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Division of Air Resources Management

AES Cedar Bay, Inc.
Cedar Bay Cogeneration Project

B&V Project 18059
B&V File 32.0203
May 11, 1992

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Federal Express

AES Cedar Bay, Inc.
Post Office Box 26329
Jacksonville, Florida 32218-0329

Subject: Air Dispersion Modeling

Attention: Mr. Steve Wolf

Gentlemen:

Enclosed is a copy of the report entitled "Air Quality Impacts Resulting from Seminole Kraft Modifications". A copy of this report, the associated modeling runs on 3-1/2 inch diskettes, and a description of the modeling output nomenclature have been provided via Federal Express to the Florida Department of Environmental Regulations.

Very truly yours,

BLACK & VEATCH

Gary Y. Gunn

Gary Y. Gunn

alc
Enclosure

cc: Mr. Buck Oven, FDER w/enclosures

Air Quality Impacts Resulting From Seminole Kraft Modifications

May 1992

Introduction

Air dispersion modeling was performed to determine the net ambient air quality impacts resulting from the replacement of the proposed Seminole Kraft kraft recovery boiler (KRB) and smelt dissolving tank (SDT) with two steam generating boilers. The steam generating units would include either two 199 MBtu/hour package boilers firing residual oil or one oil-fired package boiler and one 174 MBtu/hour boiler firing fiber rejects. The net effects from the Seminole Kraft modifications and the net cumulative Jacksonville impacts were both assessed. The following sections describe the executive summary, scope of study, modeling methodology, and the modeling results.

Executive Summary

Modeling conducted during the licensing of the AES Cedar Bay (AES-CB) Cogeneration facility had shown rather large reductions in off-site impacts from the addition of the three coal fired CFB boilers and the shutdown of the five Seminole Kraft power boilers.

This additional modeling demonstrates that the identified additional modifications would cause additional improvements in air quality relative to the 3-hour and 24-hour SO_2 standard and annual NO_x standard. The annual SO_2 impacts showed an increase of 0.02 ug/m^3 for the two oil fired package boiler scenario and a decrease of 0.08 ug/m^3 for the oil/reject fired boiler scenario. A 0.02 ug/m^3 increase reflects two, 0.1, and 0.03 percent of the annual Prevention of Significant Deterioration (PSD) significant impact level, PSD Class II increment, and state ambient air quality standard, respectively.

The results of the net cumulative source modeling demonstrates that the Seminole Kraft modifications would cause no changes or actually cause a slight improvement in the overall SO_2 and NO_x concentrations in the Jacksonville area. Sources other than the Seminole Kraft facility were contributing to these maximum impact receptors.

Scope of Study

Applied Energy Services (AES) performed several air dispersion analyses in conjunction with air permitting for their AES-Cedar Bay (AES-CB) facility located in Jacksonville, Florida. These analyses considered predicted air quality impacts from the AES-CB facility and also proposed changes in the existing Seminole Kraft facility located adjacent to the AES-CB facility site. These analyses included modeling performed for the Site Certification Application (SCA) and an August 1990 study to determine Jacksonville ambient air quality concentrations.

As shown in the previous studies, at least six major pollutants will be potentially emitted from the proposed AES-CB facility at levels above the PSD significant emission rates. If the credits for the shutdown of existing Seminole Kraft (SK) sources are ignored, then these pollutants would be subject to further PSD review. These pollutants are CO, Pb, PM, SO_2, and NO_x. As done in previous studies, only those pollutants where the AES-CB facility had significant air quality impacts were modeled further.

It was demonstrated in the SCA that the AES-CB facility would not have a significant impact area for CO. Also, it was shown that conservative 24-hour Pb impacts fell below the Pb quarterly air quality standards. The fugitive dust and stack particulate emissions from the AES-CB facility were previously modeled to determine the extent of the significant impact area and demonstrate standards compliance. This modeling demonstrated that the AES-CB facility would have predicted impacts less than significance at all offsite receptors.

