_			
PS Form 3811, July 1983	SENDER: Complete items 1, 2, 3 and 4.  Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.  1. Show to whom, date and address of delivery.  2. Restricted Delivery.		
		·	
	3. Article Addressed to: Mr. Jerry E. Wo Duval County BE 515 West 6th St Jacksonville, F	s reet	
	4. Type of Service:	Article Number	
	Registered Insured Certified COD Express Mail		
	Always obtain signature of ad DATE DELIVERED.	idressee <u>or</u> agent and	
	- 0:		
DOM	S. Signature - Addressee	Varanto	
ESTIC	6. Signature – Afgent	2001	
DOMESTIC RETURN	7. Date of Delivery	61 E	
RN RECEIF	8. Addressee's Address (ONL)	Y (requested and fee baid)	

# P 408 530 282

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

•,		(See Reverse)	
Sent to		Woosley,	BES
Street	N bna	o	
P.O., S	itate o	nd ZIP Code	
Postag	0	· · · · · · · · · · · · · · · · · · ·	\$ .
Cortifi	ed Fe	9	
Specia	i Deli	very Fee	
Restri	cted D	elivery Fee	
to wh	om an	oipt Showing d Date Delivered	
Data .		ot Showing to whom, dress of Delivery	
TOTA	L Pos	tage and Fees	\$
TOTAl Postm	ark or	Date	
틴	7	/18/85	,

		•
2	SENDER: Complete items 1, 2, and 3.  Add your address in the "RETURN TO" space on reverse.	,
381	1. The following service is requested (check one.)	
Ξl	To Chart to whom and date delivered	
	Show to whom, date and address of delivery •	
3	RESTRICTED DELIVERY	1
2	Show to whom and date delivered	
١	RESTRICTED DELIVERY.	1
١	Show to whom, date, and address of delivery.\$	
	(CONSULT POSTMASTER FOR FEES)	1
	2. ARTICLE ADDRESSED TO:	1
곮	Mr. Bill Johnson	
2	Barnett Regency Tower, Stel	200
2	Barnett Regency 10.027	1
æ	Jacksonville, FL 32211 3. ARTICLE DESCRIPTION:	i
C	REGISTERED NO.   CERTIFIED NO.   INSURED NO.	
亨		1
27	0156544	
6	(Always obtain signature of addressee or agent)	-1
5	Thave received the article described above.	1
7	SIGNATURE DAddressee DAuthorized agent	1
ç		1
2	K Salley S	1
č	DATE OF DELIVERY	1
6		1 .
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ŧ	5. ADDRESS (Complete only if requested)	·
ç		.1
		_
RETURN RECEIPT, REGISTERED, MOUNED AND CERTIFICATION	6. UNABLE TO DELIVER BECAUSE: CLERKS	· T:
i		
	<b>≸</b>	~
i	₹7GPO : 1979-300-4	159

0156544  $\mathbb{N}_{\mathbb{O}}$ .

#### RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL (See Reverse)

	STI		ANE	Bill Johns O NO.	on
} 1	PO	STAC	ìΕ		\$
		CEF	RTIFI	ED FEE	¢
	SE	ŗ	SPE	CIAL DELIVERY	¢
	<u> </u>		RES	TRICTED DELIVERY	¢
	CONSULT POSTMASTER FOR FEES	SERVICES	SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
	OSTIMA			SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
	SULT P	OPTIONAL	TURN RECEIPT	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED OELIVERY	¢
	NOO		RETUR	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
1976	TO	TAL	POST	TAGE AND FEES	\$
PS Form 3800, Apr. 1976	POS	STM	ARK	8/14/84	

PS Form 3811, Jan. 1979	SENDER: Gomplete items 1, 2, and 3. Add your address in the "RE reverse.  1. The following service is requested (check Show to whom and date delivered Show to whom, date and address RESTRICTED DELIVERY Show to whom and date delivered RESTRICTED DELIVERY.  Show to whom, date, and address the service of the	eck one.) d¢ of delivery¢
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RECEIPT, REGISTENED, INSURED AND CERTIFIED	(Always obtain signature of addre  I have received the article: described about SIGNATURE DAddressee DAuthoriz  A. DATE OF DELIVERY  5. ADDRESS (Complete enty if requested)	ove.
IED MAIL	6. UNABLE TO DELIVER BECAUSE:	CLERK'S INITIALS

# P 408 530 362

#### RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

	(Dee Keverse)		
	Sont to Ridge ( Stroot and No. Resorting Sq.	Shappin	5 Gu
	P.O., State and ZIP Code  COCKSO UNLLE F	32211	3
	Postage	\$	
	Cortified Fee		
٠	Special Delivery Fee		
	Restricted Delivery Fee		
	Return Receipt Showing to whom and Date Delivered		
22	Return Receipt Showing to whom, Date, and Address of Delivery	<u>,</u>	
3 19	TOTAL Postage and Fees	\$	
), Fel	Postmark or Date		
380		•	
PS Form 3800, Feb. 1982		,	
S			

3800 Feb 1982

SENDER: Complete items 1, 2, and 3. Add your address in the "RETT reverse.	URN TO" space on
Add your address in the "RETT reverse.  1. The following service is requested (check in the interest in the interest.)  Show to whom and date delivered.  RESTRICTED DELIVERY  Show to whom and date delivered.  RESTRICTED DELIVERY.  Show to whom, date, and address of the interest in the interest.	f-delivery
(CONSULT POSTMASTER FOR I	
2. ARTICLE ADDRESSED TO:	
Dr. John B. Koogler 1213 N.W. 6th Stree Gainesville, FL 326 3 ARTICLE DESCRIPTION: REGISTERED NO.   CERTIFIED NO.	
	INSURED NO.
(Always obtain signature of address	38-OL 03-10-98
Always obtain signature of address  I have received the article described above SIGNATURE DAddressee BAUthorize  DATE OF DELIVERY  JUZENS  5. ABDRESS (Complete only if requested)	NOV SEMONE I
6. UNABLE TO DELIVER BECAUSE:	CLERK'S INITIALS

# P 408 530 371 RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

Dr. John B. Kood	ler
Street and No.	
P.O., State and ZIP Code	
Postage	\$ .
Cortified Fee	·
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered.	
Return Receipt Showing to whom, Date, and Address of Delivery	· 
TOTAL Postago and Fees	\$
Postmark or Date	
TOTAL Postago and Fees Postmark or Date  11/22/83	
Form	
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SENDER	Complete items 1, 2, and 3. Add your address in the "RET reverse.	TURN TO" space on
1. The following should be	owing service is requested (che ow to whom and date delivered ow-to whom, date and address STRICTED DELIVERY ow to whom and date delivered STRICTED DELIVERY. ow to whom, date, and address	i
-} (cc	NSULT POSTMASTER FOR	FEES)
2 ARTIC	LE ADDRESSED TO:	
9501 Z Jackso	obert C. Gillan Arlington Expre Onville, FL 32:	essway
- 1	LE DESCRIPTION: LED NO.   CERTIFIED NO.   P408530330	INSURED NO.
6 (Alwa	vs obtain signature of addres	ssea.or.agant)
179	eived the article described aborate  Background Showing Showin	
DATE	OF DELIVERY /5	POSTMARK
S. ADDR	ESS (Complete only if requested)	- 1/2 -
B. UNAS	E TO DELIVER BECAUSE:	CLERK'S INITIALS
-		☆GPO :: 1979-300-455

P 408 530 330

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—

NOT FOR INTERNATIONAL MAIL

(See Reverse)

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S	ent to Robert C. Gillan	der, J	r
S	501 Arlington E	xpress	W
1	P.O., State and ZIP Code Tacksonville, FI	3221	-
Г	Postage	\$	
1	Certified Fee	<u>.</u>	
Ţ	Special Delivery Fee		
1	Restricted Delivery Fee		
Ì	Return Receipt Showing to whom and Date Delivered		
۰, ا	Return Receipt Showing to whom,	· ·	
. 1982	TOTAL Postage and Fees	\$	
, Feb	Postmark or Date		
PS Form 3300, Feb., 1982	7/21/83		
Forn			
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## Best Available Copy

Tue Jun 14 13:02

4 D P F O D I

ID: REGENCY STATIRGED CLASS: 150 ACCT: PHOJE: 904/725-9272 SORT: DOTICEOFPR AD: 0066361 NATREGENCY SQUARE PROPERTIE AD1:PO BOX 2718 AD2: ATTN: BOB GILLANDER CITY: Jacksonville ST:FL 21P:32232-0033 PU#ZKEY: 15. STYLE: classaul PL.BY:Sue CHGCRD: # TERR: C 1300 TAKER: (3300 RUH: T.IS: 6/15 10 rate: 141-40 / • 0.00 RATECO: PRAM LNRATE: 2.02 Lines: 141.40 XCHGCD: /: 0.00 LINES: 70 InChels: 5.0 START: 96/15/83T END: 96/15/83J EDN: TJS PAID: T1MES:000 /: 1

NUTLEE OF (ge)

CXI>PROPOSED AGENCY ACTION (UC)

NOTE:send proof of running

(ac)

The Department of Environmen(m-)

tal Regulation gives notice of its

intent to issue a permit to Regen(m-)

cv Square Properties for the

construction/installation of a

worthington reciprocating en(m-)

oine and generator set (No. 5) at

their existing tacility in Jackson(m=)

ville, Duval County, Florida, The

tacility is also being modified by

increasing hours of operation

and acoutring the capability to

tire 100% diesel oil as a back-up

fuel in case of a natural gas

shortage. A determination of

Best Available Control Technol (m-)

ody (BACT) was not required.(en)

(ac)

A person who is substantially af(m+)

#### 150 PUBLIC NOTICES

PROPOSED AGENCY ACTION

The Department of Environmental Regulation gives notice of its intent to issue a permit to Resency Square Properties for the Canstruction/installation of a Worthington reciprocating engine and generator set (No. 5) at their existing facility in Jackson-ville, Duoi Country, Florida. The facility is also being modified by increasing hours of operation and acquiring the capability to fire 100% diesel oil as a back-up fuel in case of a natural gas shortage. A determination of Best Available Control Technology (BACT) was not required.

opy (BACT) was not required.

A person who is substantially affected by the Department's proposed permitting decision may request a hearing in accordance with Section 120.57, Florida Statutes, and Chapters 17-1 & 28-5, Florida Administrative Code. The request for hearing must be filed (received) in the Office of General Counsel of the Department of 2000 Blair Stone Road. Twin Towers Office Building, Tallahassee Florida 32301 within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may hove to request a hearing under Section 120.57, Florida Statutes.

The application, technical evaluation and department intent are available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the following locations:

DER Bureau Of Air Quality Management 2600 Blair Stone Road Taliahassee, Florida 32301

DER Northeast District 3426 Bills Road Jacksonville, Florida 32207

Duval County Division of Bio-Environmental Services 515 West 6th Street Jacksonville, Florida 32206

Comments on this action shall be submitted in writing to Bill Thomas of Tallahassee office within thirty (30) days of this notice. JUN 1 6 1982

3Y\_

S Ferm	SENDER: Complete items 1, 2, and 3.  Add your eddress in the "RETURN TO" space on reverse.
3941, Jan. 1979	1. The following service is requested (check one.)  Show to whom and date delivered
	RESTRICTED DELIVERY.  Show to whom, date, and address of delivery.\$  (CONSULT POSTMASTER FOR FEES)
,	
-	2. ARTICLE ADDRESSED TO:
Ē	Mr. Robert C. Gillander, Jr.
S	9501 Arlington Expressway
Z	Jacksonville, FL 32211
ECEIP	3. ARTICLE DESCRIPTION: REGISTERED NO.   CERTIFIED NO.   INSURED NO.
긘	1 1,000,000
20	<b>⊉</b> 408530323
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REGISTERS	(Always obtain signature of addressee or agent)
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RETURN RECEIPT, REGISTERED, INSURED AN	(Always obtain signature of addressee or agent)  Thave received the article described above.  SIGNATURE DAddressee DAuthorized agent  A. DATE OF DELIVERY
AND	(Ahways obtain signature of addressee or agent)  Thave received the article described above.  SIGNATURE DAddressee DAuthorized agent  Shum E. King
AND	(Always obtain signature of addressee or agent)  Thave received the article described above.  SIGNATURE DAddressee DAuthorized agent  A. DATE OF DELIVERY
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AND CERT	(Always obtain signature of addressee or agent)  Fhave received the article-described above.  SIGNATURE DAddressee DAuthorized agent  4. DATE OF DELIVERY  5. ADDRESS (Complete only if reduced)  6. UNABLE TO DELIVER BECAUSE:  DATE OF DELIVER BECAUSE:
AND	(Always obtain signature of addressee or agent)  Thave received the article described above.  SIGNATURE DAddressee DAuthorized agent  DATE OF DELIVERY  DATE OF DELIVERY  5. ADDRESS (Complete only if received)
AND CERT	(Always obtain signature of addressee or agent)  Fhave received the article-described above.  SIGNATURE DAddressee DAuthorized agent  4. DATE OF DELIVERY  5. ADDRESS (Complete only if reduced)  6. UNABLE TO DELIVER BECAUSE:  DATE OF DELIVER BECAUSE:

408 530 323

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)				
Sent to Robert C. Gillar	nder			
Street and No.				
P.O., State and ZIP Code				
Postage	\$			
Cortified Fee.				
Special Delivery Fee				
Restricted Delivery Fee				
Return Receipt Showing to whom and Date Delivered				
Return Receipt Showing to whom, Date, and Address of Delivery				
TOTAL Postago and Fees \$				
Postmark or Date				
6/10/02	•			

PS Form 3800, Feb. 1982

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

#### INTEROFFICE MEMORANDUM

For Ro And/Or To	outing To District Offices o Other Than The Addressee
То:	Loctn.:
То:	Loctn.:
То:	Loctn.:
From:	Date:
Reply Optional [	Reply Required [ ] Info. Only [ ]
Date Due:	Date Due:

TO: Regency Square Properties, Inc. File - AC 16-60981

FROM: Bruce Mitchell

DATE: May 9, 1983

SUBJ: Baseline Emissions Inventory Calculations

The attached material will be used as the baseline emissions for the Regency Square Properties, Inc. for the operating years 1980-82. The data was developed using the emission factors from AP-42 Emission Factors (CO,SO2,PM), emission factors established from stack tests performed by Sholtes & Koogler, Environmental Consultants, Inc., in March, 1982 (NO<sub>X</sub>,VOC:non-methane hydrocarbons), and the permitted hours of operation (23,379).

RBM/rbm

cc: John B. Koogler

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

DATE  DATE  DATE  2. BITHAL  DATE  A. BITHAL  DATE  A. BITHAL  DATE  REMARKS:  And delivered to Dr. Koszler  RIVIEW A RETURN  RIVIEW A RETURN  RIVIEW A PRE  MITHAL A PORWARD  DISPOSITION  REVIEW A RESPOND  PREPARE RESPONS  FOR YOUR SIGNATURE  FOR YOUR SIGNATURE  CONCURRENCE  FOR PROCESSIONO  BITHAL A FORWARD  DISTRIBUTE  CONCURRENCE  FOR PROCESSIONO  BITHAL A FORWARD  DISTRIBUTE  CONCURRENCE  FOR PROCESSIONO  BITHAL A RETURN  PROME  DATE  PROME  PROME	ROUTING AND TRANSMITTAL SLIP		
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meeting. Witness was  SET UP MERTING  INVESTIGATE A REPT  MITIAL A FORWARD  DISTRIBUTE  CONCURRENCE  FOR PROCESSING  MITIAL A RETURN  DATE  TO DATE	room after the Oxy	[	FOR MY SIGNATURE
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FROM:	/ NU »	ı	CONCURRENCE
FROM:			FOR PROCESSING
			INITIAL & RETURN
"\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	FROM: Whitehill	DATE	5/4/83 PM

( )=		
letter to cilludi	uno 4 S.d	SENDER: Complete items 1, 2, and 3.  Add your address in the "RETURN TO" space on reverse.
400	38-1	1. The following service is requested (check one.)  Show to whom and date delivered
ڊ ٻ	Jan. 19	☐ Show to whom, date and address of delivery
<u>=</u>	89	Show to whom and date delivered
Marich 16	٠	Show to whom, date, and address of delivery.\$  (CONSULT POSTMASTER FOR FEES)
3		
3	73	2. ARTICLE ADDRESSED TO:
	ET	Mr. Robert C. Gillander
	E	9501 Arlington Expressway
4	RE	Jacksonville, FL 32211
山土ン	ABTURN RECEIPT	3. ARTICLE DESCRIPTION: REGISTERED NO.   CERTIFIED NO.   ENSURED NO.
	•	0157992
•	REGIST	(Always obtain signature of addresses or agent)
	318	-I have received the article described above.
	ERE	- SIGNATURE Addressee DAuthorized agent
	Ü	Shari Viasa
	SS	John King
	JAE	DATE OF DELIVERY POSTMARK
. 1	ÖA	3/17/85
. ,	Ö	5. ADDITESS (Complete only if racement)
	INSURED AND CERTIFIED MAI	
	031	6. UNABLE TO DELIVER BECAUSE: CLERK'S
	M	
1	-	→ CPD - 1979 200.450

No. 0157992

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—

NOT FOR INTERNATIONAL MAIL

(See Reverse)

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0157030 No.RECEIPT FOR CERTIFIED MAIL MO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL (See Reverse) Mr. Robert C. Gillander STREET AND'NO. P.O., STATE AND ZIP CODE POSTAGE CERTIFIED FEE CONJULT POSTMASTER FOR FEES
OPTIONAL SERVICES SPECIAL DELIVERY RESTRICTED DELIVERY SHOW TO WHOM AND DATE DELIVERED RETURN RECEIPT SERVICE SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY TOTAL POSTAGE AND FEES \$ PS Form 3800, Apr. 1976 POSTMARK OR DATE

Feb 23 letter to cillander

S Form	SENDER: Complete items 1, 2, and 3.  Add your address in the "RE reverse.	TURN TO" space on
3811, Jan. 1979	1. The following service is requested (ch.  Show to whom and date delivere.  Show to whom; date and address.  RESTRICTED DELIVERY.  Show to whom and date delivere.  RESTRICTED DELIVERY.  Show to whom, date, and address.	of delivery¢
	(CONSULT POSTMASTER FOR	FEES)
	2. ARTICLE ACORESSED TO:	7.3
RET	Mr. Robert C. Gilla	ander, Jr.
UR.	9501 Arlington Exp	
R	Jacksonville, FL 32	2211
RETURN RECEIPT; REGIS	REGISTERED NO.   CERTIFIED NO.	INSURED NO.
1, 4	0157030	
EGK	(Always obtain signature of addre	ssee or agent)
3.58	I have received the article described abo	ive.
TERED,	SIGNATURE DAddressee - DAuthoriz	ed agent
	Sheni E- Kin	19
INSURED	DATE OF CELIVERY	POSTMARK
	1 2125/80	-
DINA	5. ADDRESS (Complete only if requested)	
CERTIFIED		3
931	6. UNABLE TO DELIVER BECAUSE	L CLEAKS
MA		
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	REGENCY SQUARE SHOPPING CENTER	GHECK NO 0 0127
Ċŧ	HEGENOT CHECK DATE 1 VENDOR NO SUITE 1200 BARNETT REGENCY TOWER	63-4
00	1766 9/29/82 JACKSONVILLE, FLORIDA 32232-0033	630
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PA	Florida Department of Environmental Regulation	
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	Mar Lea	
	STATE OF FLORIDA  DEPARTMENT OF ENVIRONMENTAL REGULATION,	Nº 33625
	RECEIPT FOR APPLICATION FEES AND MISCE LANGOUS REVENU	
		1
	Received from Planne Square Shopping Centro Date Cor	HULL 1 1780
	Address Suite 1200 Barnett Reserve Journ Dollars \$ 1,0	10.00 / .
	1 Machanielle, FL 32232-003	73 / h
7	Applicant Name & Address Elevni Ga alines	
	Source of Revenue	
\$	Revenue Code Application Number A C	981
	By Protisia 9 11	<u>Xamo</u>

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ompany Name: All 1000031  Permit Number: PSD Number:  PSD Number: PSD Number:	Cross References.	
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Application Applied The Applie		
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In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled <u>Supplementary Documents Drawer</u>. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Regency Square Properties III

Permit(s) Numbered:

AC	16	-	060981
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Period during which document

was received: Detailed Description

APPLICATION 1. 36"×24" BLUEPRINT: SITE PLAN - ATTACHMENT 3 (REVISION NUMBER 8)

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

#### INTEROFFICE MEMORANDUM

	outing To District Offices o Other Than The Addres	
To:	Loctn.:	
То:	Loctn.:	
то:	Loctn.:	
From:	Date:	
Reply Optional [ ]	Reply Required ( )	info. Only [ ]
Date Due:	Date Due:	

TO: Jacksonville's Bio-Environmental Services Division (BES)

FROM: FDER's Bureau of Air Quality Management

Bruce Mitchell Rev

THRU: Bill Thomas

Clair Fancy W

DATE: July 18, 1985

SUBJ: RS Properties III

Based on the recent submittal, dated July 1, 1985 and received by the bureau on July 8, 1985, the referenced facility is a minor facility. Therefore, the bureau is transferring all permitting activities to BES.

cc: John Brown

enclosures

SENDER: Complete items 1, 2, 3 and 4. Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested. 1.  $\square$  Show to whom, date and address of delivery. 2. The Restricted Delivery. 3. Article Addressed to: Mr. Jerry E. Woosley Duval County BES 515 West 6th Street Jacksonville, FL 32206 4. Type of Service: Article Number Registered
Certified
Express Mail ☐ Insured ☐ COD P 408 530 282 Always obtain signature of addressee <u>or</u> agent and <u>DATE OELIVERED</u>. DOMESTIC RETURN RECEIPT 8. Signature -7. Date of Delivery 8. Addressee's Address (ONLY ) (request

P 408 530 282

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IC INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

See Reverse:

	Sent:0 Jerry Woosley,	BES
	Street and No.	
Ì	P.O., State and ZIP Code	
	Postage	\$ .
	Cartified Fee	
	Special Delivery Fae	
	Restricted Delivery Fee	
	Return Receipt Showing to whom and Date Delivered	
	Return Receipt Showing to whom,	
22	Date, and Address of Delivery	
Feb. 1982	TOTAL Postage and Fees	s
ie.	Postmark or Date	

7/18/85

<u>5</u>

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT TERRANCH OFFICE

825 NORTHWEST 23rd AVENUE SUITE G GAINESVILLE, FLORIDA 32601

SOURCE TYPE: Natural Gas Fired Engines



DER

BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

JUL 8 1985

[] New<sup>1</sup> [X] Existing<sup>1</sup>

## APPLICATION TO SPERATE/CONSTRUCT AIR POLLUTION SOURCES

AFFLICATION TIPE: [ ] CONSTRUCTION [ ] OP	eration [ N Modification
COMPANY NAME: R S Properties III *	COUNTY: Duval
Identify the specific emission point source Kiln No. 4 with Venturi Scrubber; Peaking U	(s) addressed in this application (i.e. Lime Air Conditioning Fait No. 2 Gas Fired) Chiller Engines
0501 4 11 1 5	<u> </u>
SOURCE LOCATION: Street 9501 Arlington Ex	xpressway City Jacksonville
UTM: East (17) 447.170 k	Morth 3354.610 km
Latitude 30 ° 19 ' 26	
APPLICANT NAME AND TITLE: James W. Ridgely	, General Manager
APPLICANT ADDRESS: 9501 Arlington Expre	ssway, Room E26, Jacksonville, FL 32211
SECTION I: STATEMENTS	BY APPLICANT AND ENGINEER
A. APPLICANT	
I am the undersigned owner or authorize	d representative* of R S Properties !!!
I agree to maintain and operate the facilities in such a manner as to com Statutes, and all the rules and regulat also understand that a permit, if gran	this application for a construction to the best of my knowledge and belief. Further, pollution control source and pollution control apply with the provision of Chapter 403, Floridations of the department and revisions thereof. It ted by the department, will be non-transferable and upon sale or legal transfer of the permitted
*Attach letter of authorization	Signed: \w.
	J.W. Ridgely, General Manager
	Name and Title (Please Type)
	Date: 7.3.85 Telephone No. 904/725-3830
B. PROFESSIONAL ENGINEER REGISTERED IN FLO	ORIDA (where required by Chapter 471, F.S.)
been designed/examined by me and four principles applicable to the treatment	g features of this pollution control project have not to be in conformity with modern engineering and disposal of pollutants characterized in the le assurance, in my professional judgment, that
1 See Florida Administrative Code Rule 17-2	2.100(57) and (104)

Page 1 of 12

DER Form 17-1.202(1) Effective October 31, 1982

<sup>\*</sup>Formerly Regency Square Properties

ollution sources	•		е,
e e e e	Signed	Sept 1	
Les appearance	<del>-</del>	hn B. Koogler	
3 5 0 3 C	<del> </del>	Name (Please Type)	
TATE OR	co St	OLTES & KOOGLER, ENVIRONMENTAL CONSL	JLTAI
292, 04 04	78!	Company Name (Please Type)	
3).	12	13 N.W. 6th Street, Gainesville, FL	326
43		Mailing Address (Please Type)	
ida Registration	No. 12925 Date:	Telephone No. (904) 377-5	5822
	SECTION II: GENERAL PR	OJECT INFORMATION	
,			•
necessary.	·		
		·	
	See attachment hereto.		
		<u> </u>	
Schedule of proje NA - Modif	ect covered in this spplicstication to operation condit	ion (Construction Permit Application ions of existing facility	n On
NA - Modif	ication to operation condit	ion (Construction Permit Application ions of existing facility empletion of Construction	n On
NA - Modif Start of Construc Costs of pollutio for individual co	ication to operation condition  tionCon  control system(s): (Note components/units of the project	ions of existing facility	s on
NA - Modif Start of Construc Costs of pollutio for individual co Information on ac permit.)	ication to operation condition  tionCon  control system(s): (Note components/units of the project	ions of existing facility impletion of Construction  :: Show breakdown of estimated cost ect serving pollution control purpos hed with the application for operati	s on
NA - Modif Start of Construc Costs of pollutio for individual co Information on ac permit.)	ication to operation conditationConcerts of the projectual costs shall be furnish	ions of existing facility impletion of Construction  :: Show breakdown of estimated cost ect serving pollution control purpos hed with the application for operati	s on
NA - Modif Start of Construc Costs of pollutio for individual co Information on ac permit.)	ication to operation conditationConcerts of the projectual costs shall be furnish	ions of existing facility impletion of Construction  :: Show breakdown of estimated cost ect serving pollution control purpos hed with the application for operati	s on
NA - Modif Start of Construc Costs of pollutio for individual co Information on ac permit.)	ication to operation conditationConcerts of the projectual costs shall be furnish	ions of existing facility impletion of Construction  :: Show breakdown of estimated cost ect serving pollution control purpos hed with the application for operati	s or
NA - Modificate any prev	ication to operation condition  Con control system(s): (Note omponents/units of the projectual costs shall be furnishable; there is no add-on pol	ions of existing facility impletion of Construction  e: Show breakdown of estimated cost ect serving pollution control purposed with the application for operation of the control equipment.	s or es. on
NA - Modificate any prev	ication to operation conditationConcentrol system(s): (Notemponents/units of the projectual costs shall be furnishable; there is no add-on polectus DER permits, orders as permit issuance and expirate	ions of existing facility impletion of Construction  e: Show breakdown of estimated cost ect serving pollution control purposed with the application for operation of the control equipment.	s on es.
NA - Modificate any prevolution of Applicate AO16	ication to operation conditationConcentrol system(s): (Notemponents/units of the projectual costs shall be furnishable; there is no add-on polectus DER permits, orders as permit issuance and expirate	ions of existing facility impletion of Construction  E: Show breakdown of estimated cost ect serving pollution control purpose and with the application for operation of the control equipment.  Indicates associated with the emission dates.  -40548 and A016-45674 expiring 7/31/	s on es. on

#### SECTION III.

A. Modification to existing facility and permit (AC16-60918) to permanently retire all motor driven electric power generating units (4 diesel/natural fired Worthington units and 4 natural gas fired Caterpillar units) and to increase the permitted NOx emission rate and hours of operation of two (2) natural gas fired motor driven air conditioning chillers. (Note: The facility originally consisted of 6 dual fuel fired Worthington and 7 gas fired Caterpillar electric power generating units. A modification to permit AC16-60918 prepared in December 1984 proposed the retirement of 2 Worthington and 3 Caterpillar units.)

Each of the air conditioning chillers will be driven by a natural gas fixed Caterpillar engine. Each engine is rated at 775 horsepower and has a maximum fuel firing rate of 6469 cubic feet of natural gas per hour.

	<u> </u>	
		-
	·	
	this is a new source or major modification, answer the following ques es or No)	tions. Not Applicab
ı.	Is this source in a non-attainment area for a particular pollutant?	
	a. If yes, has "offset" been applied?	
	b. If yes, has "Loweat Achievable Emisaion Rate" been applied?	
	c. If yes, list non-attainment pollutants.	
2.	Does best available control technology (BACT) apply to this source? If yes, see Section VI.	
3.	Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	
4.	Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	
5.	Do "National Emission Standards for Hazsrdous Air Pollutants" (NESHAP) apply to this source?	·
	"Reasonably Available Control Technology" (RACT) requirements apply this source?	
	a. If yes, for what pollutants?	

