ramps, arterial/collector and local roadways for all hours of the day and all vehicle types.

- Reading PM Gas Carbon ZML Levels
- from the external data file PMGZML.CSV

- Reading PM Gas Carbon DR1 Levels
- from the external data file PMGDR1.CSV

- Reading PM Gas Carbon DR2 Levels
- from the external data file PMGDR2.CSV

- Reading PM Diesel Zero Mile Levels
- from the external data file PMDZML.CSV

- Reading the First PM Deterioration Rates
- from the external data file PMDDR1.CSV

- Reading the Second PM Deterioration Rates
- from the external data file PMDDR2.CSV

User supplied gasoline sulfur content = 300.0 ppm.

M616 Comment:

User has supplied post-1999 sulfur levels.

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year:	2001
Month:	July
Altitude:	Low
Minimum Temperature:	78.0 (F)
Maximum Temperature:	87.0 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	7.6 psi
Weathered RVP:	7.3 psi
Fuel Sulfur Content:	299. ppm
Exhaust I/M Program:	No
Evap I/M Program:	No
ATP Program:	No
Reformulated Gas:	No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.675	0.815	0.823	0.818	0.553	0.358	0.442	0.239	2.21	0.744
Composite CO	11.58	13.93	13.87	13.91	6.62	1.121	0.825	2.642	12.72	11.967
Composite NOX :	0.752	0.999	1.265	1.112	4.477	1.170	1.240	16.262	1.21	1.156

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Composite VOC :	0.778	0.826	0.806	0.860	1.893	0.412
Composite CO	13.54	14.05	13.79	14.06	3.247	0.775
Composite NOX :	0.792	1.062	1.141	1.540	2.621	1.212

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT **Mix**:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.553	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	6.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Composite NOX :	4.477	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite CO	0.794	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Composite NOX :	3.998	0.000	0.000	0.000	0.000	0.000	0.000	0.000

# #
Big Cypress NPr Winter Conditions.
File 1, Run 1, Scenario 7.
I #

Calendar Year: 2001
Month: Jan.
Gasoline Fuel Sulfur Content: 299. ppm
Diesel Fuel Sulfur Content: 500. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000				0.0000	0.0000
GAS PM:	0.0042	0.0047	0.0044	0.0046	0.0523	------	------	------	0.0205	0.0050
ECARBON:	------	------	------	------	------	0.1244	0.0488	0.1250		0.0024
OCARBON:	------	------	------	------	------	0.0351	0.0703	0.0997	------	0.0019
S04:	0.0028	0.0049	0.0047	0.0048	0.0118	0.0049	0.0106	0.0540	0.0010	0.0043
Total Exhaust PM:	0.0071	0.0096	0.0091	0.0094	0.0640	0.1644	0.1297	0.2786	0.0215	0.0136
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0115	0.0040	0.0080
Total PM:	0.0276	0.0302	0.0297	0.0300	0.0846	0.1849	0.1503	0.3027	0.0380	0.0341
S02:	0.0684	0.0804	0.1134	0.0944	0.1603	0.0939	0.2028	0.7715	0.0328	0.0872
NH3:	0.1016	0.1005	0.1015	0.1009	0.0451	0.0068	0.0068	0.0270	0.0113	0.0970
Idle Emissions (g/hr)										
PM Idle:								1.0557	------	0.0190

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016
Composite Emission Factors (g/mi):						
Lead:	0.0000	0.0000	0.0000	0.0000		
GASPM:	0.0047	0.0047	0.0044	0.0044		
ECARBON:	------	------	------	------	0.1498	0.0464
OCARBON:	------	------	------	------	0.2156	0.0668

S04:	0.0049	0.0049	0.0047	0.0047	0.0062	0.0107
Total Exhaust PM:	0.0096	0.0096	0.0091	0.0091	0.3717	0.1238
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
Total PM:	0.0302	0.0302	0.0297	0.0297	0.3922	0.1444
S02:	0.0804	0.0804	0.1134	0.1134	0.1196	0.2049
NH3:	0.1005	0.1005	0.1015	0.1015	0.0068	0.0068

Idle Emissions (g/hr)

PM Idle:

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GAS PM:	0.0523	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
ECARBON:								
OCARBON:								
S04:	0.0118	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.0640	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.0846	0.0523	0.0503	0.0504	0.0503	0.0503	0.0503	0.0000
S02:	0.1603	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0451	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Idle Emissions (g/hr)

PM Idle:

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Lead:	------							
GASPM:	------	------	------	------	------	------		
ECARBON:	0.0514	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OCARBON:	0.0535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S04:	0.0172	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.1221	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total PM:	0.1426	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S02:	0.2452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0270	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idle Emissions (g/hr)								
PM Idle:	1.0617	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

k #
k Big Cypress NPr Summer Conditions.
k File 1, Run 1, Scenario 8.
k #

Calendar Year: 2001
Month: July
Gasoline Fuel Sulfur Content: 299. ppm
Diesel Fuel Sulfur Content: 500. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.7002	0.1410	0.1044		0.0060	0.0008	0.0016	0.0180	0.0280	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0042	0.0046	0.0044	0.0045	0.0523	------	------	------	0.0205	0.0050
ECARBON:			------		------	0.1192	0.0485	0.1160	------	0.0023
OCARBON:			------		------	0.0336	0.0698	0.0926	------	0.0018
S04:	0.0028	0.0049	0.0047	0.0048	0.0120	0.0049	0.0106	0.0540	0.0010	0.0042
Total Exhaust PM:	0.0070	0.0095	0.0091	0.0093	0.0643	0.1576	0.1289	0.2626	0.0215	0.0133
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0116	0.0040	0.0080
Total PM:	0.0276	0.0300	0.0297	0.0299	0.0848	0.1782	0.1494	0.2867	0.0380	0.0338
S02:	0.0684	0.0804	0.1134	0.0944	0.1601	0.0929	0.2031	0.7714	0.0328	0.0872
NH3:	0.1016	0.1007	0.1015	0.1010	0.0451	0.0068	0.0068	0.0270	0.0113	0.0970
Idle Emissions (g/hr)										
PM Idle:								1.0472	------	0.0189

Veh. Type:	LDGT1	LDGT2	LDGT3	LDGT4	LDDT12	LDDT34
VMT Mix:	0.0330	0.1080	0.0719	0.0325	0.0000	0.0016

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	------	------
GASPM:	0.0046	0.0046	0.0044	0.0044	------	------
ECARBON:	------	------	------	------	0.1498	0.0464
OCARBON:	------	------	------	------	0.2156	0.0668
S04:	0.0049	0.0049	0.0047	0.0047	0.0062	0.0107
Total Exhaust PM:	0.0095	0.0095	0.0091	0.0091	0.3717	0.1238
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080
Total PM:	0.0300	0.0300	0.0297	0.0297	0.3922	0.1444
S02:	0.0804	0.0804	0.1134	0.1134	0.1196	0.2049
NH3:	0.1007	0.1007	0.1015	0.1015	0.0068	0.0068