Modeling for the August 1990 study demonstrated that SO_2 and NO_x had significant impact areas extending to 26.5 kilometers and 0.8 kilometers, respectively. Therefore, these pollutants were modeled in this analysis to determine the net changes in air quality impacts. In addition, the net impacts from the Seminole Kraft modifications were examined for CO, PM, and VOCs.

Modeling Methodology

The purpose of the modeling was to demonstrate that the net changes in the Seminole Kraft facility would not contribute to increases in ambient air quality impacts. Initially, the proposed Seminole Kraft sources to be shut down (i.e., KRB, SDT--"before" case) and the proposed Seminole Kraft sources (i.e., 2 steam boilers--"after" case) were modeled as separate source groups. The overall maximum SO_2 and NO_x impacts from the two source groups were compared to determine the net air quality impacts resulting in the proposed facility changes at the Seminole Kraft facility. For both the SO_2 and NO_x analyses the "after" case consisting of the two oil-fired package boilers had worst-case impacts compared to the "after" case consisting of one oil-fired and one fiber reject boiler.

The two proposed ("after") steam boilers will have combined flue gas exhaust streams. Therefore, the net impacts in the Seminole Kraft facility also examined the possible scenario where one steam boiler would not be operating. The emissions in such a situation would be lower, but the lower emissions would be partially offset by poorer dispersion resulting from the lower flow volume.

In addition, the existing major Jacksonville sources were added to determine the net cumulative source impacts. This was done to ensure that the facility changes would not result in an increase in the maximum cumulative impacts for SO_2 and NO_x.

Air Dispersion Model/Meteorological Data

Following the recommended EPA modeling guidance for refined models, the Industrial Source Complex Short-Term (ISCST) dispersion model was used to determine pollutant impacts. The same five year meteorological data set (1981-1985) used for previous project modeling (i.e., Jacksonville surface and Waycrosse, GA upper air) was used for this analysis.

Model Options and Assumptions

ISCST's building downwash model option was used as appropriate to consider the effects of nearby buildings for both the existing and proposed sources. Specifically, JEA Northside, Seminole Kraft, and the AES-CB limestone dryer vents were modeled with building downwash parameters. For downwash modeling, the building dimensions were conservatively based on the maximum projected width regardless of wind direction. This is consistent with previous AES-CB studies. The following include additional options that were included in this assessment.

- o The proposed modeling site was considered rural for modeling purposes based on the land use within a 3-kilometer radius.
- o No terrain effects were included since the surrounding area is nearly flat.
- o The concentrations for each receptor were represented by the second-highest concentration predicted from the five year of meteorological data for the short-term impacts. Annual impacts were represented by the highest concentrations.

Receptor Grid

A polar receptor grid was used for this analysis with the center of the receptor grid placed at the proposed Seminole Kraft source stack. This location is designated by the UTM coordinates (442.0 km East, 3365.6 km North). The receptors were placed in 10 degree radials along rings placed with the following density:

- 100-meter increments: 100 meters to 1,500 meters,
- 250-meter increments: 1,500 meters to 2,500 meters,
- 500-meter increments: 2,500 meters to 5,000 meters,
- 1,000-meter increments: 5,000 meters to 15,000 meters, and
- 5,000-meter increments: 15,000 meters to 25,000 meters.

Emissions Data

The emissions data, stack parameters, and the associated assumptions for the Seminole Kraft sources are given in Table 1. The SO_2 and NO_x emission inventories for Jacksonville sources used in the August 1990 study are given in Table 2 and 3, respectively. The Jacksonville emissions inventories are identical to those used in the August 1990 study with the exception of the following changes in Seminole Kraft sources associated with this study.

- The power and bark boilers were eliminated from the inventory due to their proposed shutdown.
- The KRB and SDT were assigned parameters as given in Table 1.
- The AES-CB facility sources were also included.