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

#### SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

	Contam	inants	Utilization	I	
Description	Туре	% Wt	Rate - lbs/hr	Relate to Flow Diagram	
	·				
Not Applicable	- fuel use on	y; see Sectio	n IIIE		

B. Pro	ess Rate,	if	applicable:	(See	Section	Ÿ,	Item :	1)
--------	-----------	----	-------------	------	---------	----	--------	----

1.	Total Process Input Rate (lbs/hr):	NA .
2	Product Weight (lhs/hr).	NA

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of	Emission <sup>1</sup>		Emission <sup>1</sup>		Allowed <sup>2</sup> Emission Rate per	Allowable <sup>3</sup> Emission	Potent Emiss		Relate to Flow
Contaminant_	Maximum lbs/hr	Actual T/yr	Rule 17-2	lbs/hr	lbs/yr	T/yr	Diagram		
NO×	7.2	31.5	None	7.2	7.2	31.5			
CO	5.6	24.4	None	5.6	5.6	24.4			
Non-methane HC	1.8	7.9	None	1.8	1.8	7.9			
so <sub>2</sub>	<b>〈</b> 0.1	<b>(</b> 0.1	None	<b>&lt;</b> 0.1	<0.1	<0.1			
PM	<0.1	<b>&lt;</b> 0.1	None	< 0.1	<0.1	<b>〈</b> 0.1			

<sup>1</sup> See Section V, Item 2. NOTE: All emissions are total for  $\underline{\mathsf{two}}$  engines.

<sup>&</sup>lt;sup>2</sup>Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

<sup>&</sup>lt;sup>3</sup>Calculated from operating rate and applicable standard.

 $<sup>^{4}</sup>$ Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Conteminent	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Not Applicable - no	add-on control	equipment.		
		, i		

#### E. Fuels

	Consum		
Type (Be Specific)	avg/hr	max./hr	Maximum Heat Input (MMBTU/hr)
Natural Gas	0.006	0.013	13.5
•	(total 2 engines)	(total 2 engines)	(total 2 engines)

\*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

_					
Fue	1	Ana	Ţν	91	9:

Percent Sulfur:	Nil		Percent Ash:	Nil		
Density:	NA NA	lbs/gal	Typical Percent	Nitrogen:	Nil	
Heat Capacity: _	1045 BTU/ft <sup>3</sup>	BTU/1b				_ BTU/gal
Other Fuel Conta	aminants (which may	cause air p	ollution): Non	e		
	· · ·					
F. If applicab	le, indicate the per	cent of fue	l used for space	heating.		
Annual Average	NA `	Ma	ximum	·		
G. Indicate lie	quid or solid wastes	generated	and method of di	sposal.		: :
No solid o	r liquid wastes are	generated.				
				•	·	
		-				

	on Stack Ge								
Stack Heig	ht:22	<u> </u>		ft.	Stack Dia	mete	r:	./3	t.
Gas Flow R	ete: <u>1875/18</u>	375_ACFM	833/833	DSCFM	Ges Exit	Temp		550/550	
Water Vapo	r Content:	15/15		%	Velocity:		74.7/74.7	F	PS
,									
		SECT			TOR INFOR	MATI	ON		
			(NC	ot Applio I					$\neg$
Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type I (Garbag	II Type je) (Patho ica	log-	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.	)
Actual lb/hr Inciner- ated									
Uncon- trolled (lbs/hr)									
Approximat Manufactur	e Number of	Hours of	Operation	per day	·	day/	wk	hr)wks/yr	
	:	Volume (ft) <sup>3</sup>	Heat R	elease /hr)	Туре	Fuel	BTU/hr	Temperature (°F)	
Primary C	Chamber				-		· · · · ·		
Secondary	Chamber	•.	<u> </u>						
	ght:							,	
Gas Flow F	Rate:	–	_ACFM	<del></del>	DS 0	FM*	Velocity: _	F	PS
	more tons p					emiss	ions rate i	n grains per sta	1N -
Type of po	ollution con	trol devic	e: [ ] C	yclone	[ ] Wet 9	crub	ber [ ] Af	terburner	
			[] 0	lther (sp	pecify)				
	17-1.202(1) November 30	, 1982		Page 6 d	of 12		•		

	<del></del>	<del></del>	_	·					
						<del> </del>			
Ultimate dispassh, etc.):	osal of an	y effluent	other	than that	emitted	from the	stsck	(scrubber	water,
No lie	quid or sol	id wastes	are ge	nerated.					
						_			

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

#### SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

- 1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
- Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
- 4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
- 5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
- 6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where aclid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
- 7. An 8 1/2" x 11" plot plan showing the location of the eatablishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
- 8. An B 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

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#### SUPPLEMENTAL REQUIREMENTS

#### SECTION V

- 1. Input and Production Rate Not Applicable
- 2-3. Controlled and Uncontrolled Emissions

NOx - from Emissions Tests

Gas flow at rated capacity

- 833 dscfm

 $\rm NOx~(as~NO_2)$  at rated capacity with factor to take into account variations in  $\rm NO_2$  concentrations of individual samples

-600 ppm (v/v)

NOx = 833 cfm x 60 min/hr x  $10^{-6}$  x 1/385 ft 3/1b-mole x 46 lb/lb-mole x 600 ppm

x 46 lb/lb-mole x 600 |

= 3.6 | b/hr/engine  $\times$  8760/2000  $\times$  2

= 31.5 tpy (both engines)

CO - AP-42, Section 3.3.2

Emission factor

-  $430 \text{ lb/} 10^6 \text{ft}^3 \text{ gas}$ 

Firing rate of gas at engine capacity of 775 horsepower

 $-6469 \text{ ft}^3/\text{hr}$ 

 $CO = (6469/10^6) MM ft^3/hr \times 430$ 

= 2.8 lb/hr/engine

 $\times$  8760/2000  $\times$  2

= 24.4 tpy (both engines)

Non-Methane Hydrocarbons - AP-42, Section 3.3.2

Emission factor

 $-140 \text{ lb/}10^6 \text{ ft}^3 \text{ gas}$ 

 $VOC = (6469/10^6) \times 140$ 

= 0.9 lb/hr/engine

× 8760/2000 × 2

= 7.9 tpy (both engines)

 $SO_2$  - AP-42, Section 3.3.2

Emission factor

 $-0.6 \text{ lb/}10^6 \text{ ft}^3 \text{ gas}$ 

 $SO_2 = (6469/10^6) \times 0.6$ 

= **<**0.1 lb/hr/engine

 $\times$  8760/2000  $\times$  2

=  $\langle 0.1 \text{ tpy (both engines)} \rangle$ 

#### Particulate Matter - AP-42, Section 3.3.2

Emission Factor - Nil

 $PM = \langle 0.1 | lb/hr/engine$ 

= < 0.1 tpy (both engines)

- 4. Air Pollution Control Specifications Not applicable since there is no add-on air pollution control equipment.
- 5. Control Efficienty Not Applicable.
- 6. Flow Diagram Attachment 1.
- 7. Location Map Attachment 2.
- 8. Plot Plan Attachment 3.

9.	The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.								
10.	With an application for operation perstruction indicating that the source permit.	mit, attach a Certificate of Completion of Conwas constructed as shown in the construction							
	SECTION WI. DEST AV	AILABLE CONTROL TECHNOLOGY							
		plicable) stationary sources pursuant to 40 C.F.R. Part 6							
Α.	applicable to the aource?	stationary sources pursuant to 40 C.F.R. Part 6							
	[ ] Yes [ ] No								
	Contaminant	Rate or Concentration							
	Contaminant	kate or toncentration							
	·	<del>-</del>							
	· ,	<u> </u>							
•									
в.	Has EPA declared the best available cyes, attach copy)	control technology for this class of sources (I							
	[ ] Yes [ ] No								
	Contaminant	Rate or Concentration							
		Race of Concentration							
_	<u> </u>								
-									
с.	What emission levels do you propose as	best available control technology?							
•	Contaminant	Rate or Concentration							
	·								
Đ.	Describe the existing control and trea	itment technology (if any).							
	1. Control Device/System:	2. Operating Principles:							
	3. Efficiency:*	4. Capital Costs:							
#E>	plain method of determining								
	R Form 17-1.202(1)								
		age 8 of 12							

5.	Useful̃ Life:		6.	Operating Costs:					
.7.	Energy:		8.	Maintenance Cost:					
9.	Emissions:								
	Contaminant			Rate or Concentration					
		<del></del>							
				·					
				·					
10.	Stack Parameters								
a.	Height:	ft.	ь.	Diameter:					
c.	Flow Rate:	AC FM	ď.	Temperature:					
е.	Velocity:	FPS							
	scribe the control and treatments and accessary		olog	y available (As many types as applicat					
1.									
а.	Control Device:		b.	Operating Principles:					
c.	Efficiency: 1		d.	Capital Cost:					
e.	Useful Life:		f.	Operating Cost:					
g.	Energy: <sup>2</sup>		h.	Maintenance Cost:					
i.	Availability of construction	materia]	ls an	d process chemicals:					
j.	. Applicability to manufacturing processes:								
k.	Ability to construct with conwithin proposed levels:	ntrol de	vice	, install in available space, and ope					
2.									
a.	Control Device:		b.	Operating Principles:					
c.	Efficiency: 1		d.	Capital Cost:					
е.	Useful Life:		. <b>f.</b>	Operating Cost:					
g.	Energy: <sup>2</sup>	. ,	h.	Maintenance Cost:					
i.	Availability of construction	materia:	ls an	d process chemicals:					
	in method of determining effici								
rnerg	y to be reported in units of el	ectrical	r bom	er - Kwh design rate.					
ER Fo	rm 17-1.202(1)								
ffect	ive November 30, 1982	Page	9 of	12					

- Applicability to manufacturing processes: j. Ability to construct with control device, inatall in available space, and operate k. within proposed levels: 3. Control Device: Operating Principles: Efficiency: 1 Capital Cost: c. Useful Life: Operating Cost: Energy: 2 Maintenance Cost: h. Availability of construction materials and process chemicals: i. Applicability to manufacturing processes: j. Ability to construct with control device, install in available space, and operate k. within proposed levels: Δ. Control Device: Operating Principles: Efficiency: 1 Capital Costs: Useful Life: Operating Cost: Energy: 2 q. Maintenance Cost: Availability of construction materials and process chemicals: Applicability to manufacturing processes: Ability to construct with control device, install in svailable space, and operate within proposed levels: Describe the control technology selected: Control Device: 2. Efficiency: 1 Capital Cost: Useful Life: 3. Energy: 2 5. Operating Cost: 6. 7. Maintenance Cost: Manufacturer: Other locations where employed on similar processes:
  - a. (1) Company:
  - (2) Mailing Address:
  - (3) City:

(4) State:

 $^{1}\mathsf{Explain}$  method of determining efficiency.  $^{2}\mathsf{Energy}$  to be reported in units of electrical power - KWH design rate.

DER Form 17-1.202(1) Effective November 30, 1982

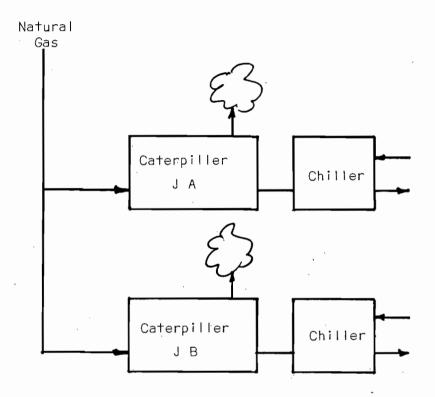
	(5) Environmental Manager:	•
	(6) Telephone No.:	
	(7) Emissions: 1	
	Contaminant	Rate or Concentration
		· · · · · · · · · · · · · · · · · · ·
	(8) Process Rate: 1	
	b. (1) Company:	
	(2) Mailing Address:	·
	(3) City:	(4) State:
	(5) Environmental Manager:	
	(6) Telephone No.:	
	(7) Emissions: 1	· 1
	Contaminant	Rate or Concentration
	(0)	
	(8) Process Rate: 1	. "
l App ava	10. Reason for selection and description olicant must provide this information who silable, applicant must state the reason(s	en available. Should this information not be a) why.  OF SIGNIFICANT DETERIORATION
Α.	Company Monitored Data	
	1no. sites TSP _	() SO <sup>2</sup> * Wind spd/dir
	Period of Monitoring ${\text{month}}$	day year month day year
	Other data recorded	
	Attach all data or statistical summaries	to this application.
<b>*</b> 5p	ecify bubbler (B) or continuous (C).	
	Form 17-1.202(1) ective November 30, 1982 Page	11 of 12

	a. b.	Was instrumentati			d or its	equivale	ent?	[ ] Yes	[ ] N	•
			on calibr							•
		f 1 V = f 1 V=		ated in	accorda	nce with	Depar	tment p	rocedur	вв?
		[ ] Yes [ ] No	[ ] Unkno	₩N						
в.	Met	eorological Data U	sed for A	ir Qual	ity Mode	ling				
	1.	Year(s) of	data from	month	/ / day ye	ar mon	/nth d	/ ay yea	r .	
	2.	Surface data obta	ined from	(locat	ion)					
	3.	Upper air (mixing	height)	data ob	tained f	rom (loca	ation)			
	4.	Stability wind ro	se (STAR)	data o	btained	from (loc	cation	)		
с.	Com	puter Models Used						•		
	1.		·			Modif:	ied?	If yes,	attach	description.
	2.					Modifi	ied?	If yes,	attach	deacription.
	3.					Modif:	ied?	If yes,	attach	description.
	4.									description.
		ach copies of all le output tables.							•	
D.	Applicants Maximum Allowable Emission Data									
	Pol	lutant	Ε	mission	Rate					
		TSP					_ gram	s/sec		
		502					_ gram	8/sec		
٤.	Emission Data Used in Modeling									
	poi	ach list of emissi nt source (on NEDS normal operating	point nu	s. Emi umber),	ssion da UTM coo	ta requi: rdinates,	red is stac	source data,	name, o allowat	description o ole emissions
F.	Att	ach all other info	rmation s	upporti	ve to th	e PSD re	view.			

the requested best available control technology.

Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

Attach scientific, engineering, and technical material, reports, publications, jour-nals, and other competent relevant information describing the theory and application of



FLOW DIAGRAM
AIR CONDITIONING CHILLERS

R S PROPERTIES III
JACKSONVILLE, FLORIDA

SHOUTES \* KOOGLER

BARM 3468, 1985

SKEC 258-83-01

July 1, 1985

Mr. Clair Fancy
Deputy Bureau Chief
Bureau of Air Quality Management
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tailahassee. Florida 32301

DER

JUL 8 1985

BAQM

Subject: RS Properties III

(formerly Regency Square Properties, Inc.)

Duval County, Florida Permit AC 16-60981

Dear Mr. Fancy:

Enclosed is an application for a construction permit to modify the permit conditions for mechanical equipment operated by RS Properties III. The permitted facility was formerly referred to as the Total Energy Plant operated by Regency Square Properties, Inc.

The original permit application for the referenced facility called for the operation of six electric power motor generator sets driven by Worthington engines that could be fired with natural gas or a mixture of natural gas and diesel fuel; seven electric power motor generator sets driven by natural gas fired Caterpillar engines; and two air conditioning chillers driven by natural gas fired Caterpillar The permit conditions for the original permit were essentially agreed upon when, because of equipment considerations, Regency Square Properties requested a modification to the permit conditions (in November 1984). This permit modification called for the permanent retirement of two of the electric power generators driven by Worthington engines and three of the electric power Caterpillar units driven by enaines modifications to the operating conditions of the remaining units.

As a result of a management change (from Regency Square Properties to RS Properties III) a decision has since been made to retire all electric power generating units at the facility and to purchase all the electric power required for operating the Regency Square Shopping Center from the Jacksonville Electric Authority. The only remaining operating equipment at Regency Square will be the two air conditioning chillers driven by natural gas fired Caterpillar engines. This permit modification addresses the retirement of the electric power generating units and requested permit conditions for the air conditioning chillers.

The two air conditioning chillers are each driven by Caterpiliar engines rated at 775 horsepower. The engines are fired at a maximum rate of 6469 cubic feet of gas per hour per engine with gas having a heating value of 1045 BTU per cubic foot. It is requested that the permit issued for these two units allow each engine to operate at a maximum of 8760 hours per year. The emission limitations now requested for the engines are based on emission measurements conducted on the engines in December 1983. A copy of the referenced test report has been forwarded to your office during previous permit negotiations.

During previous permit negotiations, baseline operating conditions for the Worthington and Caterpiliar engines at the Regency Square Shopping Center were established. These operating conditions were summarized in Table 4 of a letter to you from SKEC dated June 29, 1984. A copy of this table, showing the baseline operating conditions is attached hereto.

The operating conditions for the two Caterpillar engines driving the air conditioning chillers have been calculated and are presented in the attached application for an air poliution source construction permit. These operating conditions and the baseline operating conditions summarized in the referenced Table 4 are summarized in Table 1 of this letter.

The information presented in Table 1 demonstrates that under currently proposed operating conditions, there will be a decrease in engine operating hours, fuel consumption and the annual emission rate of all air pollutants over conditions that existed during the baseline. There will be a greater reduction in operating hours, fuel use and emissions between proposed conditions and conditions that were originally proposed in the application for the subject construction permit and in conditions proposed in the modification to the subject construction permit submitted in November 1984.

Based upon the information provided herein, we request that the review of the subject air pollution source construction permit be continued. If additional information is required to complete the review of the subject permit, please feel free to contact me.

Very truly yours,

SHOLTES & KOOSLER,

ENVIRONMENTAL CONSULTANTS

John B. Koogler, Ph.D., P.E.

JBK:pdt Enclosures

cc: Mr. Bruce Mitchell

Mr. Jerry Woosley

Mr. John Brown

Mr. Bill Johnson

TABLE 1 SUMMARY OF BASELINE AND PROPOSED OPERATING CONDITIONS

#### RS PROPERTIES III JACKSONVILLE, FLORIDA

Parameter	Baseline <sup>(1)</sup>	Proposed (2)	<u>Change</u> + (-)
Generating Capacity (kw/yr)	22.26 × 10 <sup>6</sup>	0 .	(22.226 × 10 <sup>6</sup> )
Engine Operating Hours (hr/yr)	23,379	17,520	(5859)
Fuel Consumption Diesel (gal/yr) Gas (ft³/yr)	$78.39 \times 10^3$ $246.4 \times 10^6$	0 113.3 × 10 <sup>6</sup>	$(78.39 \times 10^3)$ $(133.1 \times 10^6)$
Emissions (tons/yr	)	•	
NO.	167.3	31.5	(135.8)
voč	8.6	7.9	(0.7)
œ	49.0	24.4	(24.6)
SO <sub>2</sub> PM <sup>2</sup>	1.4	<0.1	(1.4)
PM <sup>2</sup>	1.4	<0.1	(1.4)

<sup>(1)</sup> See attached Table 4 from letter dated 6/29/84.(2) See attached permit application.

#### TABLE 4

### PROPOSED OPERATING CONDITIONS FOR ALL ENGINES; EXISTING PLUS PROPOSED

REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

. 11.1	Annual Generating	Annual Operating	Annual Fuel Co	Annual Fuel Consumption			Annual Emissions (†py)				
Condition	Capacity (kw)	Time (hrs)	Diesel (gal)	Gas (11 <sup>3</sup> )	NOx	HC	co,	so <sub>2</sub>	PM		
Permitted/Actual	22.26 × 10 <sup>6</sup> (1)	23,379	78.39 × 10 <sup>3</sup>	246.4 × 10 <sup>6</sup>	167.3	8.6	49.0	1.4	1.4		

(Baseline operating conditions as summarized in correspondence from SKEC to FDER dated 6/29/84)

Attachment

SKEC 258-83-01

February 20, 1985

DER

FEB 21 1985

BAQM

Mr. Bruce Mitchell Florida Department of Environmental Regulation Twin Towers Office Building 2600 Blair Stone Road Tallahassee, Florida 32301

Subject: R. S. Properties III

Internal Combustion Engine Duvai County, Florida

Dear Mr. Mitchell:

In accordance with our recent discussions, I am enclosing a copy of our report entitled, "EMISSION TESTS, REGENCY SQUARE PROPERTIES, INC., INTERNAL COMBUSTION ENGINE". This report details the testing we conducted for oxides of nitrogen and visible emissions evaluations performed in December, 1983 and is being forwarded for your files.

If you have any questions or require any further information, please contact me.

Very truly yours,

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS

John B. Koogler, Ph.D., P.E.

JBK:ssc Enclosure

cc: Mr. Bill Johnson

**BAQM** 

EMISSION TESTS
REGENCY SQUARE PROPERTIES, INC.
INTERNAL COMBUSTION ENGINE

DECEMBER 1983

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS, INC.
1213 N.W. 6TH STREET
GAINESVILLE, FLORIDA 32601
(904) 377-5822

#### TABLE OF CONTENTS

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2.0	TEST PROCEDURES	3
3.0	TEST RESULTS	5
	APPEND IX	

#### 1.0 INTRODUCTION

The Regency Square power generating facility has been in existence for many years and during that period has experienced several expansions in the generating capacity, the last of which resulted in the need for a PSD review through the offices of the Florida Department of Environmental Regulation (FDER) and the U.S. Environmental Protection Agency (EPA) Region IV. These procedures have extended over many months and resulted in FDER Permit AC 16-60981 in the late summer of 1983. The review and permit anticipate the operation of six (6) rather large Worthington engines of various sizes, and in addition, the operation of seven (7) Caterpillar engines, each having a rating of 775 brake horsepower. Two of these seven Caterpillar engines are devoted to air conditioning service and are not involved in the generation of electricity.

In late 1983, the operation and responsibility for this generating plant and, for that matter the Regency Square Shopping Center, was transferred from Regency Square Properties, Inc. to new owners. The new operating company, R. S. Properties III, is adopting a different philosophy from that existing in past years, insofar as this generating plant is concerned. The new philosophy is headed toward

having this plant exist as a strictly emergency stand-by facility with electric power being purchased in normal use from the Jacksonville Electric Authority. This change in philosophy has had spin-off effects in terms of investment, maintenance and repair.

At the time of the testing reported herein, a decision had been made to completely cease operation of Worthington Engines Nos. 1 and 6. Additionally, two of the Caterpillar engines in electric generating service were permanently retired. The operating engines were tested in the condition which existed, which limited the power production capabilities of the engine in question.

These tests were witnessed in part by Mr. George Hawkins of the Bio-Environmental Services Division, City of Jacksonville.

#### 2.0 TEST PROCEDURES

Permit AC 16~60981 calls for compliance tests at 90-100 percent of maximum permitted capacity. Tests are to be conducted for oxides of nitrogen using Method 7 and visible emissions using Method 9.

Engine loads and fuel consumption were recorded using equipment Engine load on the electrical generating equipment was readily obtained from kilowatt meters installed as part of the electrical generating plant installation. Fuel consumption turned out to be somewhat of a problem in that one fuel meter proved to be inoperative while the others did not correlate with the total fuel meter installed by the local gas company. The gas company meter was a digital unit whose smallest increment of change was 1,000 cubic feet of gas. On the final day of testing for reasons known only to the gas company, the entire gas meter was physically removed from the Regency Square location and gas supplied through a by-pass line. Therefore, no gas consumption figures were available from that meter on that final day of testing. The Regency Square power plant was literally receiving gas without charge on this occasion. Reported gas consumption figures are based on the in-plant meters.

Engine load on the two chiller engines, JA and JB is totally dependent on the air conditioning load developed by the shopping center. On the test of JB on December 12, 1983, there was some load but less than full load. There is no instrument to quantify this load. The test on engine JA on December 15, 1983 was completed without appreciable load, the weather being somewhat cool.

Nitric oxides emissions were specified to determine EPA Reference Method 7. This method was followed with the exception of two tests wherein only 11 replicate samples were obtained instead of the specified 12. Upon arrival at the test site, two flasks out of a set of 48 had disappeared while in transit from the laboratory to the Regency Square plant. It is suspicioned that these were blown out of the transporting vehicle and lost along the highway. No problems were experienced in the Method 7 operations.

Visible emissions were specified to be carried out by EPA Reference Method 9. These emissions were determined by a certified visible emission observer using Method 9 with the possible negative factor that cloudy skies persisted during many of the observations.

Total flue gas flow was determined using EPA Reference Methods 1 and

2. No problems were experienced in carrying out these determinations.

#### 3.0 TEST RESULTS

Table 1 summarizes the raesults of these tests. The Worthington engines comfortably comply with take permit provisions, whereas the Caterpillar engines consistently exceed the permit limit for oxides of nitrogaen. In view of the consistency of the Caterpillar results, it is suggested that take permit limit of 0.2 pounds per hour was based on inadequate data. The apparent compliance of the JA chiller engine is attributated to the lack of air conditioning load during the taest period. It is suggested that at a heavy or even reasonable load condition, this engine would also exceed the 0.2 pounds per hour limit.

All engines complied with the permitted limits for opacity of emissions.

Resource data used in the development of Table 1 are included in the Appendix of this report.

TABLE 1
SUMMARY OF EMISSION MEASUREMENTS

### REGENCY SQUARE POWER PLANT JACKSONVILLE, FLORIDA

				Estimated	Ni	trogen 0x	ides	Ot	pacity
Engine	Flow SCMM	Temperature °F	Load KW	Fuel Consumption (ft.3/hr)	Conc. ppm	Conc.  bs/hr	Permit Limit Ibs/hr	Observed Percent	Permit Limit Percent
Worthingtons									
2	92.7	608	940	3060	974	14.7	22.6	0.0	5
3	76.3	560	1040	3700	621	7.7	37.9	4.4	5
4	69.2	914	1460	5075	644	7.2	12.0	14.8	15
6	140.0	480	1550	5500	1112	25.2	31.2	4.2	5
Caterpillars in	n Electrical	Service							
3	23.4	493	420	*	194	0.74	0.20	0.0	5
10	22.1	516	402	*	223	0.80	0.20	0.0	5
11	25.8	525	410	*	163	0.68	0.20	0.0	- 5
Caterpillars in	n Chiller Ser	vice							
JA	5.6	332	*	*	213 .	0.19	0.20	0.0	5
JB	18.4	357	*	*	344	1.03	0.20	0.0	5

<sup>\*</sup> NOT AVAILABLE

APPENDIX

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant DATE: December 12, 1983

SOURCE:

JB Chiller Caterpillar

TIME: 1330

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Opacity			
Number	Start - End	Sum	Average		
1	1330 - 1335	0	0		
2	1336 - 1341	0	0		
3	1342 - 1347	0	0		
4	1348 <b>–</b> 1353	0	0		
5	1354 - 1359	0	0		

Readings ranged from 0 to 0 percent Opacity. The source was In compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

This certificate expires on

Certification Officer ER Form PERM 5-9 (Jun 79) Bearer's Signature

Certificate Expires: June 15, 1984

## SHOLTES & KOCKLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

Plant _	Reg JB	uney	s Az	Narl			12-9		Wind Obser	Direction and Speed	1 1 - 20 - 10
sec. min.  0  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	· · · · · · · · · · · · · · · · · · ·	15 000000000000000000000000000000000000	30	45	Time  sec. min.  30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58	133	15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 000000000000000000000000000000000000	4.5 000000000000000000000000000000000000	Sum of # Recorded Total # of Readir Opacity = Sum of Total Plume Descri coning lofting fanning Point of Obs	Recorded of Readings of Readings  Detached  Color  looping  funigating  ervation  Distance to base of Source  Height of discharge above ground 22  Description Blue Sh
29		10	20	0	59	P	0	0	0		& IT

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 15, 1983

SOURCE:

JA Chiller Caterpillar

TIME: 1340

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	0	pacity
Number	Start - End	Sum	Average
	1740 1745		
2	1340 - 1345 1346 <del>-</del> 1351	0 0	0
3	1352 - 1357	0	0
4	1358 <b>-</b> 1403	0	0
5	1404 - 1409	0	0

Readings ranged from 0 to 0 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

His certificate expires on

Certification Officer DER Form PERM 5-9 (Jun 79)

Signed:

Certificate Expires: June 15, 1984

Kodney Craw

### SHOLTES & KOCKLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

Plant Regency Stack Journal	Square	Date <u>/2</u> -	- <i>15-83</i> 10-1410	erver RC Paul		
sec. min.  0 15  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 45 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	sec. min. 0  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49	15 30	Sum of # Recorded Total # of Readin Opacity = Sum of Total Plume Descri coning lofting fanning Point of Obs	d O  ngs 120  Recorded of Readings of Readings  ption  Detached Color  looping funigating	
20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		50 51 52 53 54 55 56 57			Description <u>Onena</u>	

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 13, 1983

SOURCE:

No. 11 Caterpillar

TIME: 0950

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Opacity			
Number	Start - End	Sum	Average		
1	0950 - 0955	0	0		
2	0956 - 1001	0	0		
3	1002 - 1007	0	0		
4	1008 - 1013	0	0		
5	1014 - 1019	0	0		

Readings ranged from 0 to 0 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

This certificate expires on

Certification Officer BER Form PERM 5-9 (Jun 79) Bearer's Signature

Signed: Kodny C. Paul

Certificate Expires: June 15, 1984

. BUTE . .