Idle Emissions (g/hr)

PM Idle:	------	------	------	------	------	------

Veh. Type:	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B
VMT Mix:	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GASPM:	0.0523	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
ECARBON:	------	------	------	------	------	------	------	
OCARBON:	------	------	------	------	------	------	------	
S04:	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.0643	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.0848	0.0523	0.0506	0.0506	0.0506	0.0506	0.0505	0.0000
S02:	0.1601	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0451	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Idle Emissions (g/hr)

PM Idle:	------	------	------	------	------	------	------	

Veh. Type:	HDDV2B	HDDV3	HDDV4	HDDVS	HDDV6	HDDV7	HDDV8A	HDDV8B
	------	------	------	------				
VMT Mix:	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Composite Emission Factors (g/mi):

GASPM:					------	------	------	------

ECARBON:	0.0503	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
OCARBON:	0.0523	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S04:	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Exhaust PM:	0.1198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Brake:	0.0125	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tire:	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PM:	0.1403	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S02:	0.2450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3:	0.0270	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Idle Emissions (g/hr)								
PM Idle:	1.0504	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

BIG CYPRESS NATIONAL PRESERVE VISITOR VEHICLE EMISSIONS

Annual VMT
6,634,043

Emission Factors (g/mi) - All Vehicles

					PM_{10} (Paved)	
	NO_x	**CO**	**VOC**	**Exhaust, Brake, and** Tire	Fugitive	**Total**
Summer	1.156	11.967	0.744	0.0338	0.84	0.8738
Winter	1.142	16.668	1.126	0.0341	0.84	0.8741
Average	1.149	14.318	0.935			0.874

Emissions (tons/yr) - All Vehicles

NO_x	**CO**	**VOC**	**Paved PM_{10}**
8.38	104.48	6.82	6.38

Emissions (lbs/yr) - All Vehicles

NO_x	CO	VOC	**Paved** PM10
16,770	208,962	13,646	12,755

BIG CYPRESS NATIONAL PRESERVE NPS AND GSA VEHICLES

	LDGV	LDGT	LDDT	HDDV	Total
Total Miles	20,000	420,000	0	40,000	480,000

Emission Factors (9/mi) - LDGV

	NO_x	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	0.7520	11.5800	0.6750	0.0276	0.8400	0.8676
Winter	0.7320	16.2100	1.1040	0.0276	0.8400	0.8676
Average	0.7420	13.8950	0.8895			0.8676

Emissions (tonslyr) - LDGV

NOx	CO	VOC	PM_{10}
0.02	0.31	0.02	0.02

Emission Factors (g/mi) - LDGT

	NO_x	CO	VOC	PM_{10} Exhaust, Brake, and Tire	PM_{10} Fugitive	PM_{10} Total
Summer	1.112	13.910	0.818	0.030	0.840	0.870
Winter	1.087	19.970	1.144	0.030	0.840	0.870
Average	1.100	16.940	0.981			0.870

Emissions (tons/yr) - LDGT

NO_x	CO	VOC	PM_{10}
0.51	7.83	0.45	0.40

Emission Factors (g/mi) - LDDT

	NOx	CO	VOC	PM" Exhaust, Brake, and Tire	PM" Fugitive	PM" Total
Summer	1.239	0.945	0.461	0.149	0.840	0.989
Winter	1.212	0.931	0.439	0.150	0.840	0.990
Average	1.226	0.938	0.450			0.990

Emissions (tonslyr) - HDGV

NO_x	CO	VOC	PM_{10}
0.00	0.00	0.00	0.00

Emission Factors (9/mi) - HDDV

	NOx	CO	VOC	PM10 Exhaust, Brake, and Tire	PM10 Fugitive	PM10 Total
Summer	16.262	2.642	0.239	0.287	0.840	1.127
Winter	16.505	2.676	0.248	0.303	0.840	1.143
Average	16.384	2.659	0.244			1.135

Emissions (tons/yr) - HDDV

NO_x	CO	VOC	PM_{10}
0.72	0.12	0.01	0.05

Emissions (tons/yr) - Total

NO_x	CO	VOC	PM10
1.25	8.25	0.48	0.47

Emissions (lbs/yr) - Total

NO_x	CO	VOC	PM_{10}
2,490	16,498	967	942

BIG CYPRESS NATIONAL PRESERVE
VISITOR OFF-ROAD VEHICLE EMISSIONS

Total ATVs	**NO_X**	**CO**	**VOC**	PM_{10}
3,800,000				
1,196,000				
1,567,000				
6,563,000	21,300	4,231,000	587,000	5,600
		tonslyr		
2,000	6.49	1,289.35	178.88	1.71
		lbs/yr		
	12,982	2,578,699	357,763	3,413

BIG CYPRESS NATIONAL PRESERVE MARINE VESSEL EMISSIONS

Diesel Engine Emission Factors'

Units	HC	CO	NO,	PM	SO_2
(g/hp-hr)	1.26	1.91	8.92	0.563	0.352
(lb/hp-hr)	0.003	0.004	0.020	0.001	0.001

1 g = 0.0022016 lbs
BSFC = 0.367 lb/hp-hr

' Source: Exhaust Emission Factors for Nonroad Engine Modeling -- Compression-Ignition EPA Report No., NR-009A; Table 1

2-Stroke Gasoline Engine Emission Factors[3]

Units	HC	CO	NO,	PM	SO_2
(g/hp-hr)	19	242	8.2	7.7	0.000
(lb/hp-hr)	0.042	0.533	0.018	0.017	0.000

4-Stroke Gasoline Engine Emission Factors [3]

Units	HC	CO	NO,	PM	SO_2
(g/hp-hr)	5.22	130.5	4.847	0.06	0.000
(lb/hp-hr)	0.011	0.287	0.011	0.000	0.000

[3] Source: Nonroad Emission Inventory Model, Draft, June 17, 1998

Criteria Pollutant Emissions[3]

Location	NPS Vessels	No. of Boats	Engine Power (hp)	Hours of Operation	Load Factor	HC (lb/yr)	CO (lb/yr)	NO, (lb/yr)	PM (lb/yr)	SO_2 (lb/yr)
Education Center	Air Boats	6	180	1,000	0.21	434	10,860	403	5	0
						(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
						0.22	5.43	0.20	0.00	0.00