Modeling Results

The modeling results for the SO_2 and NO_x analyses are given in the following sections. The net impacts from the Seminole Kraft changes and the net cumulative impacts are discussed separately.

SO2 Modeling Analyses

The results of the net Seminole Kraft modeling are shown in Table 4. The three "after" scenarios shown in the table reflect possible operating configurations for the new steam boilers. As shown in the table, the 3-hour and 24-hour SO_2 concentrations are lower for each of the "after" scenarios. Because the reject

Table 1

Modeling Parameters Associated with the Seminole Kraft Changes

Model Parameters	"Before" KRB	"Before" SDT	"After" 2 Pkg Blr	"After" 1 pkg/rej blr
UTM East km	441.94 (a)	441.97 (a)	442.0 (b)	442.0 (b)
UTM North km	3365.49 (a)	3365.52 (a)	3365.6 (b)	3365.6 (b)
Building Ht. m	49.07 (c)	64.008 (a)	49.07 (c)	49.07 (c)
Max. Proj. Width m	85.344 (a)	45.72 (a)	85.344 (a)	85.344 (a)
GEP Stack Height m	122.68	132.588	122.68	122.68
Stack Height m	122.68	73.2	122.68	122.68
Stack Exit Diameter m	3.4 (a)	1.5 (a)	3.81 (d)	3.81 (d)
Stack Velocity m/s	20.4 (a)	14.2 (a)	15.58 (d)	15.58 (d)
Stack Temperature K	478 (a)	344 (a)	352.6 (d)	352.6 (d)
Emissions Data				
SO2 g/s	64.8 (e)	0.29 (e)	26.08 (f)	13.04 (f)
NO_x g/s	46.59 (e)	-- (e)	15.04 (f)	11.89 (f)

(a) From SCA-Amendment 5. Exact source coordinates instead of facility coordinates used. Building heights and maximum projected width were based on the controlling building for GEP calculations.

(b) From KBN Engineering air permit application for proposed Seminole Kraft modifications.

(c) Taken from recent AES-CB plant arrangement drawing number 15638-1BSA-M1109-Rev 0.

(d) Per telephone conversation with KBN Engineering--based on (b). Based on a combined flue stream for the two steam boilers.

(e) Based on the KBN Engineering air permit application for the SDT and KRB. KRB annual SO_2 emission rates is 42.75 g/s.

(f) Based on AES information about boiler size and emission factors.

Table 2

DUVAL COUNTY EXISTING AND PERMITTED SO2 SOURCES

Source	UTM Coordinates East km	UTM Coordinates North km	Stack Parameters Height m	Stack Parameters Diam. m	Exit Gas Parameters Temp. K	Exit Gas Parameters Velocity m/s	Maximum SO2 Emissions g/s
JEA ST. JOHNS RIVER POWER PARK*							
UNITS 1,2	446.9	3366.3	195.1	6.79	342	27.4	1176.6
JEA NORTHSIDE*							
UNIT 1	446.94	3364.995	76.2	5.03	403	23.1	690.2
UNIT 2	446.870	3364.960	88.4	5.03	394	13.1	586.8
UNIT 3	446.820	3364.975	106.7	7.01	418	21.7	1255.6
C TURBINES 3-6	446.760	3365.452	13.7	5.84	714	8.8	232.0
JEA SOUTHSIDE*							
UNIT 3	437.678	3353.933	40.7	3.05	424	13.4	79.8
UNIT 4	437.670	3353.962	43.7	3.25	408	18.5	110.3
UNIT 5	437.682	3353.845	44.2	2.96	415	21.3	207.9
JEA KENNEDY*							
UNITS 8,9	440.068	3359.140	45.7	3.20	409	10.7	150.0
UNIT 10	440.085	3359.095	41.5	2.74	427	24.3	185.0
C TURBINES 3-6	439.844	3359.180	13.7	5.84	714	8.8	191.2
CONTAINER CORP OF AMERICA							
REC BOILER 4	4585.1	3386.70	80.8	3.51	493	18.84	222.9
REC BOILER 5	4585.1	3386.70	88.1	5.49	493	9.48	222.9
POWER BOILER 4	4585.1	3386.70	75.6	2.44	485	14.41	128.8
POWER BOILER 5	4585.1	3386.70	75.6	3.35	480	16.20	273.5
POWER BOILER 7	4585.1	3386.70	103.6	4.51	441	12.90	154.4
CELOTEX							
020207	446.4	3362.5	22.9	0.91	728	5.03	6.85
020208	446.4	3362.5	15.2	0.94	436	7.57	15.71
U.S. NAVAL STATION							
21302	460.4	3362.8	12.2	0.91	544	14.38	41.42
21304	460.4	3362.8	14.0	1.22	561	8.09	24.48
ANCHOR HOCKING							
000503	431.5	3357.5	33.2	1.71	541	7.87	10.36
000504	431.5	3357.5	35.7	1.58	469	9.40	8.83
ANHEISER BUSCH							
000603	437.9	3366.8	30.5	1.07	483	17.49	15.25
000605	437.9	3366.8	21.3	1.68	322	9.88	8.69