# SHOLTES & KOOTLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

	1	
4	<b>&gt;</b>	<

Plant <u>犬</u> Stack <u>#/</u>	Plant Regining Square Stack #11 Cat							102	3		Wind Direction and Speed Van 3ta5  Observer RCPaul		
sec.	0	15	30	45		sec.	0	15	30	4.5	Sum of # Recorded		
0	2	0	8	0		30 31					Total # of Readings		
2 3	8	8	8	8		32					Opacity = Sum of # Recorded = Total # of Readings		
4 (		2	0	0	1	34					<u>_</u>		
6	0	0	8	0	i	35 36	-				Plume Description		
	2	0	0	(2)		37					coning Detached		
9 7	2	0	0	0	ļ.	39 40			_		lofting Color		
11 /	2	0	0	0		41					fanninglooping		
12 <i>(</i> 13 <i>(</i>		00	00	0	ļ	42					funigating		
14 0	2	0	0	0	}	44			-		Point of Observation		
16 6	2	8	8			46					Distance to base		
18	Ó	0	()	0	<u> </u>	47					of Source 30 Height of discharge		
19	9	0	0	0		49 50	,				above ground /8/		
21	3	8	0	8	1	. 51					Back Ground Description <u>Aversage</u>		
23 /	2	0	0	0		52 53					But Grown bescription /// versay		
	2	0	0	0		54 55					Diagram of Stack		
26 0	5	0	0	0	<u> </u>	56							
61	2	Q		<i>U</i>	)	57					)		

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 15, 1983

SOURCE:

No. 10 Caterpillar

TIME: 0950

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Opacity			
Number	Start - End	Sum	Average		
1	1340 - 1345	0	0		
2	1346 - 1351	0	0		
3	1352 - 1357	0	0		
4	1358 - 1403	0	0		
5	1404 - 1409	0	0		

Readings ranged from 0 to 0 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

This certificate expires on

Certification Officer

Bearer's Signature SER Form PERM 5-9 (Jun 79)

Signed: Kodny C.Paul

Certificate Expires: June 15, 1984

### SHOLTES & KOXILER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

	1	Ì		
	7		<	
1			`	

Plant 🔀 Stack 🚁	egs +10	iniz Cas	y S	qua	<u>_</u>	Date	12-14 134	5-87 0-14	10	Wind Obser	Direction and Speed 16510
sec.	0	15	30	45		sec.	0	15	30	4.5	Sum of # Recorded
0	9	0	0	0		30					Total # of Readings 120
2	0	0	8	0		32					Opacity = Sum of # Recorded = 0
4 5	0	0	0	0	1	34					Total # of Readings ————————————————————————————————————
6 7	0	0	0	6		36 37					coning Detached
8 9	0	0	8	0	<u> </u>  -	38 39					lofting_ Color
10 11	0	8	8	8		40	-		•		fanninglooping
12 13	0	0	0	0		42					funigating
14 15	0	0	0	0	}	44					Point of Observation
16 17	8	0	8	0		46					Distance to base, of Source 35
18 19	8	0	0	0	]	48					Height of discharge above ground 20
20	8	2	8	0		50 · 51					
22	0	0	8	0		52 53					Back Ground Description O wasa
24 25 26	0	0	8	0	1	54 55			,		Diagram of Stack
27 28	7	8	8	000		56 57					
20	4	16	()		J .	58		1			

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 13, 1983

SOURCE:

No. 3 Caterpillar

TIME: 1310

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Ор	acity
Number	Start - End	Sum	Average
1	1310 - 1315	0	0
. 2	1316 - 1321	0	0
3	1322 - 1327	0	0
4	1328 - 1433	0	0
` 5	1434 - 1439	0	0

Readings ranged from 0 to 0 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

the STATE OF FLORIDA wisible emissions evaluation training and is a qualified observer of visible emissions as specified by

EPA reference method 9.

Certification Officer ER Form PERM 5-9 (Jun 79)

Signed: Kodny Pau

Certificate Expires: June 15, 1984

المداد والمناوية والمناوية

### SHOLTES & KOXILER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

Plant Regimes Aquare	Date 12-13-83	Wind Direction and Speed $4J-3-8$
Plant Regiment Aquare Stack #3 Cat	Time 1310-1340	Observer RC Paul
sec. 0 15 30 45	sec. min. 0 15 30	4.5 Sum of # Recorded
0 0 0 0	30 31	Total # of Readings
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32	Opacity = Sum of # Recorded = Total # of Readings
5 0 0 0	34 35 36	Plume Description
7 0 0 0 0	37 38	coning Detached
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	39 40 41	lofting Color
12 0 0 0 0	42 43	fanning looping fumigating
14 0 0 0 0 15 0 0 0 0	44 45	Point of Observation
17 0 0 0 18 0 0 0	46 47 48	Distance to base of Source 30 Height of discharge
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	50	above ground 201
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	51 52 53	Back Ground Description Ontrea
25 0 0 0	54	Diagram of Stack
26 0 0 0 0 27 0 0 0 0	56	

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 13, 1983

SOURCE:

No. 3 Worthington

TIME: 0950

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Op	acity
Number	Start - End	Sum	Average
1	0950 <b>-</b> 0955	0	0
2	0956 - 1001	20	0.8
3	1002 - 1007	105	4.4
4	1008 - 1013	15	0.6
5	1014 - 1019	55	2.3
6	1020 - 1025	45	1.9
7	1026 - 1031	20	0.9
8	1032 - 1037	35	1.5
9	1038 - 1043	55	2.3
10	1044 - 1049	0	0

Readings ranged from 0 to 5 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

This certificate expires on

Certification Officer SER Form PERM 5-9 (Jun 79) Bearer's Signature

Signed: Rodny (Paux

Certificate Expires: June 15, 1984

- 4.5.3. Tr

## SHOLTES & KOOTLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

Plant _	Rege	nly	Sp	iias		Date	12-1	13-8	3	Wind	Dire	ction and Spe	eed <u>Vari - 3 to 5</u>
Plant Rogency Aprilare Stack #3 Worth					Time	950	-105	0	Obse	rver	RC.Pa.	A	
sec.	0	15	30	45		sec.	0	15	30	4,5	Su	m of # Record	ded
0	0	8	0	0	<u> </u>	30 31	8	5	0	0	To 45/1.9	tal # of Read	dings
3	8	8	8			32 33 34	00	0	2	2	Op.	acity = Sum o	of Recorded =
5	0	0	0	0	-	35 36	66/5	5	5	5	-	Plume Desc	<del></del>
7 8 9	0	8	0	0	20/0.8	37 38 39	8	8	8	8	20/	<del></del>	Detached
10 11 12	5	5.	5	3. 3. 3.	_	40 41 42	2	0	0	7)		fanning	
13 14	5	5 5	5	3	105/4.4	43	5	5	3	5	15/		funigating
15 16 17	555	5	5	5	74.7	45 46 47		0	O C	$10^{\circ}$	15/1.5	Point of C	Distance to base / of Source
18 19	70	8	0	0		48	8	0	0	0	-		of Source () Height of discharge above ground
20 21 22	3	0	0	8	15/0.6	50 · 51 52	5	5	5	15	53/2.3		d Description () No can
23	5	5	5	5	-	53 54	5-0	0	8	0	<u>_</u> ,	iagram of St	
25 26 27	5	5	3	0	55/2.3	55 56 57	000	00	0	0	%		<u>ack</u>
28	5	5	5	0		58 59	00	0	0	0			•

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 13, 1983

SOURCE:

No. 4 Worthington

TIME: 1310

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Se†	Time	Op	acity
Number	Start - End	Sum	Average
· 1	1310 - 1315	275	11.5
2	1316 - 1321	220	9.2
3	1322 - 1327	245	10.2
4	1328 - 1333	300	12.5
5	1334 - 1339	320	13.3
6	1340 - 1345	285	11.9
7	1346 - 1351	255	10.6
8	1352 - 1357	320	13.3
9	1358 - 1403	355	14.8
10	1404 - 1409	325	13.5

Readings ranged from 5 to 15percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

has completed the STATE OF FLORIDA wisible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

Bearer's Signature

Certification Officer

6ER Form PERM 5-9 (Jun 79)

Certificate Expires: June 15, 1984

### SHOLTES & KOXTLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

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<b>\)</b>	K

Wind Direction and Speed <u>U-3ta-8</u> Plant Regency Gauare
Stack #4Worthenuter Date 12-13-83 Time 1310-1410 Observer RC Paul sec. sec. min. min. Sum of # Recorded Total # of Readings Opacity = Sum of # Recorded = Total # of Readings Plume Description coning \_\_ Detached \_\_\_\_ lofting Color tax looping fanning \_\_\_ funigating . Point of Observation Distance to base of Source 50 Height of discharge above ground 8 Back Ground Description Openic Diagram of Stack 

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 12, 1983

SOURCE:

2 Worthington No.

TIME: 1330

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Op	acity
Number	Start – End	Sum	Average
1	1330 - 1335	0	0
2	1336 - 1341	Ö	Ö
3	1342 - 1347	0 .	0
4	1348 - 1353	0	0
5	1354 - 1359	0	0
6	1400 - 1405	0	0
7	1406 - 1411	0	0
8	1412 - 1417	0	0
9	1418 - 1423	0	0
10	1424 - 1429	0	0

Readings ranged from 0 to 0 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by

EPA reference method 9. his certificate expires on

Certification Officer SER Form PERM 5-9 (Jun 79) Bearer's Signature

Signed: \_

Kodney C.Paul

Certificate Expires: June 15, 1984

#### **BEST AVAILABLE COPY**

SHOLTES & KOCKLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

5	k
	•

Stack # 2   Time   330 - 1/430   Observer	Plant Regin	y Square	Date 12-1	2-83	Wind Direction an	nd Speed 16-5-10
min. 0 15 30 45 min. 0 15 30 45 Sum of **Recorded **240 O**  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stack #2		Time / 330	-1438	Observer RC	Paul
23 0 0 0 0 53 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stack #2  sec. min. 0 1  0	5 30 45 9 0 0 9 0 0	Time / 330  sec. min.  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51	15 30 0 0 0 0 0 0 0 0 0 0 0 0 0 0	45 Sum of # R Total # of Opacity = Opacity = Opacity Plume coning lofting fanning Point Opacity Back	Recorded
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	24 0 0 25 0 0 26 0 0 27 0 0		54 55 56 57 58	0 0	Diagram	

Sum of # Recorded
Total # of Readings 240
Opacity = Sum of # Recorded = 09
Plume Description
coning Detached
lofting Color
fanninglooping
funigating
Point of Observation
Distance to base of Source 50' Height of discharge above ground 10'
Back Ground Description Blue 9
Diagram of Stack

#### SUMMARY OF VISIBLE EMISSIONS

COMPANY NAME: Regency Square Power Plant

DATE: December 15, 1983

SOURCE:

No. 6 Worthington

TIME: 1100

PERMIT NO .:

AC16-60981

SUMMARY OF AVERAGE OPACITY

Set	Time	Opacity		
Number	Start - End	Sum	Average	
1	1100 - 1105	100	4.2	
2	1106 - 1111	70	2.9	
3	1112 - 1117	60	2.5	
4	1118 - 1123	75	3.1	
5	1124 - 1129	70	2.9	
6	1130 - 1135	75	3.1	
7	1136 - 1141	- 70	2.9	
8	1142 - 1147	55	2.3	
9	1148 - 1153	30	1.3	
10	1154 - 1159	55	2.3	

Readings ranged from 0 to 5 percent Opacity. The source was in compliance with Chapter 17-2, Florida Administrative Code at the time evaluation was made.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

his certificate expires on

Certification Officer GER Form PERM 5-9 (Jun 79)

Bearer's Signature

Kodny CPauf

Certificate Expires: June 15, 1984

### SHOLTES & KOXTLER, ENVIRONMENTAL CONSULTANTS VISIBLE EMISSIONS DATA SHEET

X

Plant Regency Square Stack #66 Dorthington	Date <u>12-15-83</u> Time <u>//00-/200</u>	Wind Direction and Speed $W-5-15$ Observer $RCPaul$
sec. 0 15 30 45  0 5 5 5 5  1 5 5 5 5  2 5 5 5 5  3 5 5 5 5  6 0 0 5 5 5  8 5 6 7 5 0 5 5  8 5 7 5 0 5 5  8 7 5 0 5 5  8 7 5 0 5 5  11 5 5 5 5  12 5 5 5  13 0 0 5 5  14 0 5 5 5  15 0 0 5 5  16 5 5 5 5  18 0 0 5 5  18 0 0 5 5  18 0 0 5 5  18 0 0 5 5  18 0 0 5 5  22 5 5 5  24 5 5 5  25 0 5 5 5  26 0 0 5 5 5  27 6 0 0 5 5  28 5 0 5 5  29 0 5 5 5  20 0 5 5 5  20 0 5 5 5  21 22 5 5 5  22 5 5 5 5  23 5 5 5 5  24 5 5 5 5  25 6 0 5 5 5  26 0 0 5 5 5  27 6 0 0 5 5  28 5 0 5 5 5  29 0 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  20 5  2	sec.       0       15       30         30       0       0       0         31       0       5       0         32       5       5       5         33       5       5       5         34       5       5       5         35       5       5       5         36       5       5       5         37       0       0       0         38       0       0       0         39       0       5       0         40       5       5       5         41       5       5       5         42       5       5       5         43       0       0       0         44       0       0       0         47       5       5       5         49       0       5       5         50       0       0       5         51       0       0       0         51       0       0       0         54       0       0       0         55       0       0       0 <t< td=""><td>Sum of # Recorded  Total # of Readings  Total # of Readings  Plume Description  coning Detached  fanning looping  funigating  Point of Observation  Distance to base, of Source 50  Height of discharge above ground /5  Back Ground Description  Diagram of Stack</td></t<>	Sum of # Recorded  Total # of Readings  Total # of Readings  Plume Description  coning Detached  fanning looping  funigating  Point of Observation  Distance to base, of Source 50  Height of discharge above ground /5  Back Ground Description  Diagram of Stack

Emission Calculations

Engine No #2 with. To= 608 . F = 3735 fpm

As = 1.766 Ft2 NOx = 974 Ppm Mol Wt = 30

Qs = UAs = 3735 × 1.766 = 6596 ACFM

Qqp= Qs( 530) x 0. 02832 =

= 6596 ACFM X 15.01 = 92.70 std meter

3m/min NOx = ppm x M 0.02445 x Astp

= 974 x1227 x 92.70 x10-6

= 110,84 8m/min

= 410.84 8 him x60 = 14.65 lb/hr.

# SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS GAINESVILLE, FLORIDA (904) 377-5822

VELOCITY MEASUREMENT FIELD DATA SHEET

Plant	Rege	ucy
Date	7	12-83
Stack	ム井	Worthington
Test Cond	ducted By:	RSS.
		<b>—</b> '

Traverse Point	ΔΡ
1	.53
2 3 4 5 6 7	~58
3	104
4	,59
5	
6	•54
7	١٦١
8	.68
9	.62
10	
11	
12	
13	
`14	
15	
16	
17	
18	
19	
20_	
21	
21	
23	

24

_		
	Stack	Configuration

U	=	(174)	Avera .8Y (CP)	ige (	√∆P	) (	=	0.78  +S+460 GS	- x	29-92 PS
=		373	_		Ft./M		•	us		29,85

Pb	In.Hg	Pg	_In.Hg.
Stack	Diameter	18 "	
Stack	Area		ft. <sup>2</sup>
Stack	Gas Tempe	erature <u>,</u>	<i>608</i> ° F
Pitot	Tube I.D		

Tr	raverse Point	ΔP
	25	
	26	_
	27	
	28	
	29	-
	30	
	31	
	32	
	33	
	34	
	35	
	36	
	_37	
	38	
	39	
	40	
	41	
	42	
2)	43	
<u>2)</u>	44	
)	45	
	46	
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	
	48	

SHOLTES KOOGLER

Goannie B

1.- 1.0

1-1,2

2-2,2

2-4,5

3-6.6

4-7.8

3-13,5 4-16,8



**TABLE** 

 $NO_X$ 

#### **EMISSION DATA**

PLANT Roserry
STACK Worthington # 2

Run No.	12	X2	<b>#</b> 2	#2
Date	12-12-83	12-12-83	12-12-83	12-12-83
Time	1240	1255	1310	1325
Flask No.	15	23	19	24
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	78 F	79F	8/	83
T <sub>f</sub> = Final Flask Temp., °F	70	71	69	.69
P; = Initial Flask Vacuum, "Hg	28,6	28.6	28.7	28.5
P <sub>f</sub> = Final Flask Vacuum, "Hg	-1.2	-1.1	-1,5	-1.6
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf				à
NO <sub>2</sub> Concentration, ppm	1099	819.9	1125	833.3

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times [\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}], \text{ when } P_{bf} \& P_{bi} =$$

the final and initial barometric pressures.

NO<sub>2</sub> (lbs/scf) = 6.243 x( m ) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

米

TABLE

 $NO_{X}$ 

#### **EMISSION DATA**

PLANT Regency
STACK #2 Worthington

		<del>, , , , , , , , , , , , , , , , , , , </del>	
オン	#2	#2	#2
12-12 -83	12-12-83	12/12/83	12/12/83
- 1340	1355	1410	1425
4	21	22	18
25	25	25	25
85F	83F	83F	86F
71	69	70	.70
- 28.6	28.6	28.4	2816
-1,7	-1.7	-1,9	-2.1
		•	
928,2	1115	1279	862.7
	12-12-83 - 1340 4 25 - 85F 71 - 28.6 -1.7	12-12-83 12-12-83 - 1340 1355 4 21 25 25 85F 83F 71 69 - 28.6 28.6 -1.7 -1.7	12-12-83 12-12-83 12/83 - 1340 1355 1410 4 21 22 25 25 85F 83F 83F 71 69 70 - 28.6 28.6 28.4 -1.7 -1.7 -1.9

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

the final and initial barometric pressures.

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{\mathbf{x}}$ 

### EMISSION DATA

PLANT Regency
STACK Worthington # 2

	· · · · · · · · · · · · · · · · · · ·	<del></del>	T	<del></del>
Run No.	#2	#2	# 52	# 2
Date	12-12-83	12-12-83	12-12-83	12-12-83
Time	1140	1155	1210	1225
Flask No.	17	3	20	46
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	70 F	66F	73F	76F
T <sub>f</sub> = Final Flask Temp., °F	70	71	73	.71
P <sub>i</sub> = Initial Flask Vacuum, "Hg	14.6+14,0	28.6	28.6	28.6
P <sub>f</sub> = Final Flask Vacuum, "Hg	-0,5	-0,2	-0.7	-1.1
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	839.5	915.8	901.9	(4317)

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} = \frac{Pbi - Pi}{Ti}$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x 
$$\frac{1bs}{ft^3}$$
 NO<sub>2</sub>

### Emission Calculations

Engine No #3 North. Ts= 560 . F = 2935 fpm

As = 1.766 ft  $NO_X = 621$  ppm Mol Wt = 30

Qs = UAs = 1935 × 1.766 = 5184 ACFM

Qqp= Qs( 530) x 0.02832 =

= 5184 ACFM X 15.01 = 76.29 std meter

8m/min NOx = Ppm x M 0 102445 x ASHP

= 621 x1227 x 76.29 x10-6

= <u>58,16</u> 8m/min

= 58.16 8 him x60 = 7.69 lb/hr.

Plant	Regerry
Date _	12-13-83

Test Conducted By: RP

Traverse Point	ΔΡ
1	.39
2	.50
3	.51
4	• 4(
5	
6	<b>-</b> 38
1 2 3 4 5 6 7 8 9	. 49
8	+33
9	,20
10	
11	
12	
13	
14	
15	
15 16	
17	
18	
19	
20	
20 21 22 23	
22	
23	
24	

VELOCITY	' MEAS	SUREMENT
FIELD	DATA	SHEET

,
Stack Configuration
<u> </u>

	.s4	,	ΔР	= 0.62		
U = (174)	(CP)	( √∆P	`)(	$\sqrt{\frac{+S+460}{GS}}$	×	29-92) PS 29.85
AQ.	2 /					24.82

= <u>1935</u> Ft./Min.

Pb	In.Hg	Pg	In.Hg.
Stack	Diameter	13	) "
Stack	Area		ft. <sup>2</sup>
Stack	Gas Tempe	erature <u>'</u>	5 <u>60</u> °F

Pitot Tube I.D.

Tr	averse	
	Point	∆ P
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	
	26	
	27	
	28	
	29	
	30	
	_31	
	32	
	33	
	34	
	35	
	36	
	37	
	38	
	39	
	40	
	41	
	42	
)	43	
•	44	
	45	
	46	
	47	
		1

SHOLTES KOOGLER

1.



 $NO_X$ 

### EMISSION DATA

PLANT Regency
STACK Worthington #3

Run No.	<b>\$</b> 3	<b>\$</b> 3	#-3	#3
Date	12-13-83	12-13-83	12-13-83	12-13-83
Time	0855	0910	0925	0940
Flask No.	35	33	34	29
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	62 F	60F	62F	58 F
T <sub>f</sub> = Final Flask Temp., °F	71	70	71	. 71
Pi = Initial Flask Vacuum, "Hg	15.1+ 14.5	15.2+14.6	152+14.6	14.9+14.3
P <sub>f</sub> = Final Flask Vacuum, "Hg	7.2	+,3	.t.2	1.4
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf			man make you go .	
NO <sub>2</sub> Concentration, ppm	627.7	581.7	685,1	688.2

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{x}$ 

### EMISSION DATA

PLANT	Regency		
STACK	Worthington	#3	

Run No.	3	3	3	3
Date	12-13-83	12/13/83	17-13-83	12-13-83
Time	0955	09/010	1025	1040
Flask No.	36	26	31	30
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	2.5	2-5	25
Ti = Initial Flask Temp., °F -	62 F	LZF	66	62
T <sub>f</sub> = Final Flask Temp., °F	70	70	71	71
Pi = Initial Flask Vacuum, "Hg 5	-,1	+,2	٥	1,2
P <sub>f</sub> = Final Flask Vacuum, "Hg	15.2+14.6	15,2+14,6	15.2 + 14,6	15-2+14.6
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	577.9	570.8	679.2	580,3

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} & P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
) x 10<sup>-5</sup>

$$NO_2$$
 (ppm) = 8.406 x  $10^6$  x  $\frac{1bs}{ft^3}$   $NO_2$ 



 $NO_{x}$ 

### **EMISSION DATA**

PLANT	. Regency	
STACK	Worthington #3	

*3	#3	<b>43</b>	
12-13-83	12-13-83	12-13-83	
1100	1120	1140	
28	25	27	
			·
25	1-5	is	
64	67	67	
71	71	72	1
15.7+N.L	15.2 + 14.6	15.2+14.6	
1	1	-,2	
			,
585.9	572.3	685,6	
	12-13-83 1100 28 25 64 71 15.2+14.6	12-13-83 1100 1120 28 25 25 25 67 71 71 15.2+14.6 1	12-13-83 12-13-83 1100 1120 1140 28 25 27 25 25 25 67 67 71 71 72 15.2+14.6 15.2+14.6 112

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

Emission Calculations

Engine No #4 worth. Ts= 914 .F 0 = 3585 fpm

As = 1.766 ft2 NOx = 644 ppm Mol Wt = 30

Qs = 0 As = 3585 × 1.766 = 6331 ACFM

Qqp= Qs( 530) × 0.02832 =

42.382 100 SHEETS 5 SQUARE 42.389 200 SHEETS 5 SQUARE

= 6331 ACFM X 15.01 = 69.16 Etd meter?

8m/min NOx = ppm x M 0.102445 xastp

= 644 x1227 x 69,16 x10-6

= <u>54.68</u> gm/min

= 54.68 8 × 60 = 7.23 lb/hr.

Plant	Regenex
Date	12-13-83
Stack	# 4 Worthington
	•

Test Conducted By: RP

Traverse Point	ΔΡ
	,40 ,46 ,46 ,45
2	146
3	046
1 2 3 4 5 6 7	145
5	
6	735
7	,44
-8	.47
9	,47
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
19 20 21 22 23 24	
22	
23	
24	

VELOCITY	MEAS	UREMENT
FIELD I	DATA	SHEET

Stack	Configurat	ion

Ave	rage √∆P	= 0.661		41
.8'	4	<del></del>		42
II = (174) (CP)	$)$ ( $\sqrt{\Delta P}$ ) (	/+S+460	x 29-92)	43
! (17.1) (3.	, ( 45, , (	$\sqrt{\frac{1000}{\text{GS}}}$	$\frac{1}{PS}$	44
1		<b>V</b> 43	29.85	45
= 3585	Ft./Min.		•	46
				47
				48

РЬ	In.Hg	Ps	_In.Hg.
Stack	Diameter	18	
Stack	Area		ft. <sup>2</sup>
Stack	Gas Tempe	erature	914°F
Pitot	Tube I.D.		

	•	
Tr	averse	
L_	Point	ΔΡ
	25	
	26	
	27	
	28	
	25 26 27 28 29 30 31 32 33 34 35 36 37 38	
	30	
	31	
	32	
	33	
	34	
	35	
	36	
	37	
	38	
	39	
	40	
	41	
	40 41 42 43 44 45	
2)	43	
	44	
•	45	

SHOLTES KNOOGLER



 $NO_{x}$ 

### EMISSION DATA

PLANT	Regency	
STACK	#4 Worthington	

Run No.	#1	44	<b>#</b> 4	# y
Date	12-13-83	12-13-83	12-13-83	12-13-83
Time	1335	# (350	1405	1420
Flask No.	45	38	39	44
V <sub>f</sub> = Flask + Valve Volume, ml	,			
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	2.5
Ti = Initial Flask Temp., °F	72 F	73F	79F	8/F
T <sub>f</sub> = Final Flask Temp., °F	70	70	70	.71
P <sub>i</sub> = Initial Flask Vacuum, "Hg -	28.6	28.6	28.6	28.6
P <sub>f</sub> = Final Flask Vacuum, "Hg	-1.3	1	-1.0	-1.1
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, บg				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	712.2	452.7	847.8	779.9

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times [\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}], \text{ when } P_{bf} \& P_{bi} =$$

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{x}$ 

### EMISSION DATA

PLANT Regene x

STACK Worthington #4

A			
at Y	#4	HY	#4
12-13-83	12/13/83	12-13-83	12-13-89
1435	1450	1505	1520
42	43	40	37
25	25	25	25
84F	83F	82F	83F
71	71	70	.70
28.6	14.7+14.1	28.6	28.7
-1.3	-1,4	1	-1.4
		,	
	·		
67911	789.9	533.4	562.1
	12-13-83 1435 42 25 84F 71 38.6 -1.3	12-13-83 1435 1450 42 43 25 84F 71 71 71 38.6 14.7+14.1 -1.3 -1.4	12-13-83 12/13/83 12-13-83 1435 1450 1505 42 43 40 25 25 25 84F 83F 82F 71 71 70 38.6 14.7+14.1 28.6 -1.3 -1.41

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x( m ) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{X}$ 

### EMISSION DATA

PLANT	Regency	
STACK	Warthington #4	
-		

Run No.	#4	<b>&amp;</b> 4	#4	#4
Date	12-13-83	12-13-83	12-13-83	12-13-83
Time	1235	1250	1305	1320
Flask No.	23	14	20	3
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	2-5	2-5	25
Ti = Initial Flask Temp., °F -	65F	65F	72F	72F
T <sub>f</sub> = Final Flask Temp., °F	70	70	70	.70
Pi = Initial Flask Vacuum, "Hg —	14.8+14.2	14.8+14.2	28:6	28,6
P <sub>f</sub> = Final Flask Vacuum, "Hg	0	1	1	-0,4
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, սց				
NO <sub>2</sub> Concentration, 1bs/scf				
NO <sub>2</sub> Concentration, ppm	568.3	518.8	666.9	620.9

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

### Emission Glaulations

Engine No#6 Worth. Ts= 480 . F = 2793 fpm

As = 3.14 ft2 NOx = 1112 ppm Mol Wt = 30

Qs = UAs = 2793 × 3.14 = 8770 ACFM

Qqp= Qs( 530) x 0.02832 =

= 8770 ACFM X 15.01 = 140.0 std meter

3m/min NOx = ppm x M 0 102445 x astp

= 1112 x1227x 140.0 x10-6

= 19/ 8m/min

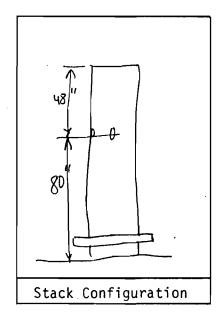
= 19/8 him x60 = 25,2 lb/hr.