[3] Emissions = Emission Factor' Engine Power * Hours of Operation * Load Factor

2000 BIG CYPRESS N PRES NONROAD VEHICLE EMISSIONS

		Emission Factors (gm/hp-hr)							Emissions (lbslyr)			
Vehicle	No.	PM	Nox	CO	VOC	hp	load	hrs/yr	PM	Nox	CO	VOC
Utility Cart	15	2.04	1.03	2.31	2.19	15	0.55	75	41.7	21.0	47.2	44.7
Tractors	5	2.04	1.03	2.31	2.19	42.35	0.68	80	51.7	26.1	58.5	55.5
										0.0	0.0	
Backhoe	2	2.04	1.03	2.31	2.19	77	0.55	660	250.9	126.7	284.1	269.3
Riding Mower	0	1.11	10.3	4.8	1.3	15	0.55	60	0.0	0.0	0.0	0.0
Brush Mower	0	1.11	10.3	4.8	1.3	15	0.55	40	0.0	0.0	0.0	0.0
Bobcat	0	2.04	1.03	2.31	2.19	15	0.55	300	0.0	0.0	0.0	0.0
Dozer	1	2.04	1.03	2.31	2.19	77	0.55	300	57.0	28.8	64.6	61.2
Grader	2	1.06	9.6	3.8	1.43	172	0.61	100	48.9	443.2	175.4	66.0
Power Pruner	0	3.99	0.9	4.8	1.3	5	0.55	600	0.0	0.0	0.0	0
Stihl Brushcutters	0	3.99	0.9	4.8	1.3	5	0.55	600	0.0	0.0	0.0	0.0
Stihl 14 Quick Cut Saw	0	3.99	0.9	4.8	1.3	5	0.55	100	0.0	0.0	0.0	0.0
Post Hole Digger	0	3.99	0.9	4.8	1.3	5	0.55	400	0.0	0.0	0.0	0.0
Case Plate Tamper	0	3.99	0.9	4.8	1.3	5	0.55	300	0.0	0.0	0.0	0.0
Tamper Rammer	0	3.99	0.9	4.8	1.3	5	0.55	100	0.0	0.0	0.0	0.0
Pionjar	0	3.99	0.9	4.8	1.3	5	0.55	600	0.0	0.0	0.0	0.0
Wacker Trash Pump	0	3.99	0.9	4.8	1.3	5	0.55	100	0.0	0.0	0.0	0.0
Generators	0	3.99	0.9	4.8	1.3	5	0.55	165	0.0	0.0	0.0	0.0
Welder-Arc-Generator	0	3.99	0.9	4.8	1.3	5	0.55	100	0.0	0.0	0.0	0.0
Emglo Air Compressor	0	3.99	0.9	4.8	1.3	5	0.55	400	0.0	0.0	0.0	0.0
Sweeper	1	1.7	14	6.06	1.46	30	0.68	120	9.2	75.4	32.6	7.9
Leaf Blowers	0	3.99	0.9	4.8	1.3	1.2	0.55	15	0.0	0.0	0.0	0.0
Chainsaws	0	3.6	0.96	4.8	1.3	3	0.55	1600	0.0	0.0	0.0	0.0
Trimmer	0	3.99	0.9	4.8	1.3	1.2	0.55	300	0.0	0.0	0.0	0
Weed Wacker	0	3.99	0.9	4.8	1.3	1.2	0.55	0	0.0	0.0	0.0	0
50 gallon Sprayer	0	1.7	14	6.06	1.46	9	0.55	1000	0.0	0.0	0.0	0
Forklift	1	1.06	9.6	3.8	1.43	172	0.61	175	42.8	387.8	153.5	57.8
Front End Loader	0	1.11	10.3	4.8	1.3	77	0.55	630	0.0	0.0	0.0	76
Roller/Compactor	1	2.04	1.03	2.31	2.19	30	0.55	17	1.3	0.6	1.4	1
Skid Loader	1	1.11	10.3	4.8	1.3	77	0.55	80	8.3	76.8	35.8	9.7
Chipper	1	3.99	0.9	1372	495	30	0.55	60	8.7	2.0	2988.2	1078
Crane	0	1.06	9.6	3.8	1.43	172	0.61	175	0.0	0.0	0.0	0.0
Snowplow	0	1	8	5	1.22	210	0.65	130	0.0	0.0	0.0	0.0
							Totals:	(lbs/yr)	520	1,188	3,841	1,728
								(tons/yr)	0.26	0.59	1.92	0.86

4/19/02

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	HC	NOx	SOX	PM10
Cessna 150	0-200	TAXI	.153	.007	.000	.000	.000
essna 150	0-200	TKOF	.066	.001	.000	.000	.000
Cessna 150	0-200	CLMB	1.096	.024	.006	.000	.000
<essna 150	0-200	APCH	.905	.025	.001	.000	.000
tjessna 150	0-200	APU	.000	.000	.000	.000	.000 .
essna 150	0-200	GSE	.000	.000	.000	.000	.000
-550A Stallion	PT6A-27	TAXI	.000	.000	.000	.000	.000
H-550A Stallion	PT6A-27	TKOF	.001	.000	.006	.000	.000
I-550A Stallion	PT6A-27	CLMB	.004	.000	.026	.002	.000
H-550A Stallion	PT6A-27	APCH	.085	.008	.030	.002	.000
-550A Stallion	PT6A-27	APU	.000 _	.000	.000	.000	.000
H-550A Stallion	PT6A-27	GSE	.000	.000	.000	.000	.000

" Denotes User Created Aircraft

EDMS 3.23 Emissions Inventory Report

Study Name: Big Cypress

Airport: Oasis

Report Date: 04/09/02

SUMMARY

(Tons/Year)

NAME	Co	HC	NOx	sox	PM10
Aircraft	2.310	.065	.069	.004	.000
GSE/AGE/APU	.000	.000	.000	.000	.000
Total	2.310	.065	.069	.004	.000

APPENDIX C

PUBLIC USE DATA

Park Visitation Report

Big Cypress NPres					
Month	**Year**	**Recreation Visits**	**Non-Recreation Visits**	**Total Visits**	
January	2001	45,361	0	45,361	
February	2001	46,126	0	46,126	
March	2001	43,613	0	43,613	
April	2001	31,626	0	31,626	
May	2001	24,520	0	24,520	
June	2001	27,828	0	27,828	
July	2001	25,544	0	25,544	
August	2001	20,476	0	20,476	
September	2001	28,114	0	28,114	
October	2001	24,719	0	24,719	
November	2001	45,686	0	45,686	
December	2001	46,158	0	46,158	
Totals:		409,771	0	409,771	

~OD)

Interpretive Statistics:

Visitor Center	127,926 visitors
Movie at VC	22,361 visitors attended
Interpretive Programs	2,546 visitors
Roving Ranger	1,390 informal contacts with visitors
Environmental Education Programs	2,338 students
Community Outreach Programs	7,066 attendees
Website Hits	93,008 hits
ORV Permits Sold	1,900
ORV inspections	2,143
ORV Operator's Licenses (all of whom took the operator's orientation course)	2,400 ORV operators

total visitation for 2001 was 464,383

APPENDIX D

SELECTED FLORIDA AIR QUALITY REGULATIONS

(a) Categorical Exemptions.