DUVAL COUNTY EXISTING AND PERMITTED SO2 SOURCES

Source	UTM Coordinates East km	UTM Coordinates North km	Stack Parameters Height m	Stack Parameters Diam. m	Exit Gas Parameters Temp. K	Exit Gas Parameters Velocity m/s	Maximum SO2 Emissions* g/s
SCM CORP.							
003904	435.6	3360.7	12.2	1.10	405	14.25	19.91
003905	435.6	3360.7	15.2	1.10	536	12.93	20.94
003906	435.6	3360.7	15.2	1.22	514	10.45	24.45
WILEY JACKSON							
004201	428.7	3361.4	11.6	0.98	376	31.34	13.26
JAX BULK TERM							
014805	439.3	3359.8	18.3	0.91	427	10.14	3.85
JEFFERSON SMURFITT							
POWER BOILER 10	439.9	3359.3	61.0	3.05	341	9.70	66.62
REC. BOILER 9	439.9	3359.3	53.3	3.20	410	12.15	23.98
SEMINOLE KRAFT							
RECOVERY BOILERS**	441.8	3365.5	129.5	3.4	478	20.4	64.8
SMELT TANK**	441.8	3365.5	73.2	1.5	344	14.2	0.29
POWER BOILERS***	441.8	3365.5	32.3	1.83	433	20.12	200.0
BARK BOILER 1&2***	441.8	3365.5	41.5	2.44	329	13.72	114.0

*Based on JEA data.

**Based on Seminole Kraft PSD Permit Application for Kraft Recovery Boilers and Smelt Dissolving Tanks (August 1989).

***Based on FDER data; confirmed by AES calculations.7

Table 3
EXISTING NOX SOURCES.

Source	UTM Coordinates East	UTM Coordinates North	Stack Parameters Height	Stack Parameters Diam.	Exit Gas Parameters Temp.	Exit Gas Parameters Velocity	Maximum NOx Emissions
	km	km	m	m	K	m/s	g/s
SEMINOLE KRAFT							
RECOVERY BOILERS*	441.8	3365.5	129.5	3.4	478	20.4	46.59
SMELT TANK*	441.8	3365.5	73.2	1.5	344	14.2	--
POWER BOILER 1**	441.8	3365.5	32.3	1.83	433	20.12	23.2 total
POWER BOILER 2**	441.8	3365.5	32.3	2.13	450	21.34	all boilers
POWER BOILER 3**	441.8	3365.5	32.3	2.13	450	22.86	
BARK BOILER 1&2**	441.8	3365.5	41.5	2.44	329	13.72	11.3
U.S. GYPSUM							
NO.2 BOARD KILN	438.9	3361.2	11.2	1.1	490	29.05	1.02
NO.1-6 KETTLES	438.9	3361.2	32.0	1.1	536	0.98	0.71
NO. 2 WALLBRD HEATER	438.9	3361.2	20.7	0.9	613	6.61	0.30
ROTARY ROCK DRYER	438.9	3361.2	24.8	0.9	450	16.82	0.33
NO. 7 KETTLE	438.9	3361.2	30.7	0.7	521	3.05	0.50
NO. 1-4 BOILERS	438.9	3361.2	18.6	0.9	551	3.35	1.66