Stack #6 Worthington

Test Conducted By: **TSS**RP

Traverse Point	ΔΡ
101110	
1	<u>,</u> 54
2	,54
3	.57
4	-35
5	.51
6	,48
1 2 3 4 5 6 7 8 9	148
8	, 47
9	,51
10	.54
11	,57
12	.58
13	162
14	.65
15	164
14 15 16	.65 .64
17	
18	
19	
20	
21	
20 21 22 23 24	
23	
24	

VELOCITY	MEAS	UREMENT
FIELD	DATA	SHEET



		Avera	ag <u>e</u>	$\sqrt{\Delta}$	P	=	0.623		
U =	(174)	(CP)	(	VΔP	) (	J	+S+460 GS	х	29-92) PS 29.70
=	27	93		Ft./M	in.				24.7

Pb	In.Hg	Ps		In.Hg.
Stack	Diameter		24	
Stack	Area			ft. <sup>2</sup>
Stack	Gas Temp	erat	ure L	80°F
Pitot	Tube I.D			

	•	
Tr	averse	
L	Point	ΔP
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	.19
	26	, 19
	27	.21
	28	.21
	29	126
	30	,24
	31	:27
	32	126
	33	, 27
	34	.26
	35	.26
	36	120
	37	.27
	38	,27
	39	٠28
	40	.28
	41	
	42	
32)	43	
<u>92)</u> o	44	
0	45	
	46	
	47	
	48	

### **BEST AVAILABLE COPY**



**TABLE** 

 $NO_{x}$ 

### EMISSION DATA

PLANT	
STACK	<del></del>

Run No.	4	<u>(</u> -	(,)	
Date	0 15/33	12-1-	12 - 15	
Time	097	011.	0930	
Flask No.	146.	41	3	<u> </u>
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	45	25	25	
Ti = Initial Flask Temp., °F	5.6	بي ش	57	
T <sub>f</sub> = Final Flask Temp., °F	65	65	71	. 69
Pi = Initial Flask Vacuum, "Hg	15.2+14.6	15/200 proc	15,2 + 14,6	,
P <sub>f</sub> = Final Flask Vacuum, "Hg	-,5	-1,0	-,3	0
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				·
NO <sub>2</sub> Concentration, 1bs/scf			- 4x - cm	:
NO <sub>2</sub> Concentration, ppm	688.9	686.6	1365.5	1358.7

\*Dry, 70°F, 29.92"Hg

PBF = 30,09. 12/16

 $V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$ , when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

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TABLE

 $N0_{x}$ 

### EMISSION DATA

PLANT			
STACK	 1 1 1	,	, ·

Run No.				a.*
Date	111/2	12/1	1/10	
Time	12:0	1515	11:3	
Flask No.	and the	35	22	
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl		: '		
Ti = Initial Flask Temp., °F	#	(-5T	5	
T <sub>f</sub> = Final Flask Temp., °F	68	69	67	68
Pi = Initial Flask Vacuum, "Hg	11.	15,74 14,4	57-22	1- 1- 3
P <sub>f</sub> = Final Flask Vacuum, "Hg	D	0 *	-0.5	-1.0
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf		_	- 1907 N = 1900	£
.NO <sub>2</sub> Concentration, ppm	926.1	1066.6	#1244.9	1099.7

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x 
$$\frac{1bs}{ft^3}$$
 NO<sub>2</sub>

### **Best Available Copy**



**TABLE** 

 $NO_{\mathbf{X}}$ 

### **EMISSION DATA**

PLANT	Rencie	
STACK_	the White de	,

Run No.	6	( )	(	(c
Date	12/15	12/6/2	10.	12/5/2
Time	1100	1115	1130	1146
Flask No.	19	17	4	15
V <sub>f</sub> = Flask + Valve Volume, ml	,			
V <sub>a</sub> = Absorbing Soln. Volume, vl	20	225	arrial and	4.
Ti = Initial Flask Temp., °F	4ct	605	COF	60F
T <sub>f</sub> = Final Flask Temp., °F	66	66	69	. 69
P <sub>i</sub> = Initial Flask Vacuum, "Hg	15,14 14.5	15,2+14,6	15,1414,5	15,1+14,5
P <sub>f</sub> = Final Flask Vacuum, "Hg	-1,0	-0.8	- , Z,	0
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, 1bs/scf				
NO <sub>2</sub> Concentration, ppm	1147.7	1185.6	1297.6	1274.1

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(m) x 10<sup>-5</sup>  

$$V_{\text{stpd}}$$
  
 $V_{\text{stpd}}$   
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1\text{bs}}{\text{ft}^3}$  NO<sub>2</sub>

Emission Calculations

Engine No #3 Cot Ts= 493 . F = 3569 fpm

As = 0.417 ftz  $NO_X = 194$  ppm Mol Wt = 30

Qs = UAs = 3569 × 0.417 = 1488 ACFM

Qqp= Qs( 530) × 0.02832 =

= 1488 ACFM X 15.01 = 23,44 std meter

3m/min NOx = ppm x M 0 102/4/5 x astp

= 194 x1227 x 23.44 x10-6

= <u>5.58</u> gm/min

= - 8-hin x60 = 0.74 lb/hr.

# SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS GAINESVILLE, FLORIDA (904) 377-5822

VELOCITY MEASUREMENT FIELD DATA SHEET

Plant	Re	gency	
Date	,	3-83	
Stack	#3	Cat	
Test Cond	ucted By:	RSS	
		RP	

Traverse Point	ΛP
101110	<del></del>
1	ΔP ,60 ,60 ,60
2	160 1
3	1,60
4	160
5	
2 3 4 5 6	161
7	-73
8	.68
8 9	.58
10	T
11	i – – – 1
12	
13	
14	i – – – –
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

SHOLTES KNOOGLER

,
Stack Configuration

			Avera	age	. 12	P	=	0.790		
U	=	(174)	(CP)	(	VΔP	) (		+S+460 GS	X	29-92) PS 29.85
=	_	35	69		Ft./M	in.				<b>⊘</b> 11-7

РЬ	In.Hg Ps _	In.Hg.
Stack	Diameter	834"
Stack	Area	ft. <sup>2</sup>
Stack	Gas Temperatu	ire <u>493</u> °F
Pitot	Tube I.D.	

Tr	averse Point	ΔP
	26	
	27	
	28	
	29	
	30	
	31	
	32	
	33	_
	34	
	35	
	36	
	37	
	38	
	39	
	40	
	41	
	42	
2)	43	
<u>2)</u>	44	
)	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	
	46	
	47	
	48	

X

. TABLE

 $NO_{\mathbf{x}}$ 

### EMISSION DATA

PLANT_	Regency	
STACK	#3 Cat	

			<del></del>
3 Cat	3 (24	3Cat	3 (24
12-13-83	12-13-83	12-13-83	12-13-83
1330	1345	1400	1415
15	17	4	19
•			
25	25	<b>3</b> _5	25
58F	59 F	60F	58F
70	70	71	. 69
28.5	28.4	28.5	28.5
+,2	+.1	+.1	+,1
an and military and a second	ť		
·			
209.4	141.7	203.7	190.9
	12-13-83 1330 15 25 58F 70 28.5 +,2	12-13-83 12-13-83 1330 1345 15 17 25 25 58F 59F 70 70 28.5 28.4 +,2 +.1	12-13-83 12-13-83 12-13-83 1330 1345 1400 15 17 4 25 25 25 58F 59F 60F 70 70 71 28.5 28.4 28.5 +,2 +,1 +,1

\*Dry, 70°F, 29.92"Hg

$$V_{\text{stpd}} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right], \text{ when } P_{bf} \& P_{bi} =$$

$$NO_2$$
 (lbs/scf) = 6.243 x(m) x 10-5

$$NO_2$$
 (ppm) = 8.406 x  $10^6$  x  $\frac{1bs}{ft^3}$   $NO_2$ 

 $NO_{x}$ 

#### **EMISSION DATA**

PLANT_	Regency	
STACK	# 3 Cat	_

3 Cart	3 (74	3 (4	3 Cart
12-13-83	12-13-83	12-13-83	12-13-83
1430	1445	1500	1515
13	16	41	46
	_	_	
25	25 '	25	25
58 F	57 F	58 F	58F
70	71	70	. 70
27.5	28.2	28.4	28,2
+,3	+,4	<b>+,4</b> .	+,3
		į	
221.1	178.7	185.7	189.8
	12-13-83 1430 13 25 58 F 70 27.5 +,3	12-13-87 12-13-83 1430 1445 13 16 25 25' 58F 57F 70 71 27.5 28.2 +,3 +.4	12-13-83 12-13-83 1430 1445 1500 13 16 41 25 25 25 58F 57F 58F 70 71 70 27.5 28.2 28.4 +,3 +.4 +,4.

\*Dry, 70°F, 29.92"Hg

PBF = 29.68 12/14

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} = ...$ 

the final and initial barometric pressures.

NO<sub>2</sub> (lbs/scf) = 6.243 x(
$$\frac{m}{V}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

199.7

SHATES KNOOTHER

### Emission Calculations

Engine No 10 cat  $T_{S} = 516 \cdot F$   $U = 3439 \cdot fpm$ As = 0.417 ftz No<sub>x</sub> = 223 ppm

Mol Wt = 30

 $Q_{S} = \overline{Q} A_{S} = \underline{3439} \times \underline{0.417} = \underline{1434} \quad ACFM$   $Q_{S} = \overline{Q}_{S} \left( \frac{530}{T_{S} + 1060} \right) \times 0.02832 =$   $= \underline{\frac{1434}{516 + 460}} \quad ACFM \times 15.01 = \underline{30.05} \times 10^{-10} \times \frac{100}{100} \times \frac{$ 

Stack #10 Gt

Test Conducted By: 1255

 _	RP

Traverse Point	ΔΡ
1	.56 250
2	256
	156
4 5 6 7	155
5	
6	+57
	.58 .56
8 9	.58
9	.56
10	
11	-
12	
13	
14	
15	
16	
17	
18	
19	
20 21	
21	
22	
23_	
24	

<b>VELOCITY</b>	MEAS	UREMENT
FIELD I	DATA	SHEET

·
Stack Configuration

Average 
$$\sqrt{\Delta P} = 0.753$$
  
 $J = (174) (CP) (\sqrt{\Delta P}) (\sqrt{\frac{+S+460}{GS}} \times \frac{29-92}{PS}$ 

=	3439	Ft./Min.
---	------	----------

РЬ	In.Hg	Ps	_In.Hg.
Stack	Diameter	83/	4"
Stack	Area	0.417	ft. <sup>2</sup>
Stack	Gas Temp	erature	<u>516</u> °F
Pitot	Tube I.D	)	

Tr	averse Point	ΔP
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44	
	26	
	27	
	28	
	29	
	30	
	31	
	32	
	33	
	34	
	35	
	36	_
	37	
	38	
	39	
	40	
	41	
	42	
2)	43	
_,	44	
	45 46 47	
	46	
	47	
	48	

SHOLTES KNOOGLER



 $NO_{X}$ 

### EMISSION DATA

PLANT	Resency	
STACK	\$ 10 Cat.	

10 Cut	(0 Cat.	10 (24.	10(14.
(2-15-83	12/15/83	12/15/83	12/15/83
1305	1320	1335	1350
30	28	25	39
25	JS	25	25
609F	60F	62 F	60F
bb	66	67	.67
15.2+14.6	15,1+14.5	15.1+14.5	15.1+14.5
8.0-	-0.5	-016	-1.0
17.9	201.1	169.8	244,2
	12-15-83 1305 30 25 609= 66 15.2+14.6 -0.8	12-15-83 12/15/83 1305 1320 30 28 25 25 609= 60F 66 15.2+14.6 15.1+14.5 -0.6 -0.5	12-15-83 12/15/83 12/15/83 1305 1320 1335 30 28 25 25 25 609= 60F 62F 66 67 15.2+14.6 15.1+14.5 15.1+14.5 -0.8 -0.5 -0.6

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{lbs}{ft^3}$  NO<sub>2</sub>

### **BEST AVAILABLE COPY**

X

TABLE

 $N0_{x}$ 

#### **EMISSION DATA**

PLANT\_\_\_\_\_\_STACK\_\_\_\_\_\_

Run No.	\$10°CH	#1004	*10 C14	#10 Cut
Date	(2/15/83	12/15/83	12/15/83	12/15/83
Time	1405	1420	1435	1450
Flask No.	26	36	33	31
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	2-5	25	25
Ti = Initial Flask Temp., °F -	58 F	62 F	61F	60F
T <sub>f</sub> = Final Flask Temp., °F	66	67	66	.66
Pi = Initial Flask Vacuum, "Hg	15.1+14.5	15,1+14.5	15.1+14.5	15,1+14,5
P <sub>f</sub> = Final Flask Vacuum, "Hg	-0,G	-0.8	-0.7	-1.0
V <sub>stpd</sub> = Gas Sample Volume, ml*	_			
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf		William Company		
NO <sub>2</sub> Concentration, ppm	226.2	185.4	248.2	238.9

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{X}$ 

### **EMISSION DATA**

PLANT	Regen	ζy	
STACK	\$ 10	Cat	

*	<del>,</del>	· · · · · · · · · · · · · · · · · · ·	<del></del>	
Run No.	\$10 64	\$10 CI+	\$1064	#10(4+,
Date	12/8/83	12/15/83	12/15/83	12/15/83
Time	1505	1520	1535	1550
Flask No.	34	35	32	29
$V_f$ = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	J-5	25
Ti = Initial Flask Temp., °F	60 F	62F	63F	67 F
T <sub>f</sub> = Final Flask Temp., °F	65	66	66	.66
Pi = Initial Flask Vacuum, "Hg	15.1+24.5	15.1+14.5	15.1+14.5	15,1+14,5
P <sub>f</sub> = Final Flask Vacuum, "Hg	-0,5	-0.5	-0.4	-0,5
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	224.2	432.5	230.3	247.0

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

 $\begin{picture}(100,0) \put(0,0){\line(0,0){100}} \put(0,0){\line(0,0){10$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(
$$\frac{m}{v_{stpd}}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

Emission Calculations

Engine No 11 Cat Ts = 525 . F 0 = 4060 fpm

 $A_{s} = 0.417$  ft<sup>2</sup>  $No_{x} = 163$  ppm Mol Wt = 30

Qs = UAs = 4060 KO.417 = 1693 ACFM

Qqp= Qs( 530) × 0.02832 =

= 1693 ACFM X 15.01 = 25.80 Etd meter?

3m/min NOx = ppm x M 0.02.445 x astp

= 163 x1227 x 25.80 x10-6

= 5.17 8m/min

= 5.17 8 km x60 = 0.68 lb/hr.

Plant	Regency	
Date	12-13-83	
	<b>A</b> 11 (. L	

Test Conducted By: TSS

RP

Traverse Point	ΔΡ
1	.79
2	186
3	,14
3 4 5 6	.72
_5	
6	078
7	. 87
8	.79
9	-71
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	

VELOCITY	MEAS	SUREMENT
FIELD	DATA	SHEET

,		
Stack	Configuration	

	Averag	e VAP	= 0,884		
U = (174)	(CP) (	√ <u>AP</u> )	$(\sqrt{\frac{+S+460}{GS}})$	X	29-92)
= 406		_Ft./Min.			29.85

РЬ	In.Hg	Ps	In.Hg.
Stack	Diameter		83/4"

Stack Area \_\_\_\_\_ft.

Stack Gas Temperature 525°F

Pitot Tube I.D.

	•	
Tr	averse Point	ΔP
	25	
	26	
	27	
	25 26 27 28 29 30	
	29	
	30	
	31 32 33 34 35 36 37 38 39 40 41 42 43	
	32	
	33	
	34	
	35	
	36	
	37 -	
	38	
	39	
	40	
	41	
	42	
2)	43	
	44	
	45	
	46	

SHOLTES KNOOGLER



 $NO_{X}$ 

### EMISSION DATA

PLANT Regency
STACK # 11 Cat

#11	#11	# (1	#11
12-13-83	12-13-83	12-13-83	12-13-83
0950	1005	1020	1235
Z	6	7	8
25	25	<u> </u>	25
54F	55F	54F	53F
71	72	70	.71
28.2	28.5	28,2	28.5
+,7	+,5	+.5	+.6
			amen'ny piesa na 19 piny na
	į		`
149,1	\$154,0	238,2	138.7
	12-13-83 0950 2 25 54F 71 28.2 +,7	12-13-83 12-13-83 12-13-83 1005 2 6 25 25 25 25 25 25 71 72 28.2 28.5 +,7 +,5	12-13-83 0950 1005 1020 2 6 7 25 54F 51F 71 72 70 28.2 28.5 4.7 12-13-83 12-13-83 1820 7 7 7 7 7 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820 1820

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right], \text{ when } P_{bf} \& P_{bi} = \frac{Pbi - Pi}{Ti}$$

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  

$$V_{stpd}$$
  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_X$ 

### **EMISSION DATA**

PLANT	Re gevey,	
STACK	生(1 6)十	

			<del></del>	
Run No.	#11	#11	#11	JE 11
Date	12-13-83	12-13-83	12-13-83	(2-13-83
Time	0850	0905	0920	0935
Flask No.	11	10	32	5
V <sub>f</sub> ≈ Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	57 F	55 F	53F	55
T <sub>f</sub> = Final Flask Temp., °F	71	71	70	71
P <sub>i</sub> = Initial Flask Vacuum, "Hg	27,2	27,7	28.2	28,0
P <sub>f</sub> = Final Flask Vacuum, "Hg	+,2	4,5	1	+,4
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug			,	
NO <sub>2</sub> Concentration, lbs/scf		à		
NO <sub>2</sub> Concentration, ppm	213.5	158.1	120,1	127.1

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

X

### TABLE '

 $NO_{\mathbf{X}}$  ,

### **EMISSION DATA**

PLANT	Regenex	:	
STACK	# 11 (at		

		1		
Run No.	l (	( )	(I	
Date	12-13-83	12-13-83	12-13-83	
Time	1055	1115	1135	
Flask No.	9	12		
V <sub>f</sub> = Flask + Valve Volume, ml				·
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	
Ti = Initial Flask Temp., °F	55 F	54F	55F	·
T <sub>f</sub> = Final Flask Temp., °F	71	71	. 70	•
Pi = Initial Flask Vacuum, "Hg -	28.0	28.5	28.3	
P <sub>f</sub> = Final Flask Vacuum, "Hg	+,5	+,7	1	
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, 1bs/scf			•	
NO <sub>2</sub> Concentration, ppm	124.9	197.6	176,5	

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

### Emission Calculations

Engine No JA Ts= 332 . F = 712 fpm

 $As = 0.417 \text{ ft}^2$   $NO_X = 213 \text{ ppm}$ Mol Wt = 30

 $Q_{S} = \overline{U} A_{S} = \underline{712} \times 0.417 = \underline{297} \quad ACFM$   $Q_{S} = Q_{S} \left( \frac{530}{T_{S} + 460} \right) \times 0.02832 =$   $= \underline{297} \quad ACFM \times 15.01 = \underline{5.63} \quad \text{and} \quad \text{meter}^{3}$ 

3m/min NOx = ppm x M 0.02445 xastp

= 213 x1227x 5,63 x10-6

= 1,47 8m/min

= 1.47 8 × 60 = 0.19 lb/hr.

## SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS GAINESVILLE, FLORIDA (904) 377-5822

**VELOCITY MEASUREMENT** 

FIELD DATA SHEET

P1ant	Regency	V.
Date _	12-15-83	

Stack JA

Test Conducted By: TSC

Traverse Point	ΔΡ
	.03
1 2 3 4 5 6 7 8 9	107
3	· D3
4	103
5	
6	103
7	(0)
8	·03
9	103
10	
11	
12	
13	
14	
15	
16	
17	
18	·
1.9	
20	
21	
22	
23	
2/	

SHOLIES KNOOGLER

Stack Configuration	_

РЬ	In.Hg	Ps	_In.Hg.
Stack	Diameter	-37	, "
Stack	Area		ft. <sup>2</sup>
Stack	Gas Temp	erature	<u>332</u> °F
Pitot	Tube I.D	•	

Tr	averse Point	ΔP
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	
	42	
2)	43	
_^ )	44	
•	45	

46 47 48

Average  $\sqrt{\Delta P} = 0.173$  $0 = (174) (CP) (\sqrt{\Delta P}) (\sqrt{\frac{+S+460}{GS}} \times \frac{29-92}{P_{A}^{S}})$ 

= <u>112</u> Ft./Min.



 $N0_{x}$ 

### **EMISSION DATA**

PLANT	Regency	
STACK	JA Cat (Chiller)	•

				_
Run No.	AL	AU	JA	JA
Date	12/15/83	12/15/83	12/15/83	12/15/83
Time	1500	1515	1530	1545
Flask No.	13	14	16	13
V <sub>f</sub> = Flask + Valve Volume, ml			,	
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	2.5	2-5	2-5
Ti = Initial Flask Temp., °F -	68F	63 F	69F	67 =
T <sub>f</sub> = Final Flask Temp., °F	65	67	71	.72
Pi = Initial Flask Vacuum, "Hg —	27.8	28.0	28.0	28,0
P <sub>f</sub> = Final Flask Vacuum, "Hg	6	0	7,5	5
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, บg				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	200.9	178.1	214.6	212.1

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>



 $NO_{\mathbf{X}}$ 

### **EMISSION DATA**

PLANT Regency
STACK JA Cat. (Chiller)

Run No.	AL	JA	JA	JA
Date	12/15/83	12/15/83	12/15/83	12/15/83
Time	1400	1415	1430	1445
Flask No.	24	10	20	12
$V_f$ = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	2.5	25
Ti = Initial Flask Temp., °F	62 F	63 F	66F	67F
T <sub>f</sub> = Final Flask Temp., °F	67	67	69-	650
P; = Initial Flask Vacuum, "Hg	27.3	27.3	27.5	27.6
P <sub>f</sub> = Final Flask Vacuum, "Hg	- ,-	0	-,5	4
V <sub>stpd</sub> = Gas Sample Volume, ml*	-			
m = Mass of NO2 in Gas Sample, บg				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	194.1	186.5	250.0	167.0

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} & P_{bi} =$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x(m) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

X

TABLE

 $NO_{\mathbf{x}}$ 

### EMISSION DATA

PLANT	Regency	
STACK	JA Cat (Chiller)	·

Run No.	_ J A	JA	JA	AL
Date	12/15/83	12/15/83	12/15/83	12/15/83
Time	1300	1315	1330	(345
Flask No.	42	27	21	5
V <sub>f</sub> = Flask + Valve Volume, ml				_
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	63 F	64 F	62F	62F
T <sub>f</sub> = Final Flask Temp., °F	68	67	66	164
P <sub>i</sub> = Initial Flask Vacuum, "Hg	28.2	28,2	28,0	27.7
P <sub>f</sub> = Final Flask Vacuum, "Hg	-0.	- D, \	-,4	-,4
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, ug				
NO <sub>2</sub> Concentration, lbs/scf				
NO <sub>2</sub> Concentration, ppm	258,8	229.1	251.9	207.8

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} = \frac{Pbi - Pi}{Ti}$ 

NO<sub>2</sub> (lbs/scf) = 6.243 x( m ) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 
$$10^6$$
 x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

Emission Glaulations

Engine No JB TS= 357 . F 0 = 2397 fpm

As = 0.417 ftz Nox = 344 ppm

Mol Wt = 30

Qs = UAs = 2397 × 0.417 = 999.5

Qqp = Qs ( 530 ) x 0. 02832 =

= 999.5 ACFM X 15.01 = 18.36 = 1d meter

3m/min NOx = ppm x M 0 102/415 x QSHp

= 344 x1227x 18.36 x10-6

= 7.76 gm/min

= 7.76 8 him x60 = 1.03 lb/hr.

# SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS GAINESVILLE, FLORIDA (904) 377-5822

Plant Regerry
Date (2-2-83

Stack \_ & B chuller

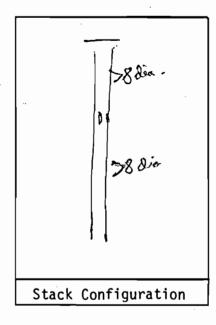
Test Conducted By: \( \tag{85}

RP

Traverse Point	ΔΡ
1	.33
2	732
. 3	.32
4	•33
5 6 7	
6	133
	, 33
8	.34
8 9 10	133
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

SHOLTES KOOGLER

VELOCITY MEASUREMENT FIELD DATA SHEET



Pb \_\_\_In.Hg Pg \_\_\_In.Hg.

Stack Diameter \_\_\_\_8.75 ''

Stack Area \_\_\_\_\_ft.<sup>2</sup>

Stack Gas Temperature \_\_\_\_357 °F

Pitot Tube I.D.

	•	
Tr	averse Point	ΔP
	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	
	38 39	
	40	
2)	43	
,	45	

48

Average  $\sqrt{\Delta P} = 0.573$  $U = (174) (CP) (\sqrt{\Delta P}) (\sqrt{\frac{+S+460}{GS}} \times \frac{29-92}{PS})$ 

= <u>2397</u> Ft./Min

ç.



#### **TABLE**

 $NO_{x}$ 

#### **EMISSION DATA**

PLANT	Regency	
STACK	JB Chiller Cat	

JB	JB	\ 0	
	777	JB	JB
12-12-83	12/12/83	12-12-83	12-12-83
1335	1350	1405	1420
37	40	38	42
25	25	25	25
78 F	75 F	78F	77F
71	*	69	. 70
27.8	28.2	28,2	27.8
-1.8	*	-1,5	-1,7
		iz .	2
340.6	\$ 294.7	303.6	292.3
	1335 37 25 78 F 71 27.8 -1.8	1335 37 40 25 78 F 71 * 27.8 28.2 -1.8 *	1335 37 40 38 38 35 25 25 78F 71 * 69 27.8 28.2 28.2 -1.5

\*Dry, 70°F, 29.92"Hg

(\* 2. way value)

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} & P_{bi} =$ 

the final and initial barometric pressures.

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

$$NO_2$$
 (ppm) = 8.406 x  $10^6$  x  $\frac{1bs}{ft^3}$   $NO_2$ 



#### **TABLE**

 $NO_{x}$ 

#### EMISSION DATA

PLANT	75	egency		
STACK	JB	Chiller	Cat	·

Run No.	78	B	JB	13
Date	12-12-83	12-12-83	12-12-83	12-12-83
Time	1235	1250	1305	1320
Flask No.	45	43	41	39
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	70 F	79F	75 F	73F
T <sub>f</sub> = Final Flask Temp., °F	68F	68	70	.71
Pi = Initial Flask Vacuum, "Hg	27,3	27.5	28.2	28,2
P <sub>f</sub> = Final Flask Vacuum, "Hg	-1.2	-1.6	-0,/	-1.4
V <sub>Stpd</sub> = Gas Sample Volume, ml*				
-m = Mass of NO2 in Gas Sample, µg				
NO <sub>2</sub> Concentration, lbs/scf	,	i.	,	'yak puliku 🧓 yaken
NO <sub>2</sub> Concentration, ppm	314.1	332.4	288.1	335.8

\*Dry, 70°F, 29.92"Hg

$$V_{stpd} = 17.64 \times (V_f - V_a) \times \left[\frac{Pbf - Pf}{Tf} - \frac{Pbi - Pi}{Ti}\right]$$
, when  $P_{bf} \& P_{bi} =$ 

the final and initial barometric pressures.

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
) x 10<sup>-5</sup>  
NO<sub>2</sub> (ppm) = 8.406 x 10<sup>6</sup> x  $\frac{1bs}{ft^3}$  NO<sub>2</sub>

$$NO_2$$
 (ppm) = 8.406 x  $10^6$  x  $\frac{1bs}{ft^3}$   $NO_2$ 



TABLE

NO<sub>x</sub>

#### EMISSION DATA

PLANT Regency
STACK JB Chiller Cut

Run No.	JB	JB	JB	JB
Date	12-12-83	12-12-83	12-12-83	12-12-83
Time	1135	1150	1205	1220
Flask No.	.16	44	13	14
V <sub>f</sub> = Flask + Valve Volume, ml				
V <sub>a</sub> = Absorbing Soln. Volume, vl	25	25	25	25
Ti = Initial Flask Temp., °F	65F	67F	65F	65F
T <sub>f</sub> = Final Flask Temp., °F	67	69	67	.67
Pi = Initial Flask Vacuum,-"Hg	27.5	27.5	27.3	27.5
P <sub>f</sub> = Final Flask Vacuum, "Hg	/_	-0.6	1.	1
V <sub>stpd</sub> = Gas Sample Volume, ml*				
m = Mass of NO2 in Gas Sample, բց՝			4.	
NO <sub>2</sub> Concentration, lbs/scf		ì		
NO <sub>2</sub> Concentration, ppm	632.8	368.5	33/1	299.2

\*Dry, 70°F, 29.92"Hg

PBF . 29.85 .12/13

$$V_{\text{stpd}} = 17.64 \times (V_{\text{f}} - V_{\text{a}}) \times \left[\frac{\text{Pbf} - Pf}{\text{Tf}} - \frac{\text{Pbi-Pi}}{\text{Ti}}\right], \text{ when } P_{\text{bf}} \& P_{\text{bi}} =$$

the final and initial barometric pressures.