1. One or more fossil fuel steam generators and hot water generating units located within a single facility; collectively having a total rated heat input equaling 100 million BTU per hour or less; and collectively burning annually no more than 145,000 gallons of fuel oil containing no more than 1.0 percent sulfur, or no more than 290,000 gallons of fuel oil containing no more than 0.5 percent sulfur, or an equivalent prorated amount of fuel oil if multiple fuels are used, provided none of the generators or hot water generating units is subject to the Federal Acid Rain Program or any standard or requirement under 42 U.S.C. section 7411 or 7412.

2. Any individual fossil fuel steam generator and hot water generating unit with a rated heat input equaling 100 million BTU per hour or less and burning annually no more than 150 million standard cubic feet of natural gas or no more than one million gallons of propane or no more than one million gallons of fuel oil containing no more than 0.05 percent sulfur, or an equivalent prorated amount if multiple fuels are used, provided:

a. The total annual fuel consumption for all units exempted by Rules 62-210.300(3)(a)2. and 3., F.A.C., at a facility does not exceed 375 million standard cubic feet of natural gas or 2.5 million gallons of propane or 2.5 million gallons of fuel oil containing no more than 0.05 percent sulfur, or an equivalent prorated amount if multiple fuels are used and;

b. The unit is not subject to the Federal Acid Rain Program or any *standard* or requirement under 42 U.S.C. section 7411 or 7412.

3. One or more fossil fuel steam generators and hot water generating units located within a single facility, collectively having a total rated heat input equaling 10 million BTU per hour or less, and fired exclusively by natural gas or propane, provided:

a. During periods of natural gas curtailment, only propane or fuel oil containing no more than 1.0 percent sulfur is fired; and,

b. None of the generators or hot water heating units is subject to the Federal Acid Rain Program or any standard or requirement under 42 U.S.C. section 7411 or 7412.

4. Home heating and comfort heating with a gross maximum heat output of less than one million Btu per hour.

5. Internal combustion engines in boats, aircraft and vehicles used for transportation of passengers or freight.

6. Incinerators in one or two family dwellings or in multi-family dwellings containing four or less family units, one of which is owner-occupied.

7. Noncommercial and nonindustrial vacuum cleaning systems used exclusively for residential housekeeping purposes.

8. Cold storage refrigeration equipment, except for any such equipment located at a Title V source using an ozone-depleting substance regulated under 40 C.F.R. Part 82.

9. Vacuum pumps in laboratory operations.

10. Equipment used for steam cleaning.

11. Belt or drum sanders having a total sanding surface of five square feet or less and other equipment used exclusively on wood or plastics or their products having a density of 20 pounds per cubic foot or more.

12. Equipment used exclusively for space heating, other than boilers.

13. Noncommercial smoke houses used exclusively for smoking food products.

14. Bakery ovens located at any retail bakery facility which derives at least fifty percent of its revenues from retail sales on premises. Also, bakery ovens located at any commercial bakery facility utilizing only non-conveyor belt ovens operating on a single baking cycle in which a determinate amount of product is cooked at one baking (i.e., batch ovens).

15. Laboratory equipment used exclusively for chemical or physical analyses.

16. Brazing, soldering or welding equipment.

17. Laundry dryers, extractors, or tumblers for fabrics cleaned with only water solutions of bleach or detergents.

18. Petroleum dry cleaning facilities with a solvent consumption of less than 3,250 gallons per year.

19. Portable air curtain incinerators except any air curtain incinerator intended to be continuously operated at one site for more than six months or at any Department-permitted landfill for any length of time; provided:

a. Only land clearing debris or clean dry wood is burned;

b. Pit width, length, and side walls are properly maintained so that combustion of the waste within the pit is maintained at an adequate temperature and with sufficient air recirculation to provide enough residence time and mixing for complete combustion and control of emissions. Pit width shall not exceed twelve (12) feet, and vertical side walls shall be maintained;

c. No waste is positioned to be burned above the level of the air curtain in the pit;

d. Visible emissions do not exceed 40 percent opacity except for up to 30 minutes during periods of startup and shutdown;

e. The air curtain incinerator is located at least 300 feet away from any occupied building if it has refractory-lined walls and forced underdraft air or otherwise at least 1,000 feet away from any occupied building; and

f. The burning is ignited after 9:00 a.m. and extinguished at least one hour before sunset, except that, in the case of an air curtain incinerator with refractory-lined walls and forced underdraft air which is located at least 1,000 feet away from any off site occupied building, the burning may commence at sunrise, and the air curtain incinerator may be charged until sunset provided it does not create a nuisance.

20. One or more emergency generators located within a single facility provided:

a. None of the emergency generators is subject to the Federal Acid Rain Program; and

b. Total fuel consumption by all such emergency generators within the facility is limited to 32,000 gallons per year of diesel fuel, 4,000 gallons per year of gasoline, 4.4 million standard cubic feet per year of natural gas or propane, or an equivalent prorated amount if multiple fuels are used.

21. One or more heating units, general purpose internal combustion engines, or other combustion devices, all of which are located within a single facility, are not listed elsewhere in Rule 62-210.300(3)(a), F.A.C., and are not pollution control devices, provided:

a. None of the heating units, general purpose internal combustion engines, or other combustion devices that would be exempted is subject to the Federal Acid Rain Program;

b. Total fuel consumption by all such heating units, general purpose internal combustion engines, and other combustion devices that would be exempted is limited to 32,000 gallons per year of diesel fuel, 4,000 gallons per year of gasoline, 4.4 million standard cubic feet per year of natural gas or propane, or an equivalent prorated amount if multiple fuels are used; and

c. Fuel for the heating units, general purpose internal combustion engines, and other combustion devices that would be exempted is limited to natural gas, diesel fuel, gasoline and propane.

22. Fire and safety equipment.

23. Surface coating operations within a single facility if the total quantity of coatings containing greater than 5.0 percent VOCs, by volume, used is 6.0 gallons per day or less, averaged monthly, provided:

a. Such operations are not subject to a volatile organic compound Reasonably Available Control Technology (RACT) requirement of Chapter *62-296, F.A.C.;* and

b. The amount of coatings used shall include any solvents and thinners used in the process including those used for cleanup.

24. Surface coating operations utilizing only coatings containing 5.0 percent or less VOCs, by volume.

25. Phosphogypsum cooling ponds and inactive phosphogypsum stacks which have demonstrated compliance with the requirements of 40 C.F.R. Part 61, Subpart R, hereby adopted and incorporated by reference.

26. Degreasing units using heavier-than-air vapors exclusively, except any such unit using or emitting any substance classified as a hazardous air pollutant.