*Based on Seminole Kraft PSD Permit Application for Kraft Recovery Boilers and Smelt Dissolving Tanks (August 1989).

**Based on 1983-1984 Seminole Kraft emissions data.

Table 4
Comparison of Proposed & Modified Seminole Kraft Source SO_2 Impacts

3-Hour Highest, Second-Highest SO_2 Impacts (ug/m^3)

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	20.3	14.2	10.5	7.1
1982	23.0	16.9	12.5	8.5
1983	15.6	12.3	9.8	6.2
1984	20.6	15.3	11.1	7.7
1985	21.7	15.1	11.2	7.6

24-Hour Highest, Second-Highest SO_2 Impacts (ug/m^3)

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	4.25	3.31	2.47	1.66
1982	4.21	3.04	2.24	1.52
1983	3.82	2.76	2.02	1.38
1984	4.59	3.31	2.47	1.66
1985	4.64	3.60	2.70	1.80

Annual Highest SO_2 Impacts (ug/m^3)

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	0.18	0.19	0.14	0.10
1982	0.21	0.23	0.17	0.11
1983	0.17	0.18	0.13	0.09
1984	0.19	0.21	0.15	0.10
1985	0.17	0.18	0.14	0.09

fired boiler does not have any SO_2 emissions, the "after" scenario consisting of one oil-fired and one reject-fired boiler demonstrated the greatest air quality improvement. The two oil-fired boiler, one oil-fired boiler, and one oil-fired/one reject-fired boiler scenarios showed a 21, 37, and 60 percent improvement in short-term air quality impacts, respectively. The annual modeling showed a slight increase in the "after" concentrations for the two oil-fired boiler scenario. The increases, however, were less than 0.03 ug/m^3. For the other "after" scenarios, the modeling demonstrated a net air quality improvement.

The cumulative SO_2 modeling demonstrated no change or slight improvements in air quality impacts. These results are shown in Table 5. The results demonstrate that sources other than the Seminole Kraft facility are contributing to the maximum impacts. Therefore, the Seminole Kraft modifications would not significantly decrease the impacts at these receptors.

NOx Modeling Analyses

The results of the net Seminole Kraft modeling for NO_x are shown in Table 6. The results demonstrate that all "after" scenarios show at least a 40 percent improvement in NO_x annual impacts.

The cumulative impact modeling are also shown in Table 6. The results show that the Seminole Kraft modifications have small or no contributions on maximum cumulative impact receptors. For all "after" scenarios, the cumulative impacts were equal to or less than the "before" impacts.

CO Modeling Results

The results of the CO modeling are shown in Table 7. The scenario of operating just one reject boiler was also considered because the reject boiler had higher CO emissions that the package boiler. The results of the net modeling of the Seminole Kraft modifications demonstrates that significant improvements in CO impacts. Both the 1-hour and 8-hour CO impacts showed improvements of at least 50 percent even for the worst-case "after" boiler configuration.

PM Modeling Results

The results of the PM modeling are shown in Table 8. The results of the modeling demonstrate that the maximum "after" impacts will also be less than the "before" impacts independent of the "after" boiler configurations.