NO<sub>2</sub> (1bs/scf) = 6.243 x(
$$\frac{m}{V_{stpd}}$$
 x 10-5

 $NO_2$  (ppm) = 8.406 x  $10^6$  x  $\frac{1bs}{ft^3}$   $NO_2$ 

# Recapitulation of Roadings

Time	# 2 Worth	hington Gus	Total Gas Meter
11 37	950		720817
1215	950	25466	
1245		よ5452	
1250	930		7208.8
1333	930		7210.15
1400	940	25413	
1429	940		7213.3
1435	·	25393	

#### **BEST AVAILABLE COPY**

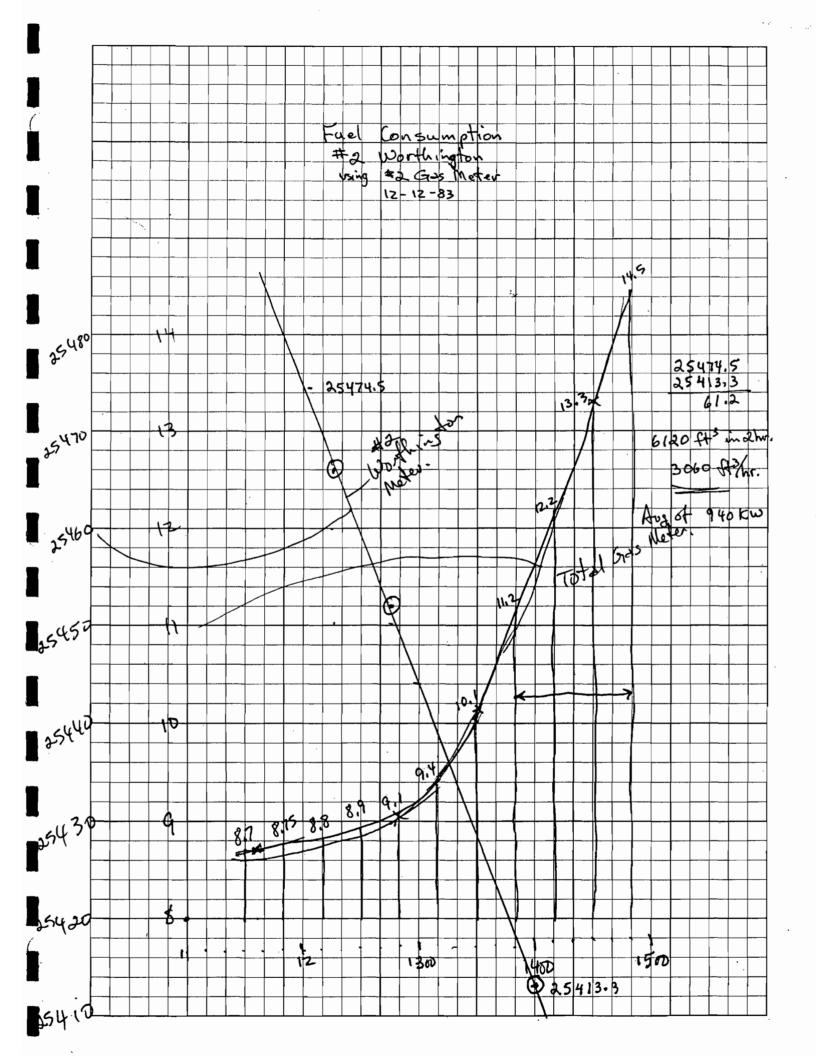
#2 95 KW 1215 2100 Ar #2 Sas Mt. 25466 1215 2-12-83 100 Ar JB 17836 1215

> #3 28452 1245 Vane 0.4 1245 on JB JB meter not working (245

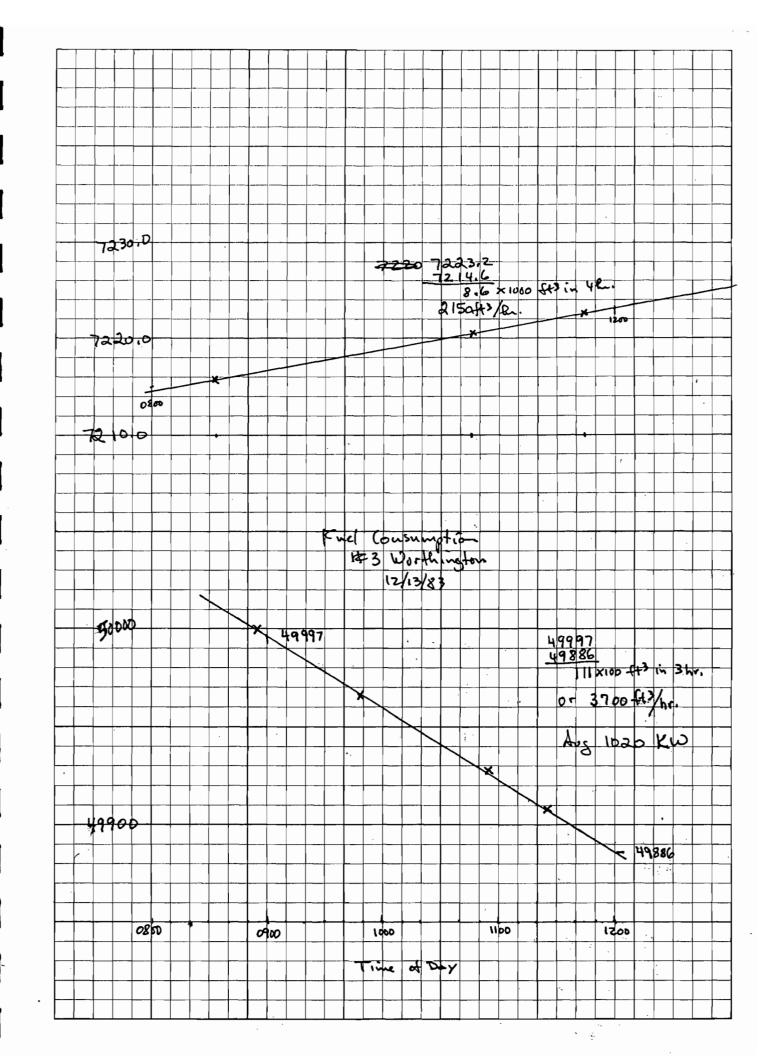
#3 25413 1400 #3 25413 1400

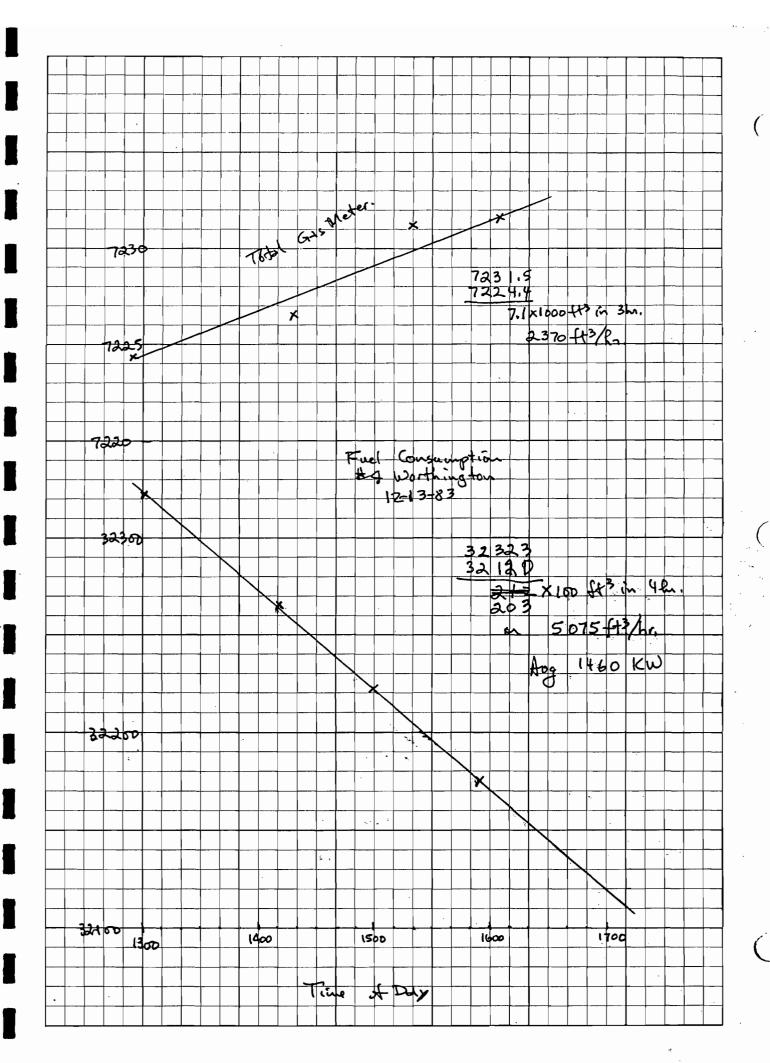
m35641 EBESB CX

17836 - 1140 (also 1126) fir gos metos to 11836-1254 Ida gas 7208.7-1/37 7208.8-1250 7210.15 1333 72/3.30 1429 #2 KW 925 - 1337 1255



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#4 Worth 1420KW 1554 #4 Worth 32175 1556

Hurs. #6

Total Gas Meter Corrected 00723124 Uncorrected 015465.0

Cat #3 420 AC Kilowatts - 1303 420-1412 Janh Zarm 722425-1255, 1226.50 - 1418 # 4 Clothington AC-Kilerwalls 1500-1309 32322 - 1304 32266 - 1411 1500 = 1410

Cleary Union digital
01576/1.1 @ 1510h

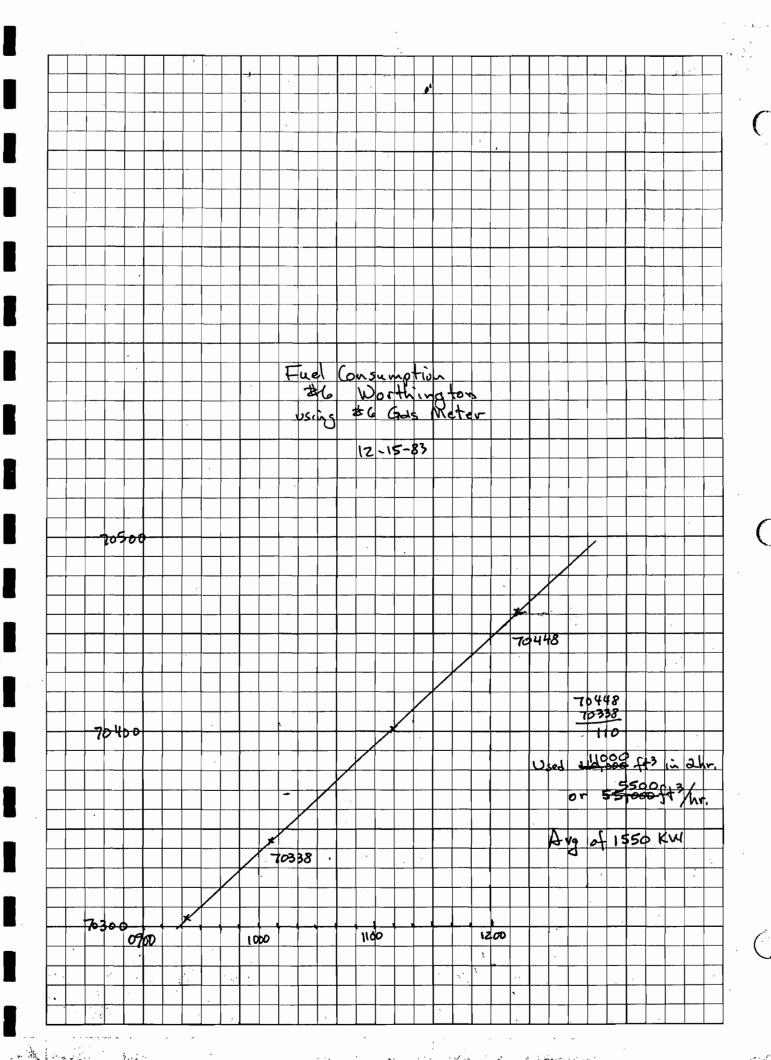
Regency Lquare 12-15 XW. #3 Worthengton 1100-0856 49999-0855 1020 -0950 49966 - 0948 AC- Kilowatts 400-0857. 420 -0950 Tank farm 7215,9-0833 7220.3-1046 722245 - 1144

Recapitulation of Realings 12-15-83

Time 0922 1007 1110 1214	\$6 Worthing \$	500 7030 Y 70344 70401 70461	Total Gus Meter  * Gas company had removed  gas mater
1230 1400 1453	#10 Cat 400 400 405		

400

1453 1522



Regency Square 12-15-83 #6 Full-Worthington 70304-0922 70344-1007 70461-1214

megawatts

1.5 - 0929 1.6 - 1000 1.55 - 1109 1.55 - 1213

#10 400KW-1230 405 KW-1400 405 KW-1453 400KW-1522

# 10 Amil A

737-6880

#### SAMPLE CHAIN OF CUSTODY

PLANT NAME:	Regency	Square		
PLANT NAME:	Engine ?	Exhaust		
DATE: 12/12-	15/83	TYPE OF SAMPLE:	Method 7	
		•		
	SAMPL	E RECOVERY		
CONTAINER NO.			DESCRIPTION	
12/12 Sumples.		Talean by	R.S. Sholk	5
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				<del> </del>
Sample Recovered	By: Tech		ilan Luther.	· · · · · · · · · · · · · · · · · · ·
NOx <del>Particulate</del> Anal	ysis By:			



DE PONDA

November 30, 1984

Florida Department of Environmental Regulation Mr. C. H. Fancy Deputy Bureau Chief 2600 Blair Stone Road Tallahassee, Florida 32301

Re: R.S. Properties Three (formerly Regency Square Properties) Modification to Permit AC16-60981

Dear Mr. Fancy:

Enclosed are five copies of a construction permit application addressing modifications to existing permit conditions for the R.S. Properties Three Total Energy Plant. Modifications were addressed in detail in a letter to you from Sholtes & Koogler, Environmental Consultants, dated June 29, 1984. The enclosed applications represent the information previously submitted to you by Sholtes & Koogler on DER Form 17-1.202(1).

In submitting the applications, R.S. Properties Three is unsure of the appropriate permit application fee. As previously stated, the enclosed permit applications address only modifications resulting in change in air pollutant emission rates. If the Department will advise us on the applications fee, the appropriate fee will be forwarded to your office.

During a recent discussion of the enclosed permit application with Sholtes & Koogler, your staff requested that the status of the retired electric power generating units be defined. Worthington Engine #1 is presently being cannibalized for parts and is in such a disassembled state it cannot ever be run. Worthington Engine #5 has fuel lines disconnected. Caterpillar Engines #1,8 and 9 have also been disassembled to a point where they cannot run.

Mr. C. H. Fancy page 2

If there are any questions regarding the enclosed permit applications or if additional information is required, please contact Dr. John B. Koogler at 904/377-5822.

Sincerely, REGENCY SQUARE SHOPPING CENTER

James W. H. Ridgely, Jr General Manager

JWHR/vjd

Enc.

cc: Sholtes & Koogler William Johnson

#### STATE OF FLORIDA

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

August 13, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Bill Johnson Regency Square Properties, Inc. Barnett Regency Tower Suite 1200 Jacksonville, Florida 32211

Dear Mr. Johnson:

Re: Request for Modifications for Air Pollution Sources in the Construction Permit No. AC 16-60981

The department is in receipt of John B. Koogler's letter in which several modifications were requested to the above referenced construction permit. Since there are net pollutant emission increases per source, which by definition constitute a modification, a formal request for modifications to air pollution sources will be required and to be submitted on an application, DER Form 17-1.202(1). A processing fee per source is required based on the net potential pollutant emissions increase, whichever is the largest per source, pursuant to Rule 17-4.05(4)(a). Upon receipt of the application and fee, a completeness review will be performed by the bureau.

If there are any questions, please call Bruce Mitchell at (904)488-1344 or write to me at the above address.

Simcerely

C. H. Fancy, P.E.

Deputy Chief

Bureau of Air Qua/lity

Management

CHF/BM/s

cc: Dr. J. Koogler

J. Woosley

D. Dutton

N. Wright

D. Thompson

PS Ferm	● SENDER: Complete items 1, 2, and 3. Add your address in the "RETURN TO" space on severse.	·i
3811, Jan. 1979	1.—The following service is requested (check one.)  Show to whom and date delivered	
	(CONSULT POSTMASTER FOR FEES)	.4
	2. ARTICLE ADDRESSED TO:	
ET	Mr. Bill Johnson	
JRN R	Barnett Regency Tower, Stel: Jacksonville, FL 32211	200
ECE	4. ARTICLE DESCRIPTION: REGISTERED NO.   CERTIFIED NO.   INSURED NO.	
RETURN RECEIPT, REGISTERED, INSURED	0156544	
3193	(Always obtain signature of addressee or agent)	
TEH	Thave received the article described above.  SIGNATURE DAddressee Clauthorized agent	
EO,	Signature DAddressee DAuthorized agent	
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F	₹7GPO - 1979-300-459	

No. 0156544

RECEIPT FOR CERTIFIED MAIL NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse) SENT TO Mr. Bill Johnson P.O., STATE AND ZIP CODE POSTAGE CERTIFIED FEE CONSULT POSTMASTER FOR FEES SPECIAL DELIVERY ¢ RESTRICTED DELIVERY ¢ OPTIONAL SERVICES
RETURN RECEIPT SERVICE SHOW TO WHOM AND DATE DELIVERED SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY ¢ SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY TOTAL POSTAGE AND FEES S POSTMARK OR DATE

8/14/84

PS Form 3800, Apr.

### DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES

Bio-Environmental Services Division Air and Water Pollution Control

August 9, 1984



Mr. Bruce Mitchell Central Air Permitting Section Florida Dept. of Environmental Regulation Twin Towers Office Building 2600 Blairstone Road Tallahassee, Florida 32301

DER AUG 1 0 1934

Dear Mr. Mitchell:

This letter is in response to Regency Square's request to modify their Air Pollution Source Construction Permit (A016-60981) by retiring Worthington units 1 and 5 and Caterpillar units 1, 8, and 9 and increasing usage in the remaining units. Bio-Environmental Services Division(BESD) has reviewed the requested modifications and offersthe following comments.

- 1) The requested decrease in diesel fuel usage from specific conditions A5a and A5b does not indicate if NOx emission offsets are sufficient to account for the increased NOx emissions from increased natural gas consumption as requested for modification under A5c and A5d.
- 2) Specific Condition B3 limits the Caterpillar to  $22.65~\rm X~10^6$  cubic feet/year of natural gas. Regency Square is asking to modify the permit to increase this amount to  $51.75~\rm X~10^6$  cubic feet/year. This request to increase NOx emissions on the Caterpillars from 0.2 to 1.1 pounds per hour will result in a substantial increase in annual emissions and would be a modification to permit conditions.
- 3) The applicant,upon requesting an increase in hourly emissions for the Caterpillar units has not shown sufficient evidence to support the need to increase the emission limit nor have they shown if expected reductions under permit conditions A5a and A5b are capable of offsetting such an increase.
- 4) Table 3 lists 4 Caterpillar units as dual fired and is incorrect. Caterpillars are only gas fired.

Your consideration of these comments is appreciated.

Very truly yours,

D. C. Summerfull
D. C. Summerfield

Air Pollution Engineer Assistant

DCS/vi



#### STATE OF FLORIDA

### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

February 29, 1984

Mr. James Ridgely Regency Square Shopping Center 9501 Arlington Expressway, E-26 Jacksonville, Florida 32211

Dear Mr. Ridgely:

The bureau is in receipt of your letter dated February 23, 1984, in which you requested an extension of the expiration date of your construction permit, No. AC 16-60981. The bureau is in agreement with the request and the following shall be added or changed.

#### Expiration Date:

From: December 31, 1983 To: June 30, 1984

#### Attachment to be incorporated:

12. Mr. John B. Koogler's letter dated February 23, 1984.

This letter and attachment shall be attached to your construction permit, No. AC 16-60981, and shall become a part of that permit.

Sincerely,

Victoria J Tschinkel

1 Behindel

Secretary

VJT/s

attachment

cc: Nancy Wright Jerry Woosley Doug Dutton State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

#### INTEROFFICE MEMORANDUM

F And	or Routing To District Offices Or To Other Than The Address	800
To:	Loctn.:	
	Loctn.:	
To:	Loctn.:	
From:	Date:	
Reply Optional [	Reply Required [ ]	Info. Only [ ]
Date Due:	TDate Due:	14.4

FEB 83 1994

TO: Victoria J. Tschinkel, Secretary

FROM: C. H. Fancy, Deputy Bureau Chief Talagyo Lo-Office of the Secretary

DATE: February 29, 1984

SUBJ: Approval and signature of a modification to the construction permit, No. AC 16-60981, for Regency Square Shopping Center (was Regency Square Properties, Inc.), issued July 18, 1983.

Enclosed is a modification to the referenced construction permit and the bureau recommends approval.

CHF/BM/s

enclosure

PS Form	SENDER: Complete items 1, 2, and 3.  Add your eddress in the "RETI reverse."	RN TO" space on
3811, Jan.	1. The following service is requested (chec.  Show to whom and date delivered.  Show to whom, date and address or	
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. 3	(CONSULT POSTMASTER FOR F  ARTICLE ADDRESSED TO:  KINSULT  KINSULT	EES)
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HO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

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# Separator

# **PSD**

SKEC 258-84-01

June 29, 1984

Mr. Clair Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

DER JUL 2 1984

Subject:

Regency Square Properties, Inc.

Duval County, Florida

Construction Permit AC16-60981

Dear Mr. Fancy:

As I've discussed with Mr. Bruce Mitchell of your staff, we would like to request several modifications to the subject Air Pollution Source Construction Permit. This permit was issued to Regency Square Properties for the installation of a dual fuel fired electric power generating unit at the Regency Square Properties Total Energy Plant and for an increase in the hours of operation of the existing electric power generating units at this facility.

Specifically the construction permit addressed the installation of a electric power generator driven by a Worthington reciprocating engine. This unit was identified as Worthington generating unit No. 5. In addition, Regency Square Properties requested, and was permitted for, an increase in the hours of operation of five existing generating units driven by Worthington dual fuel fired engines (units 1, 2, 3, 4 and 6); seven generating units driven by natural gas fired Caterpillar engines (units 1, 2, 3, 8, 9, 10 and 11) and two air conditioning chillers driven by natural gas fired Caterpillar engines. Subsequent to the issuance of the permit, Regency Square Properties has decided to permanently retire Worthington units 1 and 5 and Caterpillar units 1, 8 and 9.

Also subsequent to the issuance of the subject construction permit, air pollution emission measurements were made on various units at the Total Energy Plant in December, 1983 and the results reported to your office. These emission measurements demonstrated that the

nitrogen oxides emissions from the Caterpillar engines exceeded the emission rates anticipated in the Construction Permit Application. Nitrogen oxides emission rates from the Caterpillar engines ranged nominally from 0.7 to 1.0 pounds per hour whereas the engines were permitted for nitrogen oxides emission rates of 0.2 pounds per hour (based on limited earlier emission measurements).

Regency Square Properties is requesting that the subject Air Pollution Source Construction Permit be modified to reflect the permanent retirement of Worthington generating units 1 and 5 and Caterpillar generating units 1, 8 and 9 and other modifications that will result in a higher allowable nitrogen oxides emission limit for the Caterpillar engines. The modifications will require that the maximum generating capacity of the facility be reduced to 53.9 million kilowatt hours per year; the maximum hours of operation of all generating units shall not exceed 50,379 hours per year and that within this cap the Worthington engines will be permitted to fire 100 percent diesel fuel for 5,400 hours per year.

Further, Regency Square Properties is requesting that specific condition A5a be modified to reflect a maximum diesel fuel consumption of 646,100 gallons per year if the Worthington engines operate 5,400 hours per year on 100 percent diesel fuel: that specific condition A5b be modified to allow the consumption of 176,790 gallons per year of diesel fuei if all engines are dual fuel fired for a maximum of 50,379 hours per year; that specific condition A5c be modified to allow the consumption of 620.2 million cubic feet of natural gas per year if all engines are dual fuel fired for a maximum of 50,379 hours per year; and that specific condition A5d be modified to allow the combustion of 550.7 million cubic feet of natural gas per year if the Worthington engines operate a maximum of 5,400 hours per year on 100 percent diesel fuel. Regency Square Properties also requests that specific condition A6 be changed to allow a nitrogen oxides emission rate of 1.1 pounds per hour from all Caterpillar engines. The emission limits for the other pollutants in specific condition A6 are acceptable.

Regency Square Properties requests that some of the specific conditions related to the Caterpillar engines driving the air conditioning units also be modified. Specifically, it is requested that specific condition B2 be modified to allow the total operating hours for the two engines to not exceed 4,000 full load hours per year and that condition B4 be modified to allow emission rate of 1.1 pounds of nitrogen oxides per hour from each of the two engines.

Under conditions of the above requested modifications, the maximum annual nitrogen oxides emission rate from the facility, as reflected in specific condition C1, will not exceed 416.3 tons per year. Other maximum air pollutant emission rates from the facility, as reflected in specific condition C2, will be:

VOC	21.5 tons per year
00	139.2 tons per year
SO <sub>2</sub> Particulate Matter	12.4 tons per year
Particulate Matter	13.0 tons per year

The calculations supporting the requested permit modifications are attached hereto. These calculations and summary tables represent revision to data originally submitted to your office on March 25, 1983 and revised on May 13, 1983. The data also references calculations prepared by Mr. Bruce Mitchell of your office and filed under an interoffice memo dated May 9, 1983.

For purposes of clarification, I would like to state that the retirement of the various Worthington and Caterpillar engines resulted from a decision made by a new management group at Regency Square; not from indecision on the part of the management group that initiated the original permit application. If there are any questions regarding the requested modifications, please feel free to contact me.

Very truly yours,

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS

Jøhn B. Koøgler, Ph.D., P.E.

JBK:ssc Attachments

cc: Mr. Bill Johnson

TABLE 1

## SUMMARY OF FUEL CONSUMPTION, GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES EXCEPT THE 9 CATERPILLARS WHEN OPERATING AT 100% CAPACITY ON DIESEL FUEL

### REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

·i	Fuel Diesel	Generating Capacity	100% of the Time Pollutant Emissions (tpy)				
Engine ————	(gal/yr)	(kw/yr)	NOx	НС	CO	SO <sub>2</sub>	PM
2 3	700.8 x 10 <sup>3</sup> 700.8 x 10 <sup>3</sup>	8.06 x 106 8.20 x 106	41.1 41.8	2.0 2.1	36. 3 36. 9	11.3	12.1
4 6	1050.0 x 103 1230.0 x 10 <sup>3</sup>	12.60 x 106 15.16 x 106	64. 2 77. 3	3.1 3.8	56.6 68.2	17.6	19.0
otal	3681. 6 x 103	<b>44</b> .1 x 10 <sup>6</sup>	224.4	11.0	198.0	61.6	66.1
	Per 1,000 Hours Per Engine		6.40	0.31	5.65	1.75	1.6

TABLE 2

SUMMARY OF FUEL CONSUMPTION GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES WHEN OPERATING AT 100% CAPACITY ON DUAL FUEL

## REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

	Fue	1 Use	Generating					
	Gas	Diesel	Capacity	P	ollutant	Emissions	(tpy)	
Engine	(ft <sup>3</sup> /yr)	(gal/yr)	(kw/yr)	NOx	HC	CO	\$0 <sub>2</sub>	PM
2	119.2 x 106	46.3 x 10 <sup>3</sup>	10.95 x 10 <sup>6</sup>	110.6	·3.8	24.3	0.8	٥.8
3	126.5 x 106	53.2 x 103	11.83 x 10 <sup>6</sup>	199. 9	6.5	26.3	0.9	0.9
2 3 4 6	162.3 x 106	48.8 x 103	15.33 x 10 <sup>6</sup>	55.2	3. B	33.6	0.9	0.9
	192.2 x 106 226.7 x 106	64.5 x 103	18.72 x 106.	155.4	12.2	41.2	1.2	1.2
4 Cats	2.26.7 X 100	-0-	17.52 x 106	19.3≆	1.8	36.8	0.1	0.0
Worthingtons	600.2 x 106	212.8 x 10 <sup>3</sup>	56.83 x 106	521.1	26.3	125.4	3.8	3.8
Caterpillars	226.7 x 106	0	17. 52 x 106	19.3	1.8	36.8	0.1	0.0
Total	826.9 × 10 <sup>6</sup>	212.8 x 103	<b>74.3s</b> x 10 <sup>6</sup>	540.4	28.1	162.2	3. 9	3.8
Emission Rate	Worthingto	ons		14.87	0.75	3.58	0.11	0.11
Per 1,000 Engine Hours	Caterpilla		•	0,55	0.05	1.05	0.001	0.0

<sup>\*</sup> Based on a 1.1 lb/hr emission rate

Revised 6/28/84 Ravised 5/13/83

#### SECTION 2.0

CALCULATION OF EMISSION INCREASES FOR PROPOSED ADDITIONAL HOURS OF OPERATION

REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

#### Assume:

- 1. Caterpillars operate 40% of engine hours when engines operate on dual fuel
- 2. Worthingtons operate 60% of engine hours when engines operate on dual fire!
- 3. Engines operate 80% of total engine hours on dual fuel
- 4. Engines operate 20% of total engine hours on diesel fuel
- 5. Two Caterpillar engines used for air conditioning compressors operate a total of 4000 hours per year ( Full load)
- 6. Emissions from air conditioning Caterpillars at 100% capacity and the same as from generating Catorpillars at 100% capacity.