CHAPTER 62-256 OPEN BURNING AND FROST PROTECTION FIRES

62-256.100 Declaration and Intent.

(1) The Department finds and declares that the open burning of materials outdoors and the use of outdoor heating devices result in or contribute to air pollution. The Department further finds that regulation of open burning and outdoor heating devices will reduce air pollution significantly.

(2) It is the intent of the Department to require that open burning be conducted in a manner, under conditions, and within certain periods that will reduce or eliminate the deleterious and noisome effect of air pollution caused by open burning.

(3) It is the intent of the Department to phase out, over a period of years, open burning of certain unapproved material and heating devices which are presently being used for crop protection against frost and freezing and to require that only materials and heating devices which emit a minimum of air pollution be used.

(4) The Department finds that certain fuels release less air pollution when burned than do other fuels. Therefore, the Department intends to approve fuels which contribute only a minimum of air pollution and allow their use for cold or frost protection and to phase out, over a period of years, all fuels which do not meet Department specifications.

(5) The Department finds that there are several alternative disposal methods for pesticide containers that are environmentally preferable to open burning. It is the intent of the department that individuals seeking to dispose of pesticide containers as provided in this chapter consider recycling, landflling, on-site burial, and incineration prior to engaging in open burning.

Specific Authority 403.061(7) FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 7-30-85, Formerly 17-5.01, 17-5.001, 17-256.100.

62-256.200 Definitions.

The following words, phrases, or terms when used in this chapter shall, unless the content otherwise indicates, have the following meanings:

(1) "Air curtain incinerator" is a portable or stationary combustion device that directs a plane of high velocity forced draft air through a manifold head into a pit with vertical walls in such a manner as to maintain a curtain of air over the surface of the pit and a recirculating motion of air under the curtain. An air curtain incinerator is controlled burning as defined in Florida Administrative Code Rule 62-701.300(3).

(2) "Air pollution" is the presence in the outdoor atmosphere of the state of any one or more substances or contaminants in quantities which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property, or unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

(3) "Air pollution episode" is any occurrence of elevated levels of pollutants in the atmosphere which require hasty and unusual abatement action.

(4) "Approved fuel" shall mean fuel approved by the Department to emit or release a minimum of pollutants when burned.

(5) "Clean dry wood" means wood (including lighter pine), lumber or tree and shrub trunks, branches, and limbs which are free of paint, pentachlorophenol, creosote, tar, asphalt, or other wood preservatives and which when burned does not emit excessive visible emissions.

(6) "Department" is the DepaiIinent of Environmental Protection.

(7) "Department air stagnation advisory" is a temporary prohibition of open burning activities by the Department that is based upon a Department forecast of a stagnant atmospheric meteorological condition that does not allow the dispersion of air pollutants.

(8) "Excessive visible emissions" are air pollutants emitted in such quantity as to obscure an observer's view to a degree equal to or greater than Number Two (or 40% opacity) on the Ringelmann Smoke Chart as published in the U.S. Bureau of Mines Information Circular No. 7718.

(9) "Extinguished" means the absence of any visible flames, smoke or emissions.

(10) "Garbage" means all kitchen and table food waste, animal or vegetative waste that is attendant with or results from the storage, packaging, preparation, cooking or handling of food materials.

(11) "Group I containers" means combustible containers which formerly contained organic or metallo-organic pesticides, except organic mercury, lead, cadmium, or arsenic compounds.

(12) "Land clearing debris" is uprooted or cleared vegetation resulting from a land clearing operation and does not include yard trash.

(13) "Land clearing operation" means the uprooting clearing of vegetation in connection with construction for buildings, rights-of-way, residential, commercial, or industrial development, or the initial clearing of vegetation to enhance property value; but does not include the maintenance burning of yard trash resulting from fallen limbs, branches, or leaves, or any other routine property clean-up activities.

(14) "National Weather Service air stagnation advisory" is an advisory issued by the National Weather Service to caution local and regional agencies of meteorological conditions which are conducive to poor dispersion and that are expected to persist for at least 36 hours.

(15) "Non-rural land clearing" is any land clearing operation that is conducted in urban or residential areas, incorporated or unincorporated cities or towns, or in any nonrural areas as designated by the Department and shall not include any land clearing operation that is associated with country, livestock or with agricultural activities.

(16) "Nuisance" means any open burning activity which is potentially harmful or injurious to human health or property or which is annoying or offensive to occupants of three or more occupied residences.

(17) "Open burning" means the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney.

(18) "Open field" means any location in a well ventilated cleared area that is at least 200 feet in all directions from any wooded area or occupied building(s), and 100 feet from any public road.

(19) "Outdoor heating device" means any apparatus, machine, equipment, or other contrivance in which is burned any type of fuel capable of producing air pollution, used outdoors for the purpose of giving protection from cold or frosts.

(20) "Pesticide" means any substance or mixture substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, or other forms of plant or animal life or viruses, except viruses or fungi on or in living man or other animals, which the Department of Agriculture and Consumer Services shall declare to be a pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

(21) "Residential land clearing" is a land clearing operation that is conducted by the homeowner or an individual contracted by the homeowner *of* an existing residential dwelling *of* not more than two family units for the purpose *of* initially clearing vegetation on the property.

(22) "Sunset" is official sunset as set forth by the U.S. Naval Observatory (tables are available at National Weather Service offices).

(23) "Trash" means construction or demolition debris, and other debris such as paper, cardboard, cloth, glass, street sweepings, vehicle tires and other like matter.

(24) "Waste pesticide containers" means any containers made of combustible materials, including but not limited to paper, plastic, or burlap, which formerly contained pesticides and which the manufacturer or formulator provided as an end user conveyance for the specified product.

(25) "Yard trash" means vegetative matter resulting from landscaping and yard maintenance operations and includes materials such as tree and shrub trimmings, grass clippings, palm fronds, trees and tree stumps.

Specific Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 1-11-82, 7-30-85, Formerly 17-5.02, Amended 10-20-86, Formerly 17-5.020, 17-256.200, Amended 11-30-94.

62-256.300 Prohibitions.

(1) Any open burning not specifically allowed by this chapter or by Florida Administrative Code Chapter 51-2 is prohibited. No person shall ignite, cause to be ignited, permit to be ignited, any material which will result in any prohibited open burning as defined in this section; nor shall any person suffer, allow, burn, conduct or maintain any prohibited open burning. The Division of Forestry or any authorized fire control agency empowered by law or ordinance to extinguish unlawful burning may extinguish or cause to be extinguished, any fire that is unauthorized or does not comply with this rule. Any person responsible for unlawful open burning shall bear any applicable costs involved in extinguishing the fire.

(2) No person shall use or operate any outdoor heating device or burn any unapproved fuel for cold or frost protection except as provided in this chapter.