Table 5
Comparison of Combined Source SO_2 Pollutant Impacts
with AES-CB/Seminole Kraft Proposed & Modified Sources

3-Hour Highest, Second-Highest SO_2 Impacts (ug/m^3)

Year	Proposed Combined (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	555.4	555.1	554.9	555.0
1982	671.4	671.4	671.4	671.4
1983	592.9	592.9	592.9	592.9
1984	516.2	516.2	516.2	516.2
1985	544.8	544.8	544.8	544.8

24-Hour Highest, Second-Highest SO_2 Impacts (ug/m^3)

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	233.2	232.8	232.4	232.6
1982	244.3	244.3	244.3	244.3
1983	300.1	299.9	299.7	299.8
1984	185.4	185.1	184.7	184.9
1985	210.5	210.4	210.3	210.4

Annual Highest SO_2 Impacts (ug/m^3)

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	32.62	32.56	32.44	32.50
1982	35.88	35.79	35.63	35.71
1983	35.17	35.10	34.97	35.03
1984	33.28	33.21	33.09	33.15
1985	35.04	34.98	34.85	34.91

Table 6
Comparison of NO_2 Pollutant Impacts with Combined Source Impacts and with Seminole Kraft Proposed & Modified Sources

Annual Highest NO_2 Impacts (ug/m^3)
For Proposed/Modified Seminole Kraft Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	0.18	0.11	0.09	0.09
1982	0.22	0.13	0.10	0.10
1983	0.18	0.10	0.10	0.08
1984	0.20	0.12	0.09	0.09
1985	0.18	0.11	0.08	0.08

Annual Highest NO_2 Impacts (ug/m^3)
For Combined Sources

Year	Proposed Combined (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boiler (after 2)	Modified 1-Pkg Boiler & 1-Reject Boiler (after 3)
1981	4.79	4.79	4.79	4.79
1982	4.99	4.99	4.99	4.99
1983	4.91	4.91	4.91	4.91
1984	4.48	4.48	4.48	4.48
1985	4.81	4.81	4.81	4.81

Table 7
1 Hour Highest CO Impacts (ug/m^3)
With Seminole Kraft Proposed & Modified Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boilers (after 2)	Modified Pkg/Reject Boilers (after 3)	Modified Reject Boiler (after 4)
1981	42.1	2.15	1.68	12.2	17.4
1982	42.4	2.17	1.66	12.3	17.2
1983	42.1	2.25	1.68	12.8	17.4
1984	42.8	2.12	1.65	12.1	17.1
1985	42.5	2.12	1.66	12.1	17.1

8 Hour Highest CO Impacts (ug/m^3)
With Seminole Kraft Proposed & Modified Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boilers (after 2)	Modified Pkg/Reject Boilers (after 3)	Modified Reject Boiler (after 4)
1981	10.2	0.55	0.41	3.15	4.24
1982	8.94	0.50	0.37	2.83	3.83
1983	8.21	0.53	0.40	2.99	4.15
1984	10.1	0.48	0.36	2.74	3.73
1985	11.1	0.52	0.40	2.98	4.16

Table 8
Annual PM Impacts (ug/m^3)
With Seminole Kraft Proposed & Modified Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boilers (after 2)	Modified Pkg/Reject Boilers (after 3)
1981	0.71	0.04	0.03	0.04
1982	0.81	0.04	0.03	0.04
1983	0.65	0.04	0.03	0.03
1984	0.62	0.04	0.03	0.04
1985	0.60	0.04	0.03	0.03

24 Hour Highest PM Impacts (ug/m^3)
With Seminole Kraft Proposed & Modified Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boilers (after 2)	Modified Pkg/Reject Boilers (after 3)
1981	5.47	0.64	0.47	0.60
1982	5.93	0.58	0.43	0.55
1983	6.32	0.53	0.39	0.50
1984	6.49	0.64	0.47	0.60
1985	5.78	0.69	0.52	0.65

VOC Modeling Results

The results of the VOC modeling are shown in Table 9. The fiber reject boiler had higher VOC emissions than the package boiler. Therefore, the reject boiler alone was also modeled. The results of the modeling demonstrate that the 1-hour VOC "after" concentrations will be less than the "before" concentrations for all boiler configurations. Even for the "after" scenario where only the fiber reject boiler is operating, the VOC impacts show a 10 percent improvement in air quality.