#### Emissions Calculation

1.0 Air Conditioning Units 4000 fotal hours 100% gas Ruel

```
NOx - (4.0 thousand hours) x 0.55 16/1000 hrs (Tell Z) = 2.2 try
HC = (4.0) × 0.05 16/1000 hrs
                                                = 0.2 try
CO = (40) × 1.05 16/1000 hrs
                                                = 4.2 try
SO2 = (40) x 0.001 lb/1000 hrs
                                                = 40.1 tpy
PM * (4.0) x 0
                                                = 0.0 tpy
```

20 Generating Units 127,000 hours total

2.1 Dual Fuel @ 80% of time

= 27,000 x0, B

2.1.1 Worthingtons @ 60% of time

= 21600 × 0.6 = 12960 hr/4-

NOx = (12.96 Housend hrs) x 14,87 lb/1000 hrs (Table 2) = 192.7 tpx

HC = (12.96 ) x 0.75 9.7 ter CO = (12.96 ) x 3.58 46.4 try

SOt = (12.96) x 0.11 1.4 tpy 1.4 tpy

PM = (12.96) x 0 11

```
2.1.2 Caterpillars @ 40% of time
             = 21600 x 0. 4
             = 8640 hr/yr
          NOx = (8.64 thousand hrs) x 0.55 16/1000hrs (Table 2) = 4.8 tpy
                                                           = 0.4 tex
          HC =(8.64 ) x 0.05
          CO = (8.64 ) x 1. 05
                                                          = 9.1 tex
          SO2 = (8.64 1) x 0.001
                                                          = 40.1 tpy
          PM = (8.64) x 0
                                                          = 0.0 tex
2.2 Diesel fuel 20% of time
            = 27,000 x 0.7
            = 5400 | ha /yr (all Worthingtons)
          NOx = (5.40 thousand has) (6.40 15/1000 has - Table 1) = 34.6 toy
                                                              1.7 tex
          HC = ( 5.40 ) x 0.31
          Co = (5.401) . 5.65
                                                             30.5 try
          50_2 = (5.40) \times 1.75
                                                              9.5 try
                                                             10.2 try
          Ph = (S.40 |) x 1.89
7.3 Dual fuel 100% of time
            Worthingtons - 60% of hours = 27000 x0.6 = 16200 hr/yr
            Caterpillars - 40% of hours = 27000 x0.4 = 10800 hr/r
     NOx = 16.200 (14.87 - Table 2) + 10.800 (0.55 - Table 2) = 240.9 + 5.9 = 246.8 tpy
                                                        12.2 + 05 = 12.7 tpy
      HC =16.200 (0.75) +10.800 (0.05)
                                                        58.0+ 11.3 = 69.3 py
      CO = 16.200 (3.58) + 10.800 (1.05)
                                                         1.8+ 0 = 1.8+px
      50_2 = 16.700 (0.11) + 10.800 (0.001)
      Ph = 16.200 (0.11) +
                                                          1.8+0 = 1.8tpy
2.4 Generating Capacities
    2.4.1 Dual fuel 80%
               Worthingtons = (12960 hrs) (56.83 x10 - Table 2) 8760 x4 operating hrs
                           = 21.02 × 10 6 KW/Yr
              Catarpillars = (8640 hrs) (17.52 × 10 - Table 2) /4 × 8760 total possible
                               4. 32 × 10 6 KW/40
    2.4.2 Diesel 20%
              Worthingtons = (5400 hr) (44.1 x 106 - Table 1)/4x 8760 total prescible
                           = 6.80 × 106 KW/Yr
    2.4.3 Duel Feel 100%
```

Worthingtons = 21.02 (100/80) x106 = 26.28 x106 KW/Yr

Caterpillars = 4.32 (100/80) × 10 = 5.40 × 10 kw/yr

2.5 Fuel Consumption

2.5.1 Dual fuel 80% of time

Gas: Worthingtons = [12960 hrs)/(4×8760)] × 600.2×106- Table 2

= 222.0 ×106 ft<sup>2</sup>/yr

Caterpillars = [(8640)/(4×8760)] x 226.7×106-Tallez = 55.9 ×106 ft3/yr

Diasel: Worthington, = [(12960) /(4x8760)] x 212.8 x103 - Taller = 78.71 × 103 gal/yr

2.5.2 Diesel fuel 20% of time

Diesel: Worthingtons = [(5400 hr)/(4.820)] x 3681.6 x103- Table 1 = 567.4 x 103 gal/yr

2.5.3 Dual fuel 100 % of time

Gas: Worthingtons = 222.0 x10 (100/80) = 277.5 x10° f+3/yr

Caterpillars = 55.9 × 10° (100/80) = 69.9 × 10° P+3/40 Diesel: Worthingtons = 78.7 × 10° (100/80) = 98.4 × 10° gel/40 3.0 Calculation of Present Actual Emissions

Permitted hours of operation (ACIG-40548) = 23,379 ha/xr Parmitted emissions based on dual Fiel Figing 100% of time

Example Galculations

Actual hours of operation (normalized to total to angua operating time of 23,379 hr/rr) = 2863 hr/rr

Refer Calculation NOx = (2863/8700) (67.3 try @ 100% - Table 7)

= 22.0 try

El man 33 / 11 -

under mamo dated 519183

€ 1.4 try

Actual operating hours = 345x hr/yr

NOx = (3457/8760) (110.6 tpy @ 100% Table 7) = 43.6 tex

Summary (From FDER Calculations)

	Operating		Aunual	Emissians (	(tpy)	
Engine	(hr/yr)	No <sub>x</sub>	нс	0	So <sub>2</sub>	PM
1	2863	19.9	1.3	7. 2	0.2	0.2
2 3	3457	39.0	1.4	8.6	0.3	0.3
3	3295	62.4	2.0	8.3	0.3	0.4
4	1704	10.2	0.7	6.2	0.2	O. Z
2	0	0	0	0	0	0
6	2249	35.1	2.8	9.4	0.3	0.3
9 Cats	9811	0.7	0.4	9.3	0.1	0
Total	23,379	167.3	8.6	49.0	1. 4	1.4

SHOLTES \* KOOGLER

TABLE 3

PROPOSED INCREASES IN OPERATING RATES

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

			Annua! Generating	Annual Operating	P	Annual Pollutant Emission Rate (tons per year)				
	Engine(s)	Fuel	Capacity (kw)	Time (hrs)	NOx	HC	CO	SO <sub>2</sub>	РМ	
Increase from firing dual fuel 80% of the time & diesel fuel 20% of the time.	4 Worthingtons	Duat Diese!	21.02 x 10 <sup>6</sup> 6.80 x 10 <sup>6</sup>	12,960 5,400	197.2 34.6	9.7	46.4 30.5	1.4 9.5	1.4	
	4 Caterpillars	Gas	$4.32 \times 10^6$	8,640	4.8	0.4	9.1	0.1	0.0	
	2 Caterpillars (A/C)	Gas		4,000	2.2	0.2	4.2	0.1	0.0	
Total			32.14 x 10 <sup>6</sup>	31,000	238.8	12.0	90.2	11.1	11.6	
Increase from firing	4 Caterpillars	Dual	26.28 × 10 <sup>6</sup>	16,200	240.9	12.2	58.0	1.8	1.8	
dual fue! 100% of the time	4 Caterpillars	Gas	5.40 × 10 <sup>6</sup>	10,800	5.9	0.5	11.3	0.0	0.0	
	2 Caterpillars	Gas		4,000	2.2	0.2	4.2	0.0	0.0	
Total			31.68 x 10 <sup>6</sup>	31,000	249.0	12.9	73.5	1.8	1.8	
De Minimus Emission In	crease		<u>_</u> :		250	250	250	250	250	

# TABLE 4

# PROPOSED OPERATING CONDITIONS FOR ALL ENGINES; EXISTING PLUS PROPOSED

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

	Annual	Annual Operating	Annual Fuel Co	onsumption		Annual	Emissions	(†py)	
Condition	Generating Capacity (kw)	Time (hrs)	Diesel (gal)	Gas (ft <sup>3</sup> )	NO×	НС	co.	\$02	PM
Permitted/Actual	$22.26 \times 10^6 (1)$	23,379	78.39 × 10 <sup>3</sup>	246.4 × 10 <sup>6</sup>	167.3	8.6	49.0	1.4	i.4
Increase Dual Fuel 100%									
4 Worthingtons 4 Caterpillars 2 Caterpillars	$26.28 \times 10^{6}$ $5.40 \times 10^{6}$ $0$	16,200 10,800 _4,000	98.4 × 10 <sup>3</sup> 0 0	$277.5 \times 10^{6}$ $69.9 \times 10^{6}$ $26.4 \times 10^{6}$	240.9 5.9 2.2	12.2 0.5 0.2	58.0 11.3 4.2	1.8 0.0 0.0	1.8 0.0 0.0
Total With Dual Fuel 100%	53.94 × 10 <sup>6</sup>	54,379	176,790	620.2 × 10 <sup>6</sup>	416.3	21.5	122.5	3.2	3.2
Increase Dual 80% - Diesel 20%			<del></del>						
4 Worthingtons 4 Caterpillars 2 Caterpillars	27.82 × 10 <sup>6</sup> 4.32 × 10 <sup>6</sup>	18,360 8,640 4,000	. 646.1 x 10 <sup>3</sup>	$222.0 \times 10^{6}$ $55.9 \times 10^{6}$ $26.4 \times 10^{6}$	227.3 4.8 2.2	11.4 0.4 0.2	76.9 9.1 4.2	10.9 0.1 0.1	0.0 0.0
Total With Dual 80% - Diesel 20%	54.40 × 10 <sup>6</sup>	54,379	646,100	550.7 × 10 <sup>6</sup>	406.1	20.6	139.2	12.4	13.0

<sup>(1)</sup> FROM FDER CALCULATIONS.

REVISED 5/13/83 REVISED 6/28/84

February 23, 1984

Mr. C. H. Fancy Florida Department of Environmental Requaltion Bureau of Air Quality Management Twin Towers Office Building 2600 Blair Stone Road Tallahassee, FL 32301

Duval County - AP Subject:

> Regency Square Shopping Center Construction Permit AC16-60981

Dear Mr. Fancy:

The subject air pollution source construction permit was recently issued to the Regency Square Shopping Center in Jacksonville, Fiorida. The construction permit covered the installation of a natural gas/diesel fuel fired electric power generator and established operating hours for several other electric power generating units and engines operating air conditioning chillers associated with the total energy plant.

Subsequent to the time this construction permit was issued, a decision was made by Regency Square to change the permitted mode of operation of the total energy plant. The changes involved removing six of the permitted engines; two Worthington and four Caterpillar engines, from operation and the placement of the remaining power generating engines on a stand-by basis.

In addition to the changes in the mode of operation, emission measurements on the engines that will remain in operation were conducted by Sholtes & Koogler, Environmental Consultants, Inc. in December, 1983. These emission measurements indicate that the permitted NOx emission rates for four of the Caterpillar engines will have to be reviewed and modified.

In view of the changes in the plan of operation of the total energy plant and the modifications in permit for the facility that will be entailed, I am requesting a six-month extension on the expiration date of the Construction Permit. I would like to request that the expiration date be extended until June 30, 1984. I will be in contact with your office in the near future to discuss the modifications that will be necessary to the permit for this facility. Your cooperation in this matter is appreciated.

Very truly yours,

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS, INC.

John B. Koog (er, Ph.D., P.E.

JBK:ssc

cc: Mr. Wayne E. Tutt

Mr. Doug Dutton Mr. Bill Johnson Bruce Hear! Hear!

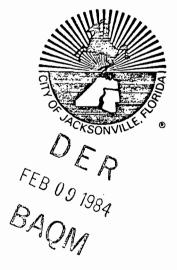
DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES

Bio-Environmental Services Division Air and Water Pollution Control February 7, 1984

Mr. Jim Ridgely Regency Square Shopping Center 9501 Arlington Expressway, E-26 Jacksonville, Florida 32211

Re: Total Energy Plant

Dear Mr. Ridgely:



This letter summarizes our telephone conversation of Friday, February 3, 1984. There are several matters concerning the Florida Department of Environmental Regulation (FDER) air pollution permit for the Regency Square energy plant that need to be addressed. first matter that must be resolved is who is the legally responsible party, relative to environmental permitting and compliance with pollution control rules and regulations. It is my understanding that Regency Square Properties, Inc. is still the owner of the property, but R. S. Properties, Inc. a different entity, now operates the Mall and the energy plant under a lease agreement. It is also my understanding that for permitting purposes, the property owner is the permittee, unless there is contract language designating the lessee as being responsible for such matters. In order to remove Regency Square Properties, Inc. as permittee, and add R. S. Properties, Inc., you will need to supply a copy of that contract language giving the lessee responsibility. Also, I have enclosed a transfer of permit form which must be executed by the former permittee and the new party. Once this is done, and assuming that the contract language is acceptable to the FDER Office of General Counsel, then the lessee, R. S. Properties, Inc. can be designated permittee.

Secondly, the air pollution construction permit, No. AC16-60981 expired on December 31, 1983. Therefore, the total energy plant is currently without a valid FDER permit, which violates Section 17-2.210 Florida Administrative Code. In addition, we have received the report of the air pollution emissions compliance test performed at the total energy plant by Sholtes & Koogler Environmental Consultants during December 1983. This report indicates that Worthington engines 2, 3, 4 and 6 complied with permit emission limits. Worthington units 1 and 5 were not tested, however, testing was required pursuant to permit AC16-60981. Likewise, four of the caterpillar units were not tested. If you intend to permanently retire those 6 engines, you may de-permit them, and they would then not need to be tested. It must be pointed out that should you decide at some future time to put these units in service, they must then be permitted prior to use. If you wish to maintain a permitted status for these units, they must be tested pursuant to the conditions of permit AC16-60981, and demonstrate compliance with applicable permit emission limits. Caterpillar units 3, 10, 11 and JB failed to meet permit emission limits, and test results PAGE 2 Mr. Jim Ridgely Re: Total Energy Plant February 7, 1984

on Caterpillar unit JA are unacceptable because the unit was tested "without appreciable load", according to the test report. If you wish to maintain these units in service, they must be retested as soon as possible, and demonstrate compliance with applicable permit limits.

No operating permit can be issued to any source of air pollution which has not demonstrated compliance with applicable emission limits. It is suggested that the simplest solution to the problems discussed above would be to request a 6 month extention to construction permit AC16-60981, and retest those units which failed to demonstrate compliance, and which you do wish to keep in service. At least 90 days prior to expiration of the construction permit, you should apply for an operating permit, and at that time you can surrender the permit of any units which you may have decided to permanently retire.

Please respond to this letter on or before February 17, 1984 indicating your intentions with regard to the issues raised herein. Any request for permit extension will be forwarded to the FDER Central Air Permitting group in Tallahassee for final approval. If you have any questions about this matter, please telephone this Office at 633-3303.

Very truly yours,

Wayne E. Tutt Associate Engineer

WET/vj Enclosure

cc: Mr. Doug Dutton - FDER

ec: Mr. Clair Fancy, P.E., CAPS, FDER

#### STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

November 22, 1983

CERTIFIED MAIL - RECEIPT REQUESTED

Dr. John B. Koogler Sholtes & Koogler, Environmental Consultants 1213 Northwest 6th Street Gainesville, Florida 32601

Re: Regency Square Properties, Inc.
Construction Permit: AC 16-60981

Dear Dr. Koogler:

The bureau is in receipt of your letter dated September 7, 1983, regarding the above referenced facility and construction permit. Per your phone conversations with Bruce Mitchell and a meeting held with him at the bureau, the responses to your letter are as follows:

- 1. Mass emission and visible emissions compliance tests shall be required to be conducted on all of the Caterpillar and Worthington engines and in accordance with 17-2.700. Based on prior tests and the projected pollutant emissions, the Worthingtons shall have compliance tests conducted while firing dual-fuel. The new No. 5 Worthington shall be tested while firing 100% diesel fuel also. Upon completion of the required compliance tests, Regency Square Properties, Inc. may apply for an alternate procedure and testing requirement through the bureau and in accordance with 17-2.700(3).
- 2. Since Regency Square Properties, Inc. told you that they would be able to shut down all of the Caterpillars except for the one being tested, the existing fuel flow meter will be able to record the fuel consumed on a per engine basis.
- 3. The purpose behind maintaining a net electrical exchange of zero during any period of time is to avoid review under the category of a utility, as contained in the federal New Source Performance Standards and Florida Administrative

Dr. John B. Koogler Page Two November 22, 1983

> Code Rules 17-2 and 17-17. A sliding 12-month period to net a zero electrical exchange should be achievable for the majority of the time. When and if Regency Square Properties, Inc. feels that an exception to this condition will be needed, a meeting with the bureau, the DER's Northeast Florida District and the Duval County's Bio-Environmental Services should be initiated to assess and resolve the situation.

If there are any questions regarding these matters, please call Bruce Mitchell at (904) 488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E. Deputy Chief

BAQM

Mr. Robert C. Gillander cc: Marti Hall Jerry Woosley

Doug Dutton

PS Form	SENDER: Complete items 1, 2, and 3.  Add your address in the "RETURN TO" space on reverse.	
Form 3811, Jan. 1979	1. The following service is requested (check one.)  Show to whom and date delivered	
7	(CONSULT POSTMASTER FOR FEES)	
RETURN RECEIPT, REGISTERED, INSURED AND CORTIFIED MAI	Dr. John B. Koogler  1213 N.W. 6th Street  Gainesville, FL 32601  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO.  P408530371  (Always obtain signature of addressee or particular described above SIGNATURE DAddressee Bruthorizated A.  DATE OF CELIVERY  12883  5. ACORESS (Coroplete only if requested)	
TIFIED MAIL	6. UNASLE TO DELIVER BECAUSE: CLERK'S INITIALS	٠

# P 408 530 371

TO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAPL

(See Reverse)

I	ent to Or. John B. Koog	ler
1	treet and No.	
P	.O., State and ZIP Code	
7.	ostage	5
1	Cartified Fee	
15	Special Delivery Fee	
1	Restricted Delivery Fee	
1	Return Receipt Showing to whom and Date Delivered	
i	Return Receipt Showing to whom, Date, and Address of Delivery	
	TOTAL Postage and Fees	\$
3 }	Postmark or Date	
Form 5000, 1 co. 1505	11/22/83	

SKEC 258-81-01

September 7, 1983

Mr. Bill Thomas
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tailahassee, Florida 32301

DER

-- 1445-

SEP 0 9 1983

BAQM

Subject: Regency Square Properties, Inc. Construction Permit AC 16-60981

Dear Bill,

I would like to confirm our telephone conversation of today regarding some of the permit conditions in the subject construction permit that was recently issued to Regency Square Properties. The matters discussed included the emission testing requirements for the seven Caterpillar engines used to generate electric power, the requirement for measuring the fuel flow (natural gas) to the seven Caterpillar engines used for generating electric power and the requirement for a net electric power exchange of zero between Regency Square Properties and any outside utility.

Specific Condition A-7 requires that emission measurements for nitrogen oxides and visible emissions be conducted on the engines used to drive the electric power generators and Condition B-5 requires that similar tests be conducted on the two Caterpillar engines used to drive the air conditioning chillers. Since the seven Caterpillar engines used to generate electric power (and covered by Specific Condition AC-7) are identical and since nitrogen oxides emissions from these engines are limited to 0.2 pounds per hour, I would like to request that annual compliance testing be limited to no more than two of these identical engines per year. Likewise, since the two Caterpillar engines are used to drive the air conditioning chiller are identical, with nitrogen oxides emissions limited to 0.2 pounds per year, I would request that annual emission testing be limited to only one of these engines per year.

(2)

(1)

(4)

(5)

(6)

The testing of a representative number of the Caterpillar engines during each annual period appears reasonable since all nine of the Caterpillar engines, the seven used for electric power generation and the two used to drive the air conditioning chillers, are identical and since the hourly nitrogen oxides emission rate from each engine is so minuscule. The specific engines tested each year, under the proposed test plan, will be rotated so that each of the engines will eventually be tested.

The second matter regarding the Caterpillar engines refers to Specific Condition C-6. This Condition requires that each engine have a fuel flow meter for each type of fuel consumed in the engine. Gas flow meters and fuel oil meters are presently in place on the Worthington engines and gas flow meters are presently in place on the two Caterpillar engines driving the air conditioning chillers. Regency Square Properties, in a recent letter to me, stated that the installation of gas meters on the seven Caterpillar engines used for electric power generation would be quite an expensive undertaking and asked if it might be possible to report only the total gas flow to the seven Caterpillar engines since all of these engines are identical.

Each of the seven Caterpillar engines used for generating electric power have engine hour recorders and the total gas flow to the seven engines can be determined. With the information presently available, the Department can be provided the number of hours each of the seven Caterpillar engines operated, the total number of hours the seven engines operated and the total natural gas flow to the seven engines. This will provide sufficient information to enforce all current permit conditions attached to these engines. I would appreciate it if you will consider this alternative to providing the fuel flow to each of the seven Caterpillar engines individually.

The final matter that we discussed was related to Specific Condition A-3; the condition that requires that the net electric power exchange between Regency Square Properties and any outside utility be zero during any 12 month period. This matter was addressed in my letter to the Department dated July 8, 1983. In this letter, it was stated that it is the intention of Regency Square Properties for the net electric power exchange to be zero but due to practical consideration, there may be 12 month periods when the electric power exchange is other than zero. Our concern is that Regency Square Properties might become the target of overzealous enforcement activities at some future date if the net electric exchange did not balance out to 0.0 during any 12 month period; a balance very difficult to meet exactly when one considers the total generating capacity of the facility is 56.7 million kilowatt hours per year.

Mr. Bill Thomas
Florida Department of
Environmental Regulation

Condition C-3 requires that Regency Square Properties report all electrical exchanges between Regency Square Properties and any outside utility during the recording year. It is proposed that this requirement be retained and that another condition be added requiring that Regency Square Properties report and justify to the Department reasons that may result in net exchange other than zero. The time schedule for reporting net exchanges that would be other than zero at the end of a reporting year as well as limits on the net power exchanged is open for negotiation. I will discuss these matters with Regency Square Properties and would then appreciate the opportunity to discuss these matters with you and your staff.

I would appreciate a response to our request for clarification on the testing requirements for the Caterpillar engines as soon as possible since we will need to schedule tests on these engines sometime in late September or early October, 1983. The other matters can be pursued with lesser urgency. Thank you very much for your considerations to these matters.

Very truly yours,

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E.

JBK: Idh

(7)

**(8)** 

cc: Mr. Robert C. Gillander

#### STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

July 19, 1983

Mr. Robert C. Gillander, Jr. Executive Vice-President Regency Square Properties 9501 Arlington Expressway Jacksonville, Florida 32211

Dear Mr. Gillander:

Enclosed is Permit Number AC 16-60981 dated July 18, 1983, to Regency Square Properties, issued pursuant to Section 403, Florida Statutes.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely.

for C. H. Fancy, P.E.

Deputy Bureau Chief Bureau of Air Quality

Management

CHF/bjm

Enclosure

cc: Dr. John B. Koogler, P.E., Sholtes and Koogler Environmental Consultants

Mr. Doug Dutton, DER Northeast District

Mr. Jerry Woosley, Duval County Bio-Environmental Services
Division

# FINAL DETERMINATION

Regency Square Properties, Inc.
No. 5 Worthington Engine/Generator Set and Facility Modification

Permit Number:

AC 16-60981

Florida Department of Environmental Regulation Bureau of Air Quality Management Central Air Permitting Section

July 18, 1983

# Final Determination Regency Square Properties, Inc.

No. 5 Worthington Engine/Generator Set and Facility Modification

The construction permit application has been reviewed by the department. Public notice of the department's intent to issue was published in the Florida Times-Union on June 3, 1983. The preliminary determination and technical evaluation was available for public inspection at the Duval County's Bio-Environmental Services (BES) office, the DER's Northeast District office and Bureau of Air Quality Management office.

Comments were received from Mr. Wayne E. Tutt (Attachment 10) with BES and Mr. John B. Koogler (Attachment 11) with Sholtes and Koogler, Environmental Consultants, Inc. The paragraphs in each attachment have been numbered in sequence for convenience. Each paragraph (P.) will be answered (A.) in sequence. Any revisions to the "Specific Conditions" will follow directly:

#### P.1.

A. "Specific Condition: No. A.7." requires that a compliance test per engine for  $NO_X$  and VE be conducted and by what method. However, it will be restated to be more easily understood.

# Specific Condition:

- A.7.: From: Compliance tests to verify the above NO<sub>X</sub> emission limits shall be DER Method 7 in accordance with Chapter 17-2.700, FAC. Compliance tests for visible emissions (VE) shall be DER Method 9 in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted capacity.
  - To: Compliance tests shall be required for  $NO_X$  and visible emissions (VE) and the test methods shall be DER Methods 7 and 9, respectively, in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted generating capacity.
- B.5.: From: Compliance tests shall be DER Method 7 for  $NO_X$  emissions and in accordance with Chapter 17-2.700, FAC. Visible emissions (VE) tests shall be DER Method 9 and in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted capacity.
  - To: Compliance tests shall be required for  $NO_X$  and VE and the test methods shall be DER Methods 7 and 9,

respectively, in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted fuel consumption capacity.

The  $NO_{\mathbf{x}}$  emission rate for the No. 6 Worthington engine is the second smallest of all of the current operating and tested Worthington engines (Nos. 1-4, 6) and yet, is the largest in megawatt capacity of these engines. Using the NO<sub>X</sub> emissions rate of the No. 6 Worthington engine to project the NO<sub>x</sub> emissions of the No. 5 Worthington engine (which has a larger megawatt capacity) is not exact nor actual, but, is a best estimate until a performance test has been conducted. A performance test will be required to assure that the No. 5 Worthington engine can meet the maximum allowable NO<sub>x</sub> emission limit proposed prior to receiving an operating permit. A Prevention of Significant Deterioration review and alternate strategies will be required if the No. 5 Worthington engine exceeds the proposed maximum allowable NO<sub>x</sub> emission limits. Therefore, "Specific Condition: No. A.6." will remain as drafted.

# Specific Condition:

A.6.: No change

P.2.

A. Notice is hereby given to the Regency Square Properties, Inc. (RSP), that the  $\mathrm{NO}_{\mathrm{X}}$  emission limits contained in the New Source Performance Standards, Subpart FF, for stationary internal combustion engines, will be immediately imposed on the No. 5 Worthington engine after the final rule is promulgated and the department adopts the standard by reference, unless the RSP can otherwise prove non-applicability.

#### P.3. and 4.

A. The Regency Square Properties, Inc., (RSP) total energy plant has an operating program that includes planned and scheduled engine outages for maintenance, etc. However, it is acknowledged that there are or could be unscheduled engine outages that are not within the program, but still have to be handled. Consequently, the bureau feels that a sliding 12 month period is adequate to achieve the "net zero" electrical exchange between RSP and any outside utility. Therefore, "Specific Condition: No. A.3." will remain as drafted.

# Specific Condition:

A.3.: No change.

P.5.

A. The annual cap of natural gas for the Caterpillar engines

driving the air conditioning chillers was discussed. "Specific Conditions: Nos. B.2. and B.3." will be amended.

# Specific Condition:

- B.2.: From: Maximum total annual operating hours for the two engines shall not exceed 3500 hours per year.
  - To: Maximum total annual operating hours for the two engines shall not exceed 3500 full load hours per year.
- B.3.: From: Maximum natural gas consumption per engine shall not exceed 6,469 ft<sup>3</sup>/hr.
  - To: Maximum natural gas consumption per engine shall not exceed 6,469  $\rm ft^3/hr$  and the maximum total annual natural gas consumption for the two engines shall not exceed 22.65 x  $10^6$   $\rm ft^3/yr$ .

In order to verify engine operating hours and fuel consumption per type and per engine, the applicant agreed to install timers and fuel flow meters. Therefore, the following "Specific Condition" will be added to section C: Facility:

# Specific Condition:

C.6.: Each engine will be equipped with a timer to record actual engine running time and a fuel flow meter per fuel type per engine to record the actual fuel consumption per fuel type per engine.

# Attachments to be incorporated:

- 10. Wayne E. Tutt letter dated June 24, 1983.
- 11. John B. Koogler letter dated July 8, 1983.

It is recommended that the construction permit be issued as drafted, with the above revisions and attachments incorporated.



cc: Mr. Doug Dutton - DER

cc: Mr. R. Gillander

DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES

Bio-Environmental Services Division Air and Water Pollution Control

June 24, 1983

Mr. Bill Thomas, Engineer
Bureau of Air Quality Management
Fla. Dept. of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32301

Re: Regency Square Properties Worthington Engine No. 5

DER JUN 28 1983

BAQM

Dear Mr. Thomas:

This Office has reviewed the technical evaluation and preliminary determination prepared on the referenced source, and offers the following comments -

- (1) Specific Condition A. 7. identifies compliance test methods for  ${\rm NO}_{\mathbf{x}}$  and visible emissions, however nowhere is there a requirement that compliance tests be conducted. This testing is not optional, but is very clearly required pursuant to Section 17-2.700(2)(a)1 to wit - "The owner or operator of a new or modified source that is subject to an emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining an Operation Permit for such source." The maximum allowable NO<sub>x</sub> emission limit for engine number 5, given in the table in Condition No. 6, is based upon measured emissions taken on engine number 6, however engine number 5 has never been tested. It is our opinion that pursuant to 17-2.700(2)(a)1 above,  $NO_{\mathbf{X}}$  and V.E. tests must be done on number 5, and the NO<sub>X</sub> must be less than or equal to 664 PPMV, the measured value of engine no. 6.
- (2) It is noted that there is a proposed NSPS for stationary internal combustion engines, designated Title 40, Part 60, Subpart FF, Code of Federal Regulations. The proposed standard was published July 23, 1979 in the Federal Register, and the proposed applicability is such that if a final rule is published, this engine will be an affected source. It is further noted that the proposed NO<sub>X</sub> emission limit is 600 PPMV for a duel fuel engine, and this standard, if promulgated unchanged, would constitute a restricting of emission limits as allowed in this permit.

Please advise this Agency as to the Department's final position on this matter.

Very truly yours.

Wayne E. Tutt

Associate Engineer

WET/vj



(1)

(2)

AREA CODE 904 / AIR POLLUTION — 633-3033 OR 633-3303 / WATER POLLUTION — 633-3415 515 WEST 6TH STREET / JACKSONVILLE, FLORIDA 32206—4397



SKEC 258-81-01

July 8, 1983

11 sitter we

Mr. Clair H. Fancy
W.D. Chief Bureau of
Air Quality Management
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

DER
JUL 11 1983
BAOM

Subject: Regency Square Properties, Inc.

Permit No. AC16-60981

Duval County

Dear Mr. Fancy:

I would like to comment on three of the specific conditions contained in the subject Air Pollution Source Construction Permit for purposes of clarifying the conditions. The specific conditions which I will address are Condition A3 on Page 6 of the permit and Condition B2 and B3 on Page 8 of the permit.

Condition A3- The condition states "The net electrical exchange between Regency Square Properties, Inc. and any outside utility is to be zero during any 12 month period." It is the intention of Regency Square Properties that the net exchange of electrical power with outside utilities be zero. Due to practical considerations, however, there are periods of time when this exchange might not balance to zero; the exchange could either be positive or negative over a 12 month period. The exchange could be negative (that is, Regency Square Properties would receive more power than they supplied) if Regency Square Properties had an unscheduled shutdown of one of the larger Worthington generator units and had to purchase more power than anticipated. The exchange could be positive if Regency Square, in anticipation of a major overhaul, supplies excess power to the outside utility so that the "banked" excess power could be drawn against during the time of the schedule overhaul.

(3)

(4)

(5)

As stated previously, it is the intention of Regency Square Properties for the net electric power exchange be zero. Over a period of several years, this exchange will be zero or very close to zero. The Department should understand, however, that due to practical considerations of operating the Total Energy Plant, there may be 12 month periods when that electric power exchange is other than zero.

Conditions B2 and B3- Condition B2 states, "Maximum total annual operating hours for the two engines (the Caterpillar engines operating the air conditioning chillers) shall not exceed 3500 hours per year. Condition B3 states that the "Maximum natural gas consumption for each engine shall not exceed 6469 cubic feet per hour". The total hours of operation for the two Worthington engines will be 3500 full load hours per year. The actual engine hours will approach 7000 hours per year. The implication of this is that the engines normally operated at less than rated capacity. This matter was discussed with your staff during the review of the permit application but was apparently overlooked during the preparation of the permit. To incorporate this operating practice as a permit condition, it is suggested that Condition B2 read, "Maximum total annual operating hours for these two engines shall not exceed 3500 full load hours per year, or 7000 actual operating hours per year". The emission limits associated with these engines can be assured by changing Condition B3 to read, "Maximum natural gas consumption per engine shall not exceed 6469 cubic feet per hour and the maximum annual natural gas consumption for the two engines shall not exceed 22.65 million cubic feet per year".