(3) The open burning of tires, rubber material, Bunker C residual oil, asphalt, roofing material, tar, railroad cross ties, other creosoted lumber, plastics except for polyethelene black plastic mulch used in agriculture, garbage, or trash other than yard trash and household paper products is prohibited. Open burning of yard trash and household paper products is prohibited except as provided in Florida Administrative Code Rule 62-256.700(1). Open burning of waste pesticide containers is prohibited except as provided in Florida Administrative Code Rule 62-256.700(6).

(4) Any open burning that is allowed by this chapter such as the burning of waste pesticide containers, yard trash, and land clearing debris is restricted to the site where the material was generated and may not be transported to another property to be open burned, with the following exceptions:

(a) Land clearing debris that is generated by the commercial land clearing activities of a person may be transported offsite to be burned by an Air Curtain Incinerator that is owned or operated by that person and without a Florida Administrative Code Rules 62-210 air pollution permit provided that it:

1. Will be transported to property that is owned or leased by the person who generated the land clearing debris, and
2. Meets a setback distance of 300 feet from occupied buildings for Air Curtain Incinerators with vertical refractory-lined walls and with forced underdraft air, or
3. Meets a setback distance of 1000 feet from occupied buildings for all other Air Curtain Incinerators.

(b) Land clearing debris generated from the activities of one or more persons may be transported offsite to be burned by an Air Curtain Incinerator with an appropriate Department air pollution permit.

(5) Open burning within one thousand (1000) feet of any active runway of a Department of Transportation approved public airport is prohibited. The Division of Forestry or any fire control agency authorized by law or ordinance to extinguish unlawful burning may extinguish or cause to be extinguished, any open burning that is within one thousand (1000) feet of an active airport runway that reduces or potentially reduces visibility at the airport.

(6) Open burning in particulate and ozone nonattainment areas as specified in Florida Administrative Code Rule 62-275 or in the area of influence as defined in Florida Administrative Code Rule *62-296* may be temporarily suspended when the Department determines that ambient air concentrations of total suspended particulate or ozone may near or exceed the primary or secondary standards for these pollutants.

(7) No open burning may be conducted during a National Weather Service Air Stagnation Advisory, a Department Air Stagnation Advisory, an Air Pollution Episode, or if the Division of Forestry determines that weather conditions are unfavorable for safe burning.

(8) Open burning which reduces visibility on public roadways to less than one thousand (1,000) feet is prohibited.

(9) Nothing in this chapter may be construed to allow open burning which violates other laws, rules, regulations, or ordinances.

Specific Authority 403.061(7) FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 1-11-82, 7-30-85, Formerly 17-5.03, Amended 10-20-86, 8-26-87, Formerly 17-5.030,17-256.300, Amended 11-30-94.

62-256.400 Agricultural and Silvicultural Fires.

Pursuant to section 8 of the Florida Environmental Reorganization Act, Chapter 75-22, Laws of Florida, 1975, this section has been transferred to the State of Florida Department of Agriculture and Consumer Services, Division of Forestry. (See Chapter 51-2, Florida Administrative Code.)

Specific Authority 403.061(3), (4), (7), (24), 403.081 FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Transferred to 51-2.06, 7-1-75, Formerly 17-5.05, 17-5.050, 17-256.400.

62-256.450 Burning for Cold or Frost Protection.

(1) Intent. The purpose of this rule is to allow the use of open burning and outdoor heating devices to prevent damage to agricultural products from cold and frost in a manner which provides the maximum protection to the quality of the ambient air in Florida. Furthermore, this rule will minimize air pollution by restricting the use of open fires and outdoor heating devices to times and temperatures when absolutely necessary to prevent cold damage.

(2) Approval. Open burning or the use of outdoor heating devices for frost or cold protection in connection with agricultural operations is allowed, provided the fuel and the heating device used have approval from the Environmental Regulation Commission prior to use, or have been authorized by the Secretary pursuant to Florida Administrative Code Rule 62-256.450(4).

(a) The following fuels are approved for use:

1. No. 2 diesel fuel
2. No. 2 fuel oil
3. Propane gas
4. Alcohol (ethanol or methanol)
5. Butane
6. Liquid petroleum gas
7. Petroleum coke
8. Charcoal
9. Clean dry wood
10. Methane

(b) The following heating devices are approved for use:

1. Spot heater - Spot heaters
2. HY LO Return Stack - Scheu Products Company
3. HY LO Large Cone - Scheu Products Company
4. Brader Heater - Brader Heaters, Inc.
5. Georges Heater - Georges Enterprises, Inc.
6. Agri-Heat Heater - Agri-Heat, Inc.

7. A conical heater- Fulton-Cole Seed Company
8. Orchard-Rite Heater - Orchard Rite, Ltd.
9. "Return Stack" 2000 used heaters approved for W. H. Clark Fruit Co.
10. Radiant Omni-Heater - New Draulics, Inc.
11. HY LO Lazy Flame Heater - Scheu Products Company
12. Sun Heater Model 2 - Fleming-Troutner Agricultural Heating, Inc.
13. Self Vaporizing Model M. B. S.-l -Burners, Inc.
14. HY LO Auto Clean Stack - Scheu Products Company
15. Mobil Tree Heat - Mobil Oil Corporation
16. Fireball - Sebring Forest Products

(c) Criteria for approval of new fuels:

Any person desiring to have a fuel approved for frost protection related open burning shall submit a petition to the Environmental Regulation Commission requesting that such fuel be added to Florida Administrative Code Rule 62-256.450(2)(a). The petition shall contain the following information:

1. Name, address, and telephone number of applicant;
2. Trade name or other designation of fuel;
3. Chemical composition of fuel;
4. The composition and quantity of air contaminants given off per unit of fuel; and
5. The expected rate of use of the fuel.

(d) Criteria for approval of new outdoor heating devices:

Any person desiring to have an outdoor heating device approved shall submit a petition to the Environmental Regulation Commission requesting that such device be added to Florida Administrative Code Rule 62-256.450(2)(b). The petition shall contain the following information:

1. Name, address and telephone number of applicant;
2. Trade name or other designation of the device;
3. Brief description of the device:
4. Type of fuel that is used in the device;
5. The composition and quantity of air contaminants; and
6. Evidence that the device does not emit more than five-tenths gram per minute of unconsumed solid carbonaceous matter or particulate matter.

(3) Operating Conditions. Open burning of approved fuels and the use of approved outdoor heating devices for frost or cold protection in connection with agricultural operations shall be in accordance with the following requirements:

(a) Open fires or outdoor heating devices for the protection of agricultural crops from cold or frost shall not be ignited until the ambient temperature drops to 32° F, except as provided in subsection (b), below.

(b) Open fires or outdoor heating devices for the protection of subtropical fruit, crops, and foliage such as mangos, papayas, etc., may be ignited at temperatures above 32° F if the threshold temperature for cold damage for that plant is higher.