Table 9
1 Hour Highest VOC Impacts (ug/m^3)
For Combined Sources

Year	Proposed KRB/SDT (before)	Modified 2-Pkg Boilers (after 1)	Modified 1-Pkg Boilers (after 2)	Modified Pkg/Reject Boilers (after 3)	Modified Reject Boiler (after 4)
1981	4.81	0.32	0.25	2.94	4.35
1982	4.85	0.32	0.25	2.97	4.30
1983	4.82	0.33	0.25	3.07	4.35
1984	4.89	0.32	0.24	2.91	4.27
1985	4.86	0.31	0.25	2.90	4.28

List of Modeling Runs

Archive	Run	Year	Pollutant	Sources
SO_2 NET	NET31 NET41	1981	SO_2	Seminole Kraft "before" and "after"
	NET32 NET42	1982	SO_2	Seminole Kraft "before" and "after"
	NET33 NET43	1983	SO_2	Seminole Kraft "before" and "after"
	NET34 NET44	1984	SO_2	Seminole Kraft "before" and "after"
	NET35 NET45	1985	SO_2	Seminole Kraft "before" and "after"

Note: NET 3 refers to 2 boiler "after" case, and NET4 refers to 1 boiler "after" case.

SO_2CUM	NET51	1981	SO_2	Cumulative Jacksonville Sources
	NET52	1982	SO_2	Cumulative Jacksonville Sources
	NET53	1983	SO_2	Cumulative Jacksonville Sources
	NET54	1984	SO_2	Cumulative Jacksonville Sources
	NET55	1985	SO_2	Cumulative Jacksonville Sources
NO_xNET	NETNO_x11	1981	NO_x	Seminole Kraft "before" and "after"

Archive	Run	Year	Pollutant	Sources
	$NETNO_x12$	1982	NO_x	Seminole Kraft "before" and "after"
	$NETNO_x13$	1983	NO_x	Seminole Kraft "before" and "after"
	$NETNO_x14$	1984	NO_x	Seminole Kraft "before" and "after"
	$NETNO_x15$	1985	NO_x	Seminole Kraft "before" and "after"
NO_xCUM	$NETNO_x21$	1981	NO_x	Cumulative Jacksonville Sources
	$NETNO_x22$	1982	NO_x	Cumulative Jacksonville Sources
	$NETNO_x23$	1983	NO_x	Cumulative Jacksonville Sources
	$NETNO_x24$	1984	NO_x	Cumulative Jacksonville Sources
	$NETNO_x25$	1985	NO_x	Cumulative Jacksonville Sources
OTHVOC	OTHV1	1981	VOC	Seminole Kraft "before" and "after"
	OTHV2	1982	VOC	Seminole Kraft "before" and "after"
	OTHV3	1983	VOC	Seminole Kraft "before" and "after"
	OTHV4	1984	VOC	Seminole Kraft "before" and "after"

Archive	Run	Year	Pollutant	Sources
	OTHV5	1985	VOC	Seminole Kraft "before" and "after"
OTHCO	OTHC1	1981	CO	Seminole Kraft "before" and "after"
	OTHC2	1982	CO	Seminole Kraft "before" and "after"
	OTHC3	1983	CO	Seminole Kraft "before" and "after"
	OTHC4	1984	CO	Seminole Kraft "before" and "after"
	OTHC5	1985	CO	Seminole Kraft "before" and "after"
OTHPM	OTHP1	1981	PM	Seminole Kraft "before" and "after"
	OTHP2	1982	PM	Seminole Kraft "before" and "after"
	OTHP3	1983	PM	Seminole Kraft "before" and "after"
	OTHP4	1984	PM	Seminole Kraft "before" and "after"
	OTHP5	1985	PM	Seminole Kraft "before" and "after"