If there are any questions regarding these comments, please feel free to contact me. Thank you for considering these comments.

Very truly yours,

SHOLTES & KOOGLER,

ENVIRONMENTAL CONSULTANTS, INC.

Jøhn B. Koodler. Ph.D. P.E.

JBK: Idh

cc: Mr. Robert C. Gillander, Jr.

#### STATE OF FLORIDA

# DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



**BOB GRAHAM** GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

#### PERMITTEE:

9501 Arlington Expressway Barnett Regency Tower, Suite 1200 Jacksonville, FL 32211

Permit Number: AC 16-60981 Regency Square Properties Inc. Expiration Date: December 31, 1983 County: Duval Latitude/Longitude: 30° 19' 26"N/ 81° 32' 58"W Project: Construction of No. 5

Worthington engine and generator set; increase facility hours of operation; acquire the capability of firing 100% diesel oil

This permit is issued under the provisions of Chapter(s) 403 , Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4 . The above named permittee is hereby authorized to perform the work or operate the facility shown on 17-2 and 17-4 the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

This permit is for the construction/installation of a Worthington reciprocating engine and generator set (No. 5) and the modification of the existing facility to increase the hours of operation and to have the capability to fire 100% diesel oil as a back-up fuel in case of a natural gas shortage. The existing facility, located at the above address, has UTM coordinates of Zone 17-447.17 Km East and 3354.61 Km north.

Construction shall be in accordance with the permit application and plans amendments, documents, and drawings except as otherwise noted on pages 5-10 of the "Specific Conditions".

#### Attachments are follows:

- Jerry Woosley letter to Robert Gillander dated Aug. 26, 1982.
- Application to Construct Air Pollution Sources, DER Form 2. 17-1.122(16).
- 3. Jerry E. Woosley letter dated November 1, 1982.
- C. H. Fancy letter dated February 23, 1983.
- Robert C. Gillander letter dated December 22, 1982, received 5. March 1, 1983.
- C. H. Fancy letter dated March 16, 1983.
- John B. Koogler letter and attachments dated March 25, 1983.
- Memo to file dated May 9, 1983, by Bruce Mitchell.
- John B. Koogler letter and attachments dated May 13, 1983.
- Wayne E. Tutt letter dated June 24, 1983. 10.
- John B. Koogler letter dated July 8, 1983.

PERMITTEE:

Regency Square Properties, Inc. Permit Number: AC 16-60981

Jacksonville, FL 32211 Expiration Date: December 31, 1983

#### GENERAL CONDITIONS:

- 1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
- 2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
- 3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
- 4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
- 5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### GENERAL CONDITIONS:

- 6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.
- 7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:
  - a. Having access to and copying any records that must be kept under the conditions of the permit;
  - Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
  - c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

- 8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:
  - a. a description of and cause of non-compliance; and
  - b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:

Regency Square Properties, Inc. Permit Number: AC 16-60981

Jacksonville, FL 32211

Expiration Date: December 31, 1983

#### GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

- 9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.
- 10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
- 11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.
- 12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.
- 13. This permit also constitutes:
  - ( ) Determination of Best Available Control Technology (BACT)
  - ( ) Determination of Prevention of Significant Deterioration (PSD)
  - ( ) Compliance with New Source Performance Standards.
- 14. The permittee shall comply with the following monitoring and record keeping requirements:
  - a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.
- c. Records of monitoring information shall include:
  - the date, exact place, and time of sampling or measurements;
  - the person responsible for performing the sampling or measurements;
  - the date(s) analyses were performed;
  - the person responsible for performing the analyses;
  - the analytical techniques or methods used; and
  - the results of such analyses.
- 15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

## SPECIFIC CONDITIONS:

PERMITTEE:

Regency Square Properties Jacksonville, FL 32211

I. D. Number:

Permit Number: AC 16-60981

Expiration Date: December 31, 1983

# SPECIFIC CONDITIONS:

A. Electrical Generating Units

1. Maximum unit parameters are:

			Consumption			
	Dual		100% Diesel	<del></del>	Generating	
	<b>Gas</b>	Diesel		Brake	Capacity	BTU Per
Unit	(ft <sup>3</sup> /hr)	(gal/hr)	(gal/hr)	Horsepower	(Kilowatt)	Kilowatt
Worthingtons						
#1	12,324	4.9	80	1,900	1,250	12,000
#2	12,124	5.3	80	1,900	1,250	12,000
· #3	11,841	6.1	80	1,900	1,350	11,800
#4	17,592	5.6	120	2,452	1,750	11,500
#5	23,273	9.3	150	3,875	2,750	10,500
#6	19,183	7.4	140	2,700	2,137	11,200
Caterpillars 7 Identical						
Units	6,469	0	0	775	500	13,520

- 2. Maximum annual generating capacity for the facility shall not exceed  $56.7 \times 10^6$  kilowatts per year.
- 3. The net electrical exchange between Regency Square Properties and any outside utility is to be zero during any 12 month period.
- 4. Maximum annual hours of operation, total all electrical generating units, shall not exceed 50,979 hours per year (hrs/yr). Within this cap, the Worthington engines will be permitted to fire 100% diesel oil for 5,520 hours.

PERMITTEE:

Regency Square Properties Jacksonville, FL 32211

I. D. Number:

Permit Number: AC 16-60981

Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

5. Fuel consumption allowable limits are:

a. Diesel Oil: 761,200 gallons per year (gals/yr), maximum, if the Worthington engines operate a maximum

of 5,520 hrs/yr on 100% diesel oil

b. Diesel Oil: 184,600 gals/yr if all engines are dual fuel

fired for a maximum of 50,979 hrs/yr

c. Natural Gas: 617.6 x 106 cubic feet per year

(ft $^3$ /yr), maximum, if all engines are dual fuel fired for a maximum of 50,979

hrs/yr

d. Natural Gas:  $543.3 \times 10^6 \text{ ft}^3/\text{yr}$  if the Worthington

engines operate a maximum of 5,520 hrs/yr

on 100% diesel oil

6. Maximum allowable emission limits for each engine are:

			Max	imum Allow	able Emiss	ions	
		Dual F	uel	100%	Diesel	Natura	al Gas
Source	Pollutant	(lbs/hr)	(opacity)	(lbs/hr)	(opacity)	(lbs/hr)	(opacity)
Worthingtons							
#1	NOx	13.9		9.4			
<del>-</del>	VE		10%		<20 <del>1</del>		
# 2	NOx	22.6		9.4			
•	VE		5%		<20%		
# 3	NOx	37.9		9.5			
<b>.</b> -	VE		5%		<20%		
#4	NOx	12.0		14.7			
<b>.</b> -	VE		15%		<20%		
<del>#</del> ·5	NOx	40.5		20.1			
•	VE		10%		<20%		
#6	NOx	31.2		17.6			
" -	VE		5%		<20%		
Caterpillars	NOx		•			0.2	
(7 Identical	VE						5%
Units)							
1: <20% mean	ns "less ti	han" 20%					

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

7. Compliance tests shall be required for NOx and visible emissions (VE) and the test methods shall be DER Methods 7 and 9, respectively, in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted generating capacity.

## B. Air Conditioning Units (chillers)

# 1. Unit parameters are:

These are two identical natural gas fired Caterpillar engines rated at 775 brake horsepower each and used to drive air conditioning compressors.

- 2. Maximum total annual operating hours for the two engines shall not exceed 3500 full load hours per year.
- 3. Maximum natural gas consumption per engine shall not exceed 6.469 ft<sup>3</sup>/hr and the maximum total annual natural gas consumption for the two engines shall not exceed 22.65 x  $10^6$  ft<sup>3</sup>/yr.
- 4. Maximum allowable emission limits per engine are:

Source	Pollutant	Maximum Allo (lbs/hr)	owable Emissions (opacity)
Caterpillars (14 & 15)	NOx VE	0.2	5%

5. Compliance tests shall be required for NOx and VE and the test methods shall be DER Methods 7 and 9, respectively, in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted fuel consumption capacity.

# C. Facility

1. Maximum NOx annual allowable emissions from the entire facility are 416.7 tons per year. Compliance will be verified through the annual operating reports.

PERMITTEE:

Regency Square Properties Jacksonville, FL 32211

I. D. Number:

Permit Number: AC 16-60981

Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

2. The maximum potential pollutant emissions from the entire facility and for PSD inventory tracking are:

Pollut	tant Maximum	Total	Annual	Emissions	(TPY)
VOC CO SO <sub>2</sub> PM	l	13	4.0 <sup>2</sup> 7.5 <sup>3</sup> 3.7 <sup>3</sup> 4.5 <sup>3</sup>		

- 1: VOC stands for volatile organic carbons and represents "non-methane hydrocarbons"
- 2: 100% dual fuel firing
- 3: 80% dual fuel-20% diesel oil (100%)
- 3. Annual operating reports, by month, shall be required and must contain the hours operated and the amounts of each fuel consumed for each electrical generating unit. Also, the report shall contain all electrical exchanges between Regency Square Properties and any outside utility during the reporting year.
- 4. The applicant shall report any delays in construction and completion of this project to the DER Northeast District Office or its designee (Duval County's Bio-Environmental Services (BES)).
- 5. A Certificate of Completion shall be submitted to the DER Northeast District Office or its designee (BES) prior to receiving an operating permit. An application for an operating permit shall be submitted prior to 90 days before the expiration date of this permit. The permittee may continue to operate in compliance with all terms of this construction permit until its expiration date or the issuance of an operating permit.
- 6. Each engine will be equipped with a timer to record actual engine running time and a fuel flow meter per fuel type per engine to record the actual fuel consumption per fuel type per engine.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

SPECIFIC CONDITIONS:

Issued this /8 day of fully, 1983

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Victoria J. Aschinkel, Secretary

\_\_\_\_pages attached.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

# INTEROFFICE MEMORANDUM

For And/Or	Routing To District Offices To Other Than The Addre	1 15 <del>00</del>
To:	Loctn.:	
To:	Loctn.:	
	Loctn.:	
	Date:	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:		

TO: Victoria J. Tschinkel

FROM: Clair Fancy

DATE: July 18, 1983

SUBJ: Approval of Attached Air Construction Permit

Attached for your approval and signature is one Air Construction Permit for which the applicant is Regency Square Properties, Inc. The proposed project is for the construction of a Worthington engine and generator set (No. 5) and a facility modification at the applicant's existing facility in Jacksonville, Duval County, Florida.

The waiver date, after which the permit would be issued by default, is July 18, 1983.

The Bureau recommends your approval and signature.

CF/pa

Attachment

10		
S Form 3811, Jan. 1979	SENDER: Complete items 1, 2, and 3.  Add your address in the "RETUR" reverse.	N TO" space on
i.s	1. The following service is requested (check of	ne.)
Ξ	E) Show to whom and date delivered	
2	Show to whom, date and address of d	
;- 	☐ RESTRICTED DELIVERY	
979	Show to whom and date delivered	
	☐ RESTRICTED DELIVERY.	•
	Show to whom, date, and address of a	ieliyer <b>y S</b>
•		
	(CONSULT POSTMASTER FOR FE	<b>ES</b> )
	2 ARTICLE ADDRESSED TO:	
3	Mr. Robert C. Gilland	er, Jr.
₫	9501 Arlington Expres	
Z	Jacksonville, FL 3221	
2		<u> </u>
20		NSURED NO.
RSTURN RECEIPT	ACOISTERED ING.	ASONED NO.
•	P408530330	•
REGISTERED, INSURED	(Always obtain signature of addressee	or agent)
371	I have received the article described above.	
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P 408 530 330

RECEIPT FOR CETT, FIED MANA

NO INSURANCE DOVERAGE PROVIDES— NOT FOR INTERNATIONAL MAIL

(See Reverse)

1238 16370.007	
Sent to Robert C. Gilland	der, J
Street and No. 9501 Arlington E	xpress
P.O., State and ZIP Code Jacksonville, FL	32211
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date	
TOTAL Postage and Fees Postmark or Date 7/21/83	

SKEC 258-81-01

July 8, 1983

The state of the s

Mr. Clair H. Fancy W.D. Chief Bureau of Air Quality Management Florida Department of Environmental Regulation 2600 Blair Stone Road Tallahassee, Florida 32301 DER
JUL 11 1983
BAOM

Subject:

Regency Square Properties, Inc.

Permit No. AC16-60981

Duval County

Dear Mr. Fancy:

I would like to comment on three of the specific conditions contained in the subject Air Pollution Source Construction Permit for purposes of clarifying the conditions. The specific conditions which I will address are Condition A3 on Page 6 of the permit and Condition B2 and B3 on Page 8 of the permit.

Condition A3- The condition states "The net electrical exchange between Regency Square Properties, Inc. and any outside utility is to be zero during any 12 month period." It is the intention of Regency Square Properties that the net exchange of electrical power with outside utilities be zero. Due to practical considerations, however, there are periods of time when this exchange might not balance to zero; the exchange could either be positive or negative over a 12 month period. The exchange could be negative (that is, Regency Square Properties would receive more power than they supplied) if Regency Square Properties had an unscheduled shutdown of one of the larger Worthington generator units and had to purchase more power than anticipated. The exchange could be positive if Regency Square, in anticipation of a major overhaul, supplies excess power to the outside utility so that the "banked" excess power could be drawn against during the time of the schedule overhaul.

(3)

(4)

(5)

As stated previously, it is the intention of Regency Square Properties for the net electric power exchange be zero. Over a period of several years, this exchange will be zero or very close to zero. The Department should understand, however, that due to practical considerations of operating the Total Energy Plant, there may be 12 month periods when that electric power exchange is other than zero.

Conditions B2 and B3- Condition B2 states, "Maximum total annual operating hours for the two engines (the Caterpillar engines operating the air conditioning chillers) shall not exceed 3500 hours per year". Condition B3 states that the "Maximum natural gas consumption for each engine shall not exceed 6469 cubic feet per hour". The total hours of operation for the two Worthington engines will be 3500 full load hours per year. The actual engine hours will approach 7000 hours per year. The implication of this is that the engines normally operated at less than rated capacity. This matter was discussed with your staff during the review of the permit application but was apparently overlooked during the preparation of the permit. To incorporate this operating practice as a permit condition, it is suggested that Condition B2 read, "Maximum total annual operating hours for these two engines shall not exceed 3500 full load hours per year, or 7000 actual operating hours per year". The emission limits associated with these engines can be assured by changing Condition B3 to read, "Maximum natural gas consumption per engine shall not exceed 6469 cubic feet per hour and the maximum annual natural gas consumption for the two engines shall not exceed 22.65 million cubic feet per year".

If there are any questions regarding these comments, please feel free to contact me. Thank you for considering these comments.

Very truly yours,

SHOLTES & KOOGLER,

ENVIRONMENTAL CONSULTANTS, INC.

Ønn B. Kooglør, Ph.D., P.E.

JBK: Idh

cc: Mr. Robert C. Gillander, Jr.

cc: Mr. Doug Dutton - DER

cc: Mr. R. Gillander

# DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES

Bio-Environmental Services Division Air and Water Pollution Control

June 24, 1983

Mr. Bill Thomas, Engineer
Bureau of Air Quality Management
Fla. Dept. of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32301

DER JUN 28 1983

BAQM

Re: Regency Square Properties Worthington Engine No. 5

Dear Mr. Thomas:

This Office has reviewed the technical evaluation and preliminary determination prepared on the referenced source, and offers the following comments -

- (1) Specific Condition A. 7. identifies compliance test methods for NO, and visible emissions, however nowhere is there a requirement that compliance tests be conducted. This testing is not optional, but is very clearly required pursuant to Section 17-2.700(2)(a)1 to wit - "The owner or operator of a new or modified source that is subject to an emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining an Operation Permit for such source." The maximum allowable  $NO_X$  emission limit for engine number 5, given in the table in Condition No. 6, is based upon measured emissions taken on engine number 6, however engine number 5 has never been tested. It is our opinion that pursuant to 17-2.700(2)(a)1 above,  $NO_{\rm X}$  and V.E. tests must be done on number 5, and the  $NO_X$  must be less than or equal to 664 PPMV, the measured value of engine no. 6.
- (2) It is noted that there is a proposed NSPS for stationary internal combustion engines, designated Title 40, Part 60, Subpart FF, Code of Federal Regulations. The proposed standard was published July 23, 1979 in the Federal Register, and the proposed applicability is such that if a final rule is published, this engine will be an affected source. It is further noted that the proposed NO<sub>X</sub> emission limit is 600 PPMV for a duel fuel engine, and this standard, if promulgated unchanged, would constitute a restricting of emission limits as allowed in this permit.

Please advise this Agency as to the Department's final position on this matter.

Very truly yours. Warne E. Tul

Wayne E. Tutt Associate Engineer

WET/vj



(1)

(2)

AREA CODE 904 / AIR POLLUTION — 633-3033 OR 633-3303 / WATER POLLUTION — 633-3415 515 WEST 6TH STREET / JACKSONVILLE, FLORIDA 32206-4397

Regency Square Properties, Inc.

Post Office Box 2718 Jacksonville, Florida 32232-0033

Telephone 904-725-9272

June 16, 1983

Mr. C.H. Fancy, P.E.
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

DER

JUN 201983

BAQM

Re: Regency Square Properties, Inc.

Total Energy Plant

Dear Mr. Fancy:

Enclosed you will find the original proof of running sent to us by the Times Union verifying the Notice of Proposed Agency Action which was run in the paper on June 15th.

This is in accordance with your letter to Robert Gillander dated June 10, 1983.

Sincere 17

Susan M. Gramling

Administrative Assistant

/sig

Enc.

cc: John B. Koogler, Ph.D., P.E.

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### 150 PUBLIC NOTICES

TIMES:000 /: 1 PAID:

PROPOSED AGENCY ACTION

The Department of Environmental Regulation gives notice of its Intent to Issue a permit to Resency Square Properties for the construction/installation of a Worthington reciprocating engine and generators et (No. 5) at their existing facility in Jackson-ville, Duval Country, Florida. The facility is also being modified by increasing hours of operation and acquiring the capability to itself to the control of the 10% diesel oil as a back-up tivel in case of a natural gas shortage. A determination of Best Available Control Technology (BACT) was not required.

A person who is substantially at fected by the Department's proposed permitting decision may request a hearing in accordance with Section 120.57, Florida Siautes, and Chapters 17-1 & 28-5. Florida Administrative Code. The seauest for hearing must be filed (received) in the Office of General Counsel of the Department of Code of Code of the C

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DER Bureau Of Air Quality Management 2600 Blair Stone Road Tallahassee, Florida 32301

DER Northeast District 3426 Bills Road Jacksanville, Florida 32207

Duval County Division of Bio-Environmental Services 515 West 6th Street Jacksanville, Florida 32206

Comments on this action shall be submitted in writing to Bill Thomas of Tallahassee office within thirty (30) days of this notice. RECEIVED

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Phone: 904/725-9272 SORT: NOTICEOFPR AD: 0006361 ID: REGERCY

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8:00 a.m. to 5:00 p.m., Monday through Friday, except legal nol(m\*)

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Tallahassee, Florida 32301(qc)

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#### STATE OF FLORIDA

## DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING. 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

June 10, 1983

#### CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Robert C. Gillander, Jr. Executive Vice-President Regency Square Properties 9501 Arlington Expressway Jacksonville, Florida 32211

Dear Mr. Gillander:

Attached is one copy of the Technical Evaluation and Preliminary Determination, and proposed permit for the the construction/installation of a Worthington reciprocating engine and generator set (No. 5) at your existing facility in Jacksonville, Duval County, Florida.

Before final action can be taken on your proposed permit, you are required by Florida Administrative Code Rule 17-1.62(3) to publish the attached Notice of Proposed Agency Action in the legal advertising section of a newspaper of general circulation in Duval County no later than fourteen days after receipt of this letter. The department must be provided with proof of publication within seven days of the date the notice is published. Failure to publish the notice will be grounds for denial of the permits.

The Preliminary Determination and proposed permit constitute a proposed action of the department and are subject to administrative hearing under the provisions of Chapter 120, Florida Statutes, if requested within fourteen days from receipt of this letter. Any petition for hearing must comply with the requirements of Florida Administrative Code Rule 28-5.201 and be filed with the Office of General Counsel, Florida Department of Environmental Regulation, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to file a request for hearing within fourteen days shall constitute a waiver of your right to a hearing. Filing is deemed complete upon receipt by the Office of General Counsel.

Mr. Robert C. Gillander, Jr. June 10, 1983 Page Two

Please submit, in writing, any comments which you wish to have considered concerning the department's proposed action to Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

C. H. Fancy, P.E.

Deputy Chief Bureau of Air Quality Management

CHF/BM/pa

Attachments

cc: Dr. John B. Koogler, P.E., Sholtes and Koogler Environmental Consultants

Mr. Doug Dutton, DER Northeast District

Mr. Jerry Woosley, Duval County Bio-Environmental Services Division

# Technical Evaluation and Preliminary Determination

Regency Square Properties
Jacksonville
Duval County, Florida
No. 5 Worthington Gas/Diesel Engine: 3875 hp
No. 5 Worthington Generator: 2750 kw
Facility Modification

Permit Number: State: AC 16-60981

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

#### NOTICE OF PROPOSED AGENCY ACTION

The Department of Environmental Regulation gives notice of its intent to issue a permit to Regency Square Properties for the construction/installation of a Worthington reciprocating engine and generator set (No. 5) at their existing facility in Jacksonville, Duval County, Florida. The facility is also being modified by increasing hours of operation and acquiring the capability to fire 100% diesel oil as a back-up fuel in case of a natural gas shortage. A determination of Best Available Control Technology (BACT) was not required.

A person who is substantially affected by the Department's proposed permitting decision may request a hearing in accordance with Section 120.57, Florida Statutes, and Chapters 17-1 and 28-5, Florida Administrative Code. The request for hearing must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request a hearing under Section 120.57, Florida Statutes.

The application, technical evaluation and department intent are available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the following locations:

DER Bureau of Air Quality Management 2600 Blair Stone Road Tallahassee, FL 32301

DER Northeast District 3426 Bills Road Jacksonville, Florida 32207

Duval County Division of Bio-Environmental Services 515 West 6th Street Jacksonville, Florida 32206

Comments on this action shall be submitted in writing to Bill Thomas of Tallahassee office within thirty (30) days of this notice.

# RULES OF THE ADMINISTRATIVE COMMISSION MODEL RULES OF PROCEDURE CHAPTER 28-5 DECISIONS DETERMINING SUBSTANTIAL INTERESTS

#### 28-5.15 Requests for Formal and Informal Proceedings

- (1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.
- (2) All petitions filed under these rules should contain:
  - (a) The name and address of each agency affected and each agency's file or identification number, if known;
  - (b) The name and address of the petitioner or petitioners;
  - (c) All disputed issues of material fact. If there are none, the petition must so indicate;
  - (d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;
  - (e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;
  - (f) A demand for the relief to which the petitioner deems himself entitled; and
  - (g) Such other information which the petitioner contends is material.

#### I. PROJECT DESCRIPTION

#### A. Applicant

Regency Square Properties Barnett Regency Tower, Suite 1200 Jacksonville, Florida 32211

#### B. Project Description and Location

The applicant proposes to construct/install a sixth Worthington reciprocating engine (No.5) to supplement the existing generating plant. Also, a Worthington generator (No. 5) will be installed. The engine will be capable of producing 3,875 brake horsepower (hp) and the generating capacity of the generator will be 2750 kilowatts (KW). The engine will be fired with natural gas and diesel oil (dual fuel) as the primary fuel and 100% diesel oil (No. 2) as a stand-by fuel in case of a natural gas shortage.

Besides the installation of the new engine and generator set, the applicant proposes to modify the existing facility by increasing the total hours of operation and by having the capability of firing 100% diesel oil. The Caterpillar engines are not set up to fire diesel oil.

The proposed modification/installation will occur at the existing facility location, 9501 Arlington Expressway, Jacksonville, Duval County, Florida. The UTM coordinates are Zone 17-447.170 km East and 3354.610 km North.

#### C. Process and Controls

Currently there are five Worthington duel fuel/diesel oil fired reciprocating engines (Nos. 1-4,6) driving Worthington generators (Nos.1-4,6) and seven natural gas fired Caterpillar reciprocating engines (Nos.7-13) driving electric power generators. In addition, there are two natural gas fired Caterpillar reciprocating engines (Nos. 14,15) which drive air conditioning chiller compressors. The total electric power generating capacity of these existing units is 11,237 KW.

The proposed modification and the existing units will yield a total electric power generating capacity of 13,987 KW. The following table (Table 1) will summarize the existing facility's equipment and includes the proposed No. 5 Worthington engine.

Dual fuel firing means that the Worthington engines consume both natural gas and diesel oil at the same time. The mixture ratio is usually 95:5, natural gas to diesel oil, with a maximum of 94:6. These engines are not designed to fire natural gas only. However, they can operate on 100 percent (%) diesel oil.

TABLE 1

SUMMARY OF EQUIPMENT AT REGENCY SQUARE PROPERTIES

TOTAL ENERGY PLANT

JACKSONVILLE, FLORIDA

Unit	Engine Manufacturer	Brake HP Rating	KW Rating	(l) Fuel
1	Worthington	1,900	1,250	dual/diesel
2	Worthington	1,900	1,250	
3	Worthington	1,900	1,350	
4	Worthington	2,452	1,750	
(2) 5	Worthington	3,875	2,750	
6	Worthington	2,700	2,137	
7-13	Caterpillar	775 each	500 each	gas
-15	Caterpillar	775 each		gas

<sup>(1)</sup> dual fuel means natural gas and diesel oil being fired together in a ratio of usually 95:5, maximum 94:6.

<sup>(2)</sup> proposed modification

<sup>(3)</sup> these engines drive air conditioning chiller compressors only

The only controls associated with this energy plant are crew efficiency and keeping the engines finely tuned. Higher temperature combustion increases the  $\mathrm{NO}_{\mathrm{X}}$  (nitrogen oxides) emissions, but decreases CO (carbon monoxide) emissions. Decreasing the combustion temperature will cause the opposite effect.

#### II. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapters 17-2 and 17-4, Florida Administrative Code (FAC).

Regency Square Properties (RSP) is located in the Duval County Nonattainment Area for the pollutant ozone (O<sub>3</sub>) in accordance with Chapter 17-2.410(1)(a)3., FAC. RSP is also located in the area of influence of the Duval County Particulate Matter Nonattainment Area in accordance with Chapter 17-2.100(14), FAC. Therefore, the proposed modification will be reviewed in accordance with Chapter 17-2.510, FAC, New Source Review for Nonattainment Areas and Chapter 17-2.500, FAC, Prevention of Significant Deterioration (PSD).

The following table (Table 2) reflects the Regency Square Properties baseline pollutant emissions, in tons per year (TPY), and projects the modification's pollutant emissions by the addition of the No. 5 Worthington set plus the increased hours of operation and fuel consumption of the existing engines (Worthingtons and Caterpillars):

Table 2
Regency Square Properties

Engines		Base	eline Pollu	tant Emis	sions (TP	Y) I
		PM	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO
Worthington	1	0.2	0.2	19.9	1.3	7.2
, , , , , , , , , , , , , , , , , , ,	2	0.3	0.3	39.0	1.4	8.6
	3	0.4	0.3	62.4	2.0	8.3
	4	0.2	0.2	10.2	0.7	6.2
	6	0.3	0.3	35.1	1.9	9.4
Caterpillar	7-15	<<0.1 <sup>3</sup>	<<0.1	0.7	0.4	9.3
	Total	: 1.4	1.3	167.3	7.7	49.0
	Mo	dificati	on Polluta	nt Emissi	ons (TPY)	2
		PM	SO <sub>2</sub> _	NO <sub>x</sub>	VOC _	CO
Modification	Total:	13.1	12.3	249.4	15.4	98.5

<sup>1:</sup> based on March, 1982, Sholtes and Koogler stack test results (NO $_{\rm X}$  and VOC), AP-42 Emission Factors (PM, SO $_{\rm 2}$ , CO), and the permitted maximum allowed hours of operation (23,379)

According to the baseline values, the RSP emits 167.3 TPY of the pollutant  $NO_X$ , which by definition is a major facility in accordance with Chapter 17-2.100(95), FAC. Because this type of facility is not on the list contained in Chapter 17-2, Table 500-1, FAC, Major Facility Categories, and PM and VOC emissions are not equal to or greater than 100 TPY, then emissions of any other criteria pollutant must be equal to or greater than 250 TPY before being subject to new source review pursuant to Chapter 17-2.500, FAC, PSD. Therefore, the existing facility is a major facility and review shall be in accordance with Chapters 17-2.510(2)(d)4. and 17-2.500(2)(d)4., FAC, Modifications to Major Facilities.

<sup>2:</sup> the emissions represent the highest expected pollutant emissions from firing dual fuel or 100% diesel oil; based on the same emission factors established for baseline calculations

<sup>3: &</sup>lt;<0.1 means "much less than" 0.1

Since the potential emissions from the proposed modifications are less than 250 TPY for the pollutants CO,  $SO_2$  and  $NO_X$ , and less than 100 TPY for the pollutants VOC and PM, the proposed project would be a minor modification to a major facility and not subject to the provisions of Chapters 17-2.510(4) and 17-2.500(5), FAC, Preconstruction Review Requirements, in accordance with Chapters 17-2.510(2)(d)4.b. and 17-2.500(2)(d)4.b., FAC, respectively.

Even though this proposed project is a minor modification to a major facility and will be potentially emitting 417 TPY of the pollutant  $NO_X$ , any future modification that would result in a significant net emissions increase of any pollutant, as set forth in Chapter 17-2.500(2)(e)2., FAC, the RSP will be subject to Chapters 17-2.500(5) and/or 17-2.510(4), FAC.