(c) Temperature measurement for cold and frost protection burning shall be measured using a Standard Cotton Region Shelter or a Standard Fruit Frost Station.

(4) Exceptions.

(a) Although Florida Administrative Code Rule 62-256.450(1) through (3) are intended to provide adequate measures to conserve fuel, protect the atmosphere, and allow for protection of agricultural crops, hard to predict circumstances may require exceptions to this section. Therefore, the Secretary is authorized to grant exceptions and allow the use of heating devices and fuels not included on the published list in the event of prolonged cold weather and shortage of approved fuels.

(b) Exceptions may be granted to persons who possess approved heating devices and who had possessed sufficient approved fuels for at least 20 hours of burning provided that:

1. More than a total of 20 hours of temperatures of 25° F or lower has occurred during the season;
2. Sufficient approved fuels and clean dry wood are not available for adequate protection from cold or frost;
3. The burning of unapproved fuel is necessary to prevent irreparable damage to agricultural crops;
4. There is no forecast of a condition which might cause an air pollution episode as defined by Florida Administrative Code Rule 17-211.

(c) The Secretary shall make a public declaration and disseminate it to the news media when it is determined that an exception is necessary. The declaration shall include the following:

1. A list of the fuels that can be used and the conditions under which they can be used.
2. The pollution potential and possible adverse health effects.

(d) In no case shall the Secretary allow the burning of Bunker C residual oil, tires, rubber materials, asphalt, tar, railroad cross ties, other creosoted materials, or plastics, as fuel.

Specific Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 1-11-82, Formerly 17-5.06, Amended 10-20-86, Formerly 17-5.060, Amended 6-27-91, Formerly 17-256.450.

62-256.500 Land Clearing.

The following rules apply to non-rural land clearing open burning:

(1) Open burning of wooden material or vegetation generated by a land clearing operation (except for agricultural, silvicultural, or forestry operations) or the demolition of a structure is allowed provided that all of the following conditions are met:

(a) The open burning meets one of the following setback requirements:

1. Three hundred (300) feet or more away from any occupied building for residential land clearing, or

2. Three hundred (300) feet or more away from any occupied building if an Air Curtain Incinerator is used, or

3. One thousand (1,000) feet or more away from any occupied building if an Air Curtain Incinerator is not used.

(b) The open burning is setback one hundred (100) feet or more away from any public highway or road and the prevailing winds direct the smoke away from the public highway or road.

(c) The open burning is ignited after 9:00 a.m. and is extinguished one hour before sunset.

(d) The open burning is attended at all times.

(e) The open burning authorized herein is not intended to relieve any person from complying with any other applicable law, rules, or ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

(f) The piles of materials to be burned shall be of such size that the burning will be completed within the designated time given in paragraph 62-256.500(1)(c). This is not intended to relieve any person from complying with restrictions on size and numbers of piles imposed by the appropriate local fire control authorities.

(g) The moisture content and composition of the material to be burned shall be favorable to good burning which will minimize air pollution. Wet or green vegetative materials shall not be burned.

(h) The starter fuel and materials to be ignited shall not emit excessive visible emissions when burned. Tires or other prohibited materials listed in Florida Administrative Code Rule 62-256.300 shall not be used as starter fuels.

(i) The amount of dirt in a land clearing open burning operation shall be minimized to enhance combustion and reduce emissions.

(j) Prior to open burning for the demolition of a structure, all insulation, electrical wiring, linoleum, carpeting, roofing material such as tar paper and asphalt shingles, or other excessive smoke producing or potentially air toxic material shall be removed.

(2) The use of Air Curtain Incinerators is allowed for the combustion of land clearing debris. No Department permits are required for air curtain incinerators that are designed and used as portable units and that will not operate on any one site for more than six months in any year. This does not relieve any person from the requirement of obtaining authorization to use a portable Air Curtain Incinerator, when necessary, from the Division of Forestry, or any local fire control authority. Air Curtain Incinerators may operate as portable units provided that the following conditions are met:

(a) Pit width, length, and side walls shall be properly maintained so that the combustion of the waste within the pit will be maintained at an adequate temperature and with sufficient air recirculation to provide enough residence time and mixing for complete combustion and control of emissions. Pit width shall not exceed twelve (12) feet, and vertical side walls shall be maintained.

(b) No waste may be positioned to be burned above the level of the air curtain in the pit.

(c) The types of materials to be burned are restricted to land clearing debris. The Department shall authorize upon request the burning of wastes consisting only of clean dry wood used as defined in subsection 62-256.200(5), F.A.C.

(d) Excessive visible emissions are not allowed except for a period of up to 30 minutes during startups and shutdowns, as those terms are defined in Florida Administrative Code Rule 62-296.

(3) Air Curtain Incinerators that are intended to be stationary units, i.e. continuously operate at one site for more than six months, or operate at any Department-permitted landfill, must obtain a Department air pollution permit pursuant to Florida Administrative Code Rule 62-210.

(4) If the open burning resulting from a land clearing operation is creating a nuisance, or if changing weather or atmospheric conditions create a real or potential fire safety or air pollution problem, the Department may suspend or defer open burning until conditions change.

(5) Exceptions to the setback requirements shall be granted by the Department if the applicant obtains a signed statement from every affected resident within the setback area who waives his objections to the open burning associated with the land clearing operation. Statements must be received by the Department 48 hours in advance of the burning.

(6) Notwithstanding the provisions of Florida Administrative Code Rules 62-256.300(4)(a)2., 62-256.500(1)(a)2. and 62-256.500(l)(c), refractory-lined air curtain incinerators with forced underdraft air may commence burning at sunrise and may be charged until sunset, provided they maintain a setback distance of 1000 feet from occupied building located off site and do not create a nuisance. During such times as the air curtain incinerator is not in operation, public access to the air curtain incinerator shall be restricted.

Specific Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 1-11-82, Formerly 17-5.07, Amended 10-20-86,8-26-87,11-23-88, Formerly 17-5.070,17-256.500, Amended 11-30-94.

62-256.600 Industrial, Commercial, Municipal, and Research Open Burning.

(1) Open burning in connection with industrial, commercial, or municipal operations is prohibited, except when the open burning is determined by the Department to be the only feasible method of operation and prior approval is obtained from the Department, or when an emergency exists which requires immediate action to protect human health and safety, or in connection with county or municipal operations to burn hurricane, tornado, fire, or other disaster generated yard trash using an Air Curtain Incinerator as specified in Florida Administrative Code Rule 62-256.500(2).

(2) Open burning and the use of outdoor heating devices which are essential to a research project are allowed provided prior approval is obtained from the Department.

(3) The application for approval under this section shall include the following:

(a) The name, address, and telephone number of the person submitting the application;

(b) The type of business or activity involved;

(c) A description of the proposed equipment and operating practices, the type, quantity, composition and amount of air contaminants to be released to the atmosphere;

(d) The schedule of burning operations, if known;

(e) The exact location of requested open burning;

(f) If applicable, reasons why no method other than open burning is feasible; and

(g) Evidence that the proposed open burning has been approved by the fire control authority which has jurisdiction.

(4) Nothing herein shall relieve any person from complying with any other applicable laws, rules and ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

(5) The Department shall approve such operations or research projects only on specified conditions which protect the ambient air from pollutants and contaminants to the greatest extent, and may limit the approval to a specified time.

Specific Authority 403.061(7), (16) FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Formerly 17-5.08, Amended 10-20-86, 8-26-87, Formerly 17-5.080, 17-256.600.

62-256.700 Open Burning Allowed.

(1) Open burning to reduce yard trash and household paper products generated on occupied residential premises of not more than two family units is allowed in ozone attainment areas as specified in Florida Administrative Code Chapter 62-275 without Department authorization provided that all of the following conditions are met:

(a) The open burning does not produce smoke, soot, odors, visible emissions, heat, flame, radiation, or other conditions to such a degree as to create a nuisance.

(b) The open burning is one hundred (100) feet or more from any occupied building other than that owned or leased by the individual doing the burning and fifty (50) feet or more from any public highway or road and is ignited after 9:00 a.m. and is extinguished one hour before sunset providing that no visible smoke will be allowed over any adjacent residence or over the road that would cause a nuisance. These setback requirements apply in counties that are not specifically listed in 62-256.700(1)(c).

(c) The open burning is three hundred (300) feet or more from any occupied building other than that owned or leased by the individual doing the burning and one hundred (100) feet or more from any public highway or road and is ignited after 9:00 a.m. and is extinguished one hour before sunset providing that no visible smoke will be allowed over any adjacent residence or over the road that would cause a nuisance. The requirements in this section apply in the following counties: Dade, Broward, Pinellas, Hillsborough, Palm Beach, Duval, Orange, Polk, Brevard, Volusia, Escambia, Lee, Sarasota, Pasco, Seminole, Alachua, Manatee, Leon, Marion, Okaloosa, Lake, Bay, St. Lucie, and Collier.

(d) The open burning is fifty (50) feet or more from any residence on the property where the burning is being conducted.

(e) The open burning is attended and adequate fire extinguishing equipment is readily available at all times.

(f) The moisture content and composition of material to be burned shall be favorable to good burning which will minimize air pollution. Green or wet materials may be not be burned.

(g) The open burning is not prohibited by any local, county, municipal, or other governmental rule, regulation, law, or ordinance.

(h) The open burning is enclosed in a noncombustible container or ground excavation covered by a metal mesh or grill, and is setback at least 25 feet from any woodlands, forest, or brush.

(2) Open burning to reduce yard trash generated on occupied residential premises of not more than two family units in areas that are designated as non-attainment or maintenance areas for ozone as defined in Florida Administrative Code Rule 62-2 is allowed if a municipal, county or commercial solid waste collection service for yard trash is not available on a periodic basis of at least once a week. Prior authorization shall be obtained from the Department. The open burning must comply with all of the conditions contained in Florida Administrative Code Rule 62-256.700(1), and does not relieve any person from complying with any other applicable laws, rules and ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

(3) A camp fire, bonfire, or other fire will be allowed that is used solely for recreational purposes, for ceremonial occasions, for outdoor noncommercial preparation of food, or on cold days for warming of outdoor workers, as long as excessive visible emissions are not emitted.

(4) Open burning for the flaring of waste gases is allowed for reasons of safety, as long as excessive visible emissions are not emitted.

(5) Open burning is allowed for the instruction and training of organized fire fighters or industrial employees under the supervision of the appropriate public fire control official provided that:

(a) The burning activities are conducted by a full-time municipal fire control agency in accordance with the National Fire Protection Association document, "Live Fire Training Evolutions in Structures (NFPA 1403)," as revised February 10, 1992, and hereby adopted and incorporated by reference as the accepted practice for fire training instruction. Nothing herein shall be construed as relieving any person from complying with any other applicable laws, rules and ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

(b) The Division of Forestry, the Department, and local fire control officials are notified in advance of the time and place of the burning exercise.

(6) Subject to all of the following conditions, waste pesticide containers may be burned in open fields by the owner of the crops, the owner's authorized employee or caretaker, or by commercial pesticide applicators hired by the owner or caretaker.

(a) Plastic containers must be the original container provided by the pesticide manufacturer or formulator as end user conveyance for the specific product, and not reused containers designed for other products.

(b) Containers must be classified as Group I Containers and bear label instructions stating that small quantities of the containers may be burned in open fields by the user of the pesticide when such open burning is permitted by State and local regulations.

(c) The quantity of containers to be burned each day per parcel treated shall not exceed the amount accumulated during one day's use of pesticide. No more than 500 pounds of pesticide containers shall be burned per day at any specific location. If more than one fire is to be set in any area each specific burning location shall be at least 1,000 yards from each other location at which burning will occur concurrently.

(d) All Group I Containers which are to be disposed by open burning shall be completely empty and free of residual material pursuant to the following criteria:

1. Plastic containers including inner liners shall be triple rinsed with the same kind of solvent used to dilute the spray mixture in the field. The rinse liquids from the containers shall be added to the spray mixture in the field.

2. Paper containers shall be emptied by a final shaking and tapping of the sides and bottom to remove clinging particles. All loosened particles shall be added to the spray mixture or application in the field.

(e) The open burning shall meet the following conditions:

1. The open burning does not produce smoke, soot, odors, visible emissions, heat, flame, radiation, or other conditions to such a degree as to create a nuisance.

2. The open burning is two hundred feet or more away from any farm workers or occupied buildings and is one hundred feet or more away from any public road.

3. The fire is ignited after 9:00 A.M. and is extinguished one hour before sunset of the same day.

4. The person responsible for the burning is in attendance at an upwind location from the fire for the entire period of the bum (until all flame and smoke have dissipated).

5. The open burning is enclosed in a noncombustible container or ground excavation covered by a metal grill.

6. Nothing herein shall relieve any person from complying with any other applicable laws, rules and ordinances, including Chapter 590, Florida Statutes, and rules of the Division of Forestry.

Specific Authority 403.061 FS. Law Implemented 403.021, 403.031, 403.061 FS. History-New 7-1-71, Amended 1-11-82, 10-10-82, 7-30-85, Formerly 17-5.09, Amended 10-20-86, 8-26-87,11-23-88, Formerly 17-5.090, 17-256.700, Amended 11-30-94.

62-256.800 Effective Date.

This chapter, unless otherwise specified, shall become effective July 1, 1971.

Specific Authority 120.041(6) FS. Law Implemented 120.041(6) FS. History-New 7-1-71, Formerly 17-5.10,17-5.100, 17-256.800.