The applicant used emission factors for the pollutant  ${
m NO}_{
m X}$  for each engine that were established through stack tests performed by Sholtes and Koogler, Environmental Consultants, Inc. The tests were conducted in March, 1982. By using these engine specific emission factors, the baseline and the modified facility's  $NO_{\mathbf{X}}$  emissions were calculated and the facility was able to avoid both state and federal Prevention of Significant Deterioration review. It is noted that the emissions calculated using the applicant's emission factors are considerably lower than emissions estimated using AP-42 Emission Factors. bureau will accept these engine specific emission factors and permit the  $\mathrm{NO}_{\mathbf{x}}$  allowable limits based on these emission factors. Also, the visible emission (VE) limits requested by the applicant when firing dual fuel and natural gas are acceptable by the bureau and will become a part of the permit's "specific conditions". VE limits when firing 100% diesel oil shall be in accordance with Chapter 17-2.610(2), FAC, General Visible Emissions Standard.

The proposed project will also be permitted in accordance with Chapter 17-2.620(2), FAC, General Pollutant Emission Limiting Standards-Objectionable Odor Prohibited. According to this section, no person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance according to Chapter 17-2.100(108), FAC.

#### III. SUMMARY OF EMISSIONS AND AIR QUALITY ANALYSIS

#### A. Emission Limitations

The regulated pollutant emissions from the modified facility are  $\mathrm{NO}_{\mathrm{X}}$  and visible emissions (VE) in accordance with Chapter 17-2.510, FAC, Chapter 17-2.610(2), FAC, and what the applicant has requested as limits (based on tests performed at the RSP facility). Table 3 reflects the  $\mathrm{NO}_{\mathrm{X}}$  emission rates established from stack tests performed by Sholtes and Koogler, Environmental Consultants, Inc., in March, 1982. Table 4 exhibits the maximum VE limits allowed for each engine, by fuel type fired, and were established from VE tests performed by Sholtes and Koogler in March, 1982, and from the application of Chapter 17-2.610(2), FAC. Table 5 reflects the maximum  $\mathrm{NO}_{\mathrm{X}}$  allowable emissions for the modified facility.

The permitted emissions are in compliance with all applicable requirements of Chapter 17-2, FAC.

#### B. Air Quality Impacts

From a technical review of the application and its amendments, the bureau has determined that the modifications to the existing facility will not have an impact on Florida's ambient air quality standards.

Table 3

		NO <sub>x</sub> Emission Ra	te (lbs/hr)	
Engine	Dual	Diesel <sup>1</sup>	Natural Gas	
1	13.9	9.4		
2	22.6	9.4		
3	37.9	9.5		
4	12.0	14.7		
<sub>5</sub> 2 ,	40.5	20.1		
6	31.2	17.6		
Caterpillars (7-15)3			0.2	

Maximum diesel oil consumption per engine (gals/hr) 1: #5 - 150 #6 - 140 #1 - 80 #3 - 80

#2 - 80

#4 - 120

- No. 5 engine emission rates are based on No. 6 for dual and No. 4 for diesel.
- Emission rate is for only one Caterpillar. 3:

Visible Emissions

# Maximum Allowable Emission Limit (opacity)

Engine	Dual	Diesel	Natural Gas
1	10%	<20%2	
2	5%	<20%	
3	5%	<20%	
4	15%	<20%	
5	10%	<20%	
6	5%	<20%	
Caterpillars <sup>1</sup> (7-15)			5%

Table 4

<sup>1:</sup> Emission limit is for each Caterpillar

<sup>2: &</sup>lt;20% means "less than" 20%

	. · · · ·	Maximum Allowable Emissions (TPY)
Scenario	Sources	NO <sub>x</sub>
Permitted (Actual)		167.3 <sup>1</sup>
Dual Fuel 100%	6 Worthingtons 7 Caterpillars 2 Caterpillars(chiller	248.4 0.8 sal: 0.2 416.72
Dual 80% - Diesel 20%	6 Worthingtons 7 Caterpillars 2 Caterpillars(chiller Tot	$ \begin{array}{r} 237.7 \\ 0.6 \\ 0.2 \\ 405.82 \end{array} $

- 1: Based on Sholtes and Koogler emission factors, fuel consumptions per hour per engine, and the permitted hours of operation (23,379).
- 2: See Table 4 in the data submitted May 13, 1983, by John B. Koogler of Sholtes and Koogler, Environmental Consultants, Inc.

#### IV. CONCLUSIONS

The  ${\rm NO_X}$  emission rates and visible emission limits established for each engine through stack tests and proposed by the applicant are acceptable by the bureau. However, it is still noted that the emission rates are lower than the AP-42 Emissions Factors.

The only controls associated with the sources are crew efficiency and keeping the engines finely tuned. Therefore, annual reports, by month, containing amounts of fuels consumed by engine, hours of operation by engine, and total facility electricity generated (KW) will be required. Also, the report must contain the monthly amounts of electricity exchanged between Regency Square Properties and any outside utility during the reporting year, because the net electrical exchange is to be zero. The reports shall be filed with the DER Northeast District Office or its designee (Duval County's Bio-Environmental Services).

The permitted maximum allowable emissions for the pollutant  ${\tt NO}_{\bf X}$  will not cause any violation of Florida's ambient air quality standards.

The General and Specific Conditions listed in the proposed permit (attached) will assure compliance with all applicable requirements of Chapter 17-2, FAC.

#### STATE OF FLORIDA

## DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

#### PERMITTEE:

9501 Arlington Expressway Barnett Regency Tower, Suite 1200 Jacksonville, FL 32211

Permit Number: AC 16-60981 Regency Square Properties Inc. Expiration Date: December 31, 1983 County: Duval 30° 19' 26"N/ Latitude/Longitude: 81° 32' 58"W Project: Construction of No. 5 Worthington engine and generator set; increase facility hours of operation; acquire the capability of firing 100% diesel oil

This permit is issued under the provisions of Chapter(s) 403 , Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4 The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

This permit is for the construction/installation of a Worthington reciprocating engine and generator set (No. 5) and the modification of the existing facility to increase the hours of operation and to have the capability to fire 100% diesel oil as a back-up fuel in case of a natural gas shortage. The existing facility, located at the above address, has UTM coordinates of Zone 17-447.17 Km East and 3354.61 Km north.

Construction shall be in accordance with the permit application and plans amendments, documents, and drawings except as otherwise noted on pages 5-10 of the "Specific Conditions".

#### Attachments are follows:

- Jerry Woosley letter to Robert Gillander dated Aug. 26, 1982.
- Application to Construct Air Pollution Sources, DER Form 17-1.122(16) and accompanying letter from John B. Koogler dated September 27, 1982.
- Jerry E. Woosley letter dated November 1, 1982. 3.
- C. H. Fancy letter dated February 23, 1983. 4.
- Robert C. Gillander letter dated December 22, 1982, received March 1, 1983.
- C. H. Fancy letter dated March 16, 1983. 6.
- John B. Koogler letter and attachments dated March 25, 1983. 7.
- Memo to file dated May 9, 1983, by Bruce Mitchell.
- John B. Koogler letter and attachments dated May 13, 1983.

PERMITTEE:

Regency Square Properties, Inc. Permit Number: AC 16-60981

Jacksonville, FL 32211 Expiration Date: December 31, 1983

#### **GENERAL CONDITIONS:**

- 1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
- 2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
- 3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
- 4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
- 5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### **GENERAL CONDITIONS:**

- 6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.
- 7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:
  - a. Having access to and copying any records that must be kept under the conditions of the permit;
  - b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit;
  - c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

- 8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:
  - a. a description of and cause of non-compliance; and
  - b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:

Regency Square Properties, Inc. Permit Number: AC 16-60981

Jacksonville, FL 32211

Expiration Date: December 31, 1983

#### GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

- 9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.
- 10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
- 11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.
- 12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.
- 13. This permit also constitutes:
  - ( ) Determination of Best Available Control Technology (BACT)
  - ( ) Determination of Prevention of Significant Deterioration (PSD)
  - ( ) Compliance with New Source Performance Standards.
- 14. The permittee shall comply with the following monitoring and record keeping requirements:
  - a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### **GENERAL CONDITIONS:**

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.
- c. Records of monitoring information shall include:
  - the date, exact place, and time of sampling or measurements;
  - the person responsible for performing the sampling or measurements;
  - the date(s) analyses were performed;
  - the person responsible for performing the analyses;
  - the analytical techniques or methods used; and
  - the results of such analyses.
- 15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

#### SPECIFIC CONDITIONS:

#### **BEST AVAILABLE COPY**

PERMITTEE:

Regency Square Properties Jacksonville, FL 32211

I. D. Number:

Permit Number: AC 16-60981

Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

A. Electrical Generating Units

1. Maximum unit parameters are:

	M	aximum Fuel	Consumption			
	Dual		100% Diesel		Generating	
	Gas	Diesel		Brake	Capacity	BTU Per
Unit	(ft <sup>3</sup> /hr)	(gal/hr)	(gal/hr)	Horsepower	(Kilowatt)	Kilowatt
√orthingtons						
#1	12,324	4.9	80	1,900	1,250	12,000
#2	12,124	5.3	80	1,900	1,250	12,000
#3	11,841	6.1	80	1,900	1,350	11,800
#4	17,592	5.6	120	2,452	1,750	11,500
# <b>5</b>	23,273	9.3	150	3,875	2,750	10,500
#6	19,183	7.4	140	2,700	2,137	11,200
aterpillars 7 Identical						
hits	6,469	0	0	775	500	13,520
		•				

- 2. Maximum annual generating capacity for the facility shall not exceed  $56.7 \times 10^6$  kilowatts per year.
- 3. The net electrical exchange between Regency Square Properties and any outside utility is to be zero during any 12 month period.
- 4. Maximum annual hours of operation, total all electrical generating units, shall not exceed 50,979 hours per year (hrs/yr). Within this cap, the Worthington engines will be permitted to fire 100% diesel oil for 5,520 hours.

#### **BEST AVAILABLE COPY**

PERMITTEE:

Regency Square Properties Jacksonville, FL 32211

I. D. Number:

Permit Number: AC 16-60981

Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

- 5. Fuel consumption allowable limits are:
  - a. Diesel Oil: 761,200 gallons per year (gals/yr), maximum, if the Worthington engines operate a maximum of 5,520 hrs/yr on 100% diesel oil
  - b. Diesel Oil: 184,600 gals/yr if all engines are dual fuel fired for a maximum of 50,979 hrs/yr
  - c. Natural Gas: 617.6 x 10<sup>6</sup> cubic feet per year (ft<sup>3</sup>/yr), maximum, if all engines are dual fuel fired for a maximum of 50,979 hrs/yr
  - d. Natural Gas: 543.3 x 10<sup>6</sup> ft<sup>3</sup>/yr if the Worthington engines operate a maximum of 5,520 hrs/yr on 100% diesel oil
- 6. Maximum allowable emission limits for each engine are:

			Max:	imum Allow	able Emiss:	ions	
		Dual F	uel	100%	Diesel	Natura	al Gas
ource	Pollutant	(lbs/hr)	(opacity)	(lbs/hr)	(opacity)	(lbs/hr)	(opacity)
%orthingtons							
#1	NOx	13.9		9.4			
	VE		10%		<20% <sup>1</sup>		
# 2	NOx	22.6		9.4			
	VE		5%		<20%		
#3	NOx	37.9		9.5			
	VE		5%		<20%		
#4	NOx	12.0	,	14.7			
	VE		15%		<20%		
#5	NO x	40.5		20.1			
	VE		10%		<20%		
#6	NOx	31.2		17.6			
	VE		5%		<20%		
:aterpillars	NOx					0.2	
<pre>(7 Identical</pre>	VE						5%
Units)							

L: <20% means "less than" 20%</pre>

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

7. Compliance tests to verify the above NOx emission limits shall be DER Method 7 in accordance with Chapter 17-2.700, FAC. Compliance tests for visible emissions (VE) shall be DER Method 9 in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted capacity.

#### B. Air Conditioning Units (chillers)

1. Unit parameters are:

These are two identical natural gas fired Caterpillar engines rated at 775 brake horsepower each and used to drive air conditioning compressors.

- 2. Maximum total annual operating hours for the two engines shall not exceed 3500 hours per year.
- 3. Maximum natural gas consumption per engine shall not exceed 6,469 ft<sup>3</sup>/hr.
- 4. Maximum allowable emission limits per engine are:

Source	Pollutant	Maximum All (lbs/hr)	owable Emissions (opacity)
Caterpillars (14 & 15)	NOx VE	0.2	5%

<sup>5.</sup> Compliance tests shall be DER Method 7 for NOx emissions and in accordance with Chapter 17-2.700, FAC. Visible emissions (VE) tests shall be DER Method 9 and in accordance with Chapter 17-2.700, FAC. Compliance tests shall be conducted with the engine operating at 90-100% of the maximum permitted capacity.

#### C. Facility

1. Maximum NOx annual allowable emissions from the entire facility are 416.7 tons per year. Compliance will be verified through the annual operating reports.

PERMITTEE:
Regency Square Properties
Jacksonville, FL 32211

I. D. Number:
Permit Number: AC 16-60981
Expiration Date: December 31, 1983

#### SPECIFIC CONDITIONS:

2. The proposed maximum pollutant emissions from the entire facility and for PSD inventory tracking are:

Pollutant Pollutant	Maximum Total Annual Emissions	(TPY)
vocl	24.0 <sup>2</sup>	
CO	$\begin{array}{c} 24.0^{2} \\ 147.5^{3} \end{array}$	
SO <sub>2</sub>	13.73	
PM T	14.53	

- 1: VOC stands for volatile organic carbons and represents "non-methane hydrocarbons"
- 2: 100% dual fuel firing
- 3: 80% dual fuel-20% diesel oil (100%)
- 3. Annual operating reports, by month, shall be required and must contain the hours operated and the amounts of each fuel consumed for each electrical generating unit. Also, the report shall contain all electrical exchanges between Regency Square Properties and any outside utility during the reporting year.
- 4. The applicant shall report any delays in construction and completion of this project to the DER Northeast District Office or its designee (Duval County's Bio-Environmental Services (BES)).
- 5. A Certificate of Completion shall be submitted to the DER Northeast District Office or its designee (BES) prior to receiving an operating permit. An application for an operating permit shall be submitted prior to 90 days before the expiration date of this permit. The permittee may continue to operate in compliance with all terms of this construction permit until its expiration date or the issuance of an operating permit.

page 9 of 10

PERMITTEE:

I. D. Number: Regency Square Properties Permit Number: AC 16-60981

Jacksonville, FL 32211 Expiration Date: December 31 Expiration Date: December 31, 1983

SPECIFIC CONDITIONS:

Issued	this_	day	of_		198	3
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#### STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Victoria	J.	Tschinkel,	Secretary

pages attached.

page 10 of 10

ATTACHMENT 1

28 Farm	SENDER: Complete items 1, 2, and 3. Add your eddress in the "RETURN TO" space on reverse.
3911, Jan. 1979 .	1. The following service is requested (check one.)  Show to whom and date delivered
	(CONSULT POSTMASTER FOR FEES)
]	2. ARTICLE ACCINESSED TO:
RETURN RECEIPT, REGISTERED,	Mr. Robert C. Gillander, Jr. 9501 Arlington Expressway Jacksonville, FL 32211
RECEIPT,	3. ARTICLE DESCRIPTION: REGISTERED NO.   INSURED NO.   INSURED NO.
R	<u>\$408530323</u>
315	(Always obtain signature of addressee or agent)
TE	I have received the article described above.
6	SIGNATURE DAddressee DAuthorized agent
35	Sheni E. King
INSURED AI	DATE OF DELIVERY POSTBURK
AND	4
	DATE OF DELIVERY POSTBURK

P 408 530 323

RECEIPT FOR CERTIFIED MAIL

40 INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to		
Robert C. Gillander		
Street and No.		
P.O., State and ZIP Code		
Postage	\$	
-	i .	
Certified Fee	;	
Special Delivery Fee		
Restricted Delivery Fee		
Hestificial Delivery 1 de		
Return Receipt Snowing	,	
to whom and Dete Delivered		
Return Receipt Showing to whom,		
Date, and Address of Delivery		
TOTAL Postage and Fees	\$	
Postmark or Date		

PS Form 3800, Feb. 1982

6/10/83

#### STATE OF FLORIDA

## DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



**BOB GRAHAM** VICTORIA J. TSCHINKEL SECRETARY

May 17, 1983

Mr. James T. Wilburn, Chief Air Management Branch Air & Waste Management Division U. S. EPA, Region IV 345 Courtland Street, N.E. Atlanta, Georgia

Dear Mr. Wilburn:

Regency Square Properties Modification Request RE: PSD-FL-092

The Bureau of Air Quality Management received a PSD permit application, referenced above, on October 1, 1982, for which you were copied.

The original application established a baseline emission of 257 TPY for the pollutant NOx, the criteria pollutant emitted the most. Revised information and calculations submitted from the applicant establishes the  $NO_{\mathbf{X}}$  baseline emissions to be 167.3 TPY and therefore, less than 250 TPY emissions and not subject to PSD. Also, the modification request is such that it will be a less than 250 TPY increase of any pollutant and consequently, not subject to PSD. However, the baseline emissions plus the modification request will make the Regency Square Properties major for the pollutant  $NO_{\mathbf{x}}$  by exceeding 250 TPY and will be subject to both federal and state PSD on the next significant net emissions increase of any pollutant.

If there are any questions, please write to me at the above address or call me at (904) 488-1344.

Sincerely,

C. H. Fancy, P. E.

Deputy Chief

Bureau of Air Quality

Management.

CHF/RBM/bjm -

Robert C. Gillander, Jr., Regency Square Properties Nancy Wright, General Counsel DER Northeast District Protecting Florida and Your Quality of Life

#### STATE OF FLORIDA

### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 1230

NOTARY PUBLIC, STATE OF FLORIDA My commission expires July 5, 1985

Effective November 30, 1982

DER Form 17-1.201(8)



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

JUN 15 1983

BAQM

Applicant's Name:

#### WAIVER OF 90 DAY TIME LIMIT UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully

REGENCY SQUARE PROPERTIES. INC.

License (Permit, Certification) Application No. PSD-FL-092

understands the applicant's rights under th	nat section.
applicant hereby with full knowledge and under Sections 120.60(2) and 403.0876, Flotions 120.60(2) and 403.0876, Florida Stadenied by the State of Florida Department of time period prescribed in Sections 120.60 waiver is made freely and voluntarily by tinterest, and without any pressure or co	se (permit, certification) application, the understanding of (his) (her) (its) rights orida Statutes, waives the right under Sectutes, to have the application approved or find Environmental Regulation within the 90 day (2) and 403.0876, Florida Statutes. Said he applicant, is in (his) (her) (its) selfercion by anyone employed by the State of
Florida Department of Environmental Regulat	ion.
This waiver shall expire on the 18 day  The undersigned is authorized to make this	•
The diddersigned as a great to make this	MHALL
OF FEWERER	Signature
,	ROBERT C. GILLANDER, JR.
Sworn to and subscribed	Please Type Name of Signee
before me this $1446$ day of $1983$ .	6/14/83
	Date
Marlene Haddork	

Page 1 of 2

SKEC 258-81-01

May 13, 1983

Mr. Bruce Mitchell Florida Department of Environmental Regulation Twin Towers Office Building 2600 Blair Stone Road Tallahassee, Florida 32301

DER

MAY 13 1983

BAQM

Subject:

Regency Square Properties, Inc.

Total Energy Plant Duval County, Florida

Dear Bruce,

The attached material includes revisions to the calculations that I forwarded to you under cover of a letter dated March 25, 1983. These calculations include gas and diesel fuel consumption for the baseline period (1981-82); emission rate calculations for all criteria pollutants for the baseline period; projected increases in fuel consumption, pollutant emission rates and generating capacities for the increases requested by Regency Square Properties.

The baseline pollutant emission rates and fuel consumptions are based upon your calculations; calculations which I have checked and in agreement with. I used the emission factors generated by our firm, based on emission measurements conducted at Regency Square Properties in March 1982, to calculate nitrogen oxides and hydrocarbon emissions. A copy of these emission factors is also attached.

As pointed out by you during one of our recent telephone conversations, the Total Energy Plant at Regency Square Properties is presently a minor emitting facility (the emission rate of no single pollutant exceeds 250 tons per year). Based upon this fact, and our desire for the present permit review not to include a PSD review, have reduced the requested increased hours of operation to 27,600 hours per year (from 27,700 per year) for the six Worthington engines and seven Caterpillar engines that will be used to generate electric power.

May 13, 1983 Page 2

This reduction in requested hours of operation reduced the increased nitrogen oxide emission rate to 249 tons per year. This emission rate increase is less than 250 tons per year; hence a PSD review is not triggered.

In addition to the 27,600 hours per year increase for the engines generating electric power, the two Caterpillar engines that are used to drive the air conditioning compressors will operate 3,500 full load hours or approximately 7,000 total hours (at 50 percent capacity).

If you have any questions regarding this information, please feel free to contact me.

Very truly yours,

SHOLTES & KOOGLER, ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogle, Ph.D., P.E.

JBK: Idh Enclosures

# EMISSION FACTORS FOR NITRIC OXIDES AND HYDROCARBONS BASED ON MARCH 1982 TEST DATE

## REGENCY SQUARE PROPERTIES JACKSONVILLE, FLORIDA

				`	•		otal Emission (gm/min)		Total Emissions (lb/KWH)		
Engine No.	Fuel	Load kw	Stack Temp.	Flow ACFM	NO <sub>2</sub>	NO	HC (Total)	HC(2) (Non-Methane)	NO <sub>x</sub> (3) (as NO <sub>2</sub> )	HC(4) (Non-Methane)	
1	Dua1	1100	340	5668	8.0	61.6	223	6.9	0.0123	0.0008	
2	Dua1	1120	390	6963	13.2	103.0	203	6.3	0.0202	0.0007	
3	Dual	1170	400	6665	23.2	180.0	300	9.3	0.0338	0.0011	
4	Dua 1	1500	896	9635	6.4	48.9	180	5.6	0.0072	0.0005	
6	Dua 1	1670	490	10537	16.4	126.0	518	16.0	0.0166	0.0013	
11(1)	Gas	420	615	1822	0.096	0.62	19.3	0.6	0.0003	0.0002	
4	Diesel	1350	875	8909	8.1	62.7	5.4	5.4	0.0102 <sup>(5)</sup>	0.0005(5)	

<sup>(1)</sup> Engine 11 is one of nine identical Caterpillar engines

Assume the emission rate of 5.4 gm/min (4.0 gm/min/1000 kw) accounts for the non-methane HC from Unit No. 4; i.e. the emissions while fired with diesel fuel. Assume the same non-methane HC emission rate applies to Unit No. 4 when fired with dual fuel. The excess HC emissions from the engine, when fired with dual fuel [(180 gm/min ÷ 1.5 1000 kw) - (4.0 gm/min/1000 kw) = 116.0 gm/min/1000 kw] result from natural gas (methane) leaking by the piston rings.

The ratio of non-methane HC to total HC, therefore, is: 4.0/116.0 = 0.033 Assume this ratio applies to the other Worthington and Caterpillar engines.

- (3)  $NO_X$  as  $NO_2$  (1b/KWH) = [NO<sub>2</sub> + (46/30) NO] gm/min x 60 min/hr x 1/453.6 gm/lb x 1/Load (kw)
- (4) HC (non-methane) (1b/KWH) = HC (gm/min) x 60 min/hr x 1/4536 gm/lb x 1/Load (kw)
- (5) Assume these factors apply to all Worthington engines when fired with 100 percent diesel fuel.

Zeviscal
EMISSION CALCULATIONS

## Engine # 1 - Worthington

Engine - 1900 brake horsepower Generator - 1250 KW

Heat input to generate 1 kW = 12,000 BTW/KW
1250 KW = 15.0×106 BTU

1981-82 Operation

Time - 4737 hours 1045 Gas - 58.38 × 10° ft @ LOZS BTU/ft Diesel - 23.25 × 10° gal @ 145,500 Bru/gal

Total Heaf Input 1981-82

= (58.38×106×1025)+(23.25×103×145,500)

= 6.35×106 BTU/yr (4737 40urs)

= 13.56r

= 13.56r

= 0.89 Capocity during running hours

## Emission Calculations (100% Capacity)

Generating Capacity = 1250 KW x 8760 hr/yr = 10.95 x 106 KW = (13.1 x 1010 BTU/yr heat input)

Fuel Consumption

Dual fuel

Diesel @ 6 gal/hr

= 8760× B

= 52.6 × 10 3 gal/yr

= (0.76×10 10 BTL/yr) - 5.80%

0.59

Gas = 13.1×10 - 0.76×10 10

- 12.54 × 10 10 BTL/yr = 84.80%

= 12.34 × 10 10 BTU/yr - 24.20% × 1/ 1025 BTU/f+3 = 120-3× 106 f+3/yr 119.7

100% Diesel

= 80gal/hr x 8760 hr/yr

= 700.8 × 10 = gal/yr

x 145,500 BTU/gel x 1/12000 BTU/kw

= 8.49 ×10° KW/Yr 8.06

```
Emissions Calculations
```

NOx (0.0123 15 NOx/KWH from test data with dual fuel and 0.0102 16 NOx/KWH from test data with 100% diesel - See Attached)

Emissions

Dual fuel = 10.95 x 106 KW/Yr x 0.0123 lb NOx/KWH

x 1/2000

= 67,3 +py

= 15.38 lb/hr

100% diesel = 8.49 x 10 6 KW/yr x 0.0102 | 6 NO,/kwH 41.1x 1/2000 = 43.3 + py = 9.89 16/hr 9.38

Hydrocarbons (0.0008 lb/KWH with duel fuel and 0.0005 lb/KWH with 100% diesel; from test data - See Attached)

Emissions
Dual fuel = 10.95 x106 kw/yr x 0.0008 x 1/2000
= 4.4 tpy
= 1.00 lb/hr

100% diesel = 8.06 = 2+ tpy = 0.40 lb/hr.

CO (0.004215/KWH gas and 0.009015/KWH diesel - AP-42)

Emissions
Dual fuel = 10.95x10 [a 0500x0.0090)+(2.2420x0.0042)] x

24.2
= 24-8 tpy
= 5-6 16/h
5.5

100% diesel = 8.49 x 10° x 0.0090 x 1/2000 = IB. 2 try = B.716/h 8-3

```
502 (0.70×10-6 15/KWh gas and 0.0028 15/KWh diesel-AREZ)

Emissions

Dual fuel=10.95×10 (0.00580×0.0028) +(0.0040×0.7×10-6)]/200

= 0.9 toy
= 0.2 15/hn

100% diesel = 849×106 (0.0028) (1/2000)
= 11.3 toy
= 2.7 15/hr
2.6

P.M. ( Nil with gas and 0.0030 15/KWh diesel-AP-42)

Emissions
```

Emissions

Dual fuel = 10.95x106 [(2.0580x0.0030) +0]/200

= 0.7

= 0.7 tpy

= 0.2 tpy

100% diesel = 8.49x106 (0.0030)(1/2000)

= 12-7 tpy

= 2.9 |6/hm
2.8

```
nyine #2 - Worthington
             1900 HP Worthington
   Generator - 1250 KW Worthington
   Heat imput to generate
                                       12,000 BT4/KWH
                              1 KW =
                            1250 KW = 15.0x10 BTU/1250 KWH
   1981-82 Operation
             Time - 5720 hrs
                   - 69.35 x 10 6 ft 3 @ 1025 BTM / ft 3
             Diesel - 30.25 x 103 gal
                                        @ 145,500 BT4/gal
            Total Heat Input 1981 - 82 (69.35 × 106 × 1025) + (30.25 × 103 × 14550)
                   = 7.66 × 1010 BTU/YF (5720 hrs)
                       13.40
13.20 × 106 BTU/hr
                       0.88 Copacity during running hours
                          (100% Capacity
   ssion Calculations
   Generating Capacity = 1250 KW x 8760 hr/yr
                           = 10.95 x106 KWH/YE
                           = (13.1 × 1010 BTU/yr heat input)
    Fuel Consumption
             Dual fuel 5.29
                Diesel @ Kgal/hr
                       = 8760 x 65.29
                        = 52-6x103gal/yr
                              x 145,500 BT4/gal
                       = 13-1210 to BTL/Yr total - 0-76x 1000
                       = 12.38x1010 BTU/Yr from gas - 94.22%
                             x 1/1625 BTU/ F+3
                        = 120-7×10 6 ft3/yr
                          119.2
             100% Diesel
                        = 80 gal/hr x 8760 hr/yr
                        = 700.8 × 103 gal/yr

= 700.8 × 103 gal/yr

× 138,500 BTU/gal × 1/12,000 BTU/KWH

-tun capacity)
                       = (8:49 × 106 KWH/yr generating capacity)
   Emissions Calculations
   NOx (0.0202 16/KWH duct firet and 0.0102 16/KWH
```

Emissions

Dual fuel = 0.0202 × 10.95×10 KWH/Yrx 1/2000

= 110.6 tpy
= 25.25 th/r.

```
NOx (cont)
```

8-06 100% Diesel = 850×10° KWH/Yr x'0.0102 | x 1/2000 = 43-3 | tpy = 9.09 | 16/hr 9.38

Hydrocarbons (0.0007 lb/KWH dual fuel and 0.0005 lb/KWH with 100% diesel - Test data)

Emissions

Dual fuel = 0.0007 x 10.95 x 106 12wh/yr x 1/2000

= 3.8 tpy
= 0.88 16/hr
8.06

100% Diesel = 0.0005 x 8.50 x 106 KWH/Yr x 1/2000

100% Diesel = 0.0005 x 8.06 KWH/YF x 1/2000 = 2.0 +py = 0.48 16/6-

CO(0.004216/KWh gas and 0.009016/KWh diesel-AP-42)

Duct fuel = 10.95x10 ((0.0578 x 0.0090)+(0.9422 x 0.0042)]/2000

= 24.3 = 24.5 ter = 5.5

100% Diesel = 8.49x106 (0.0090)/(2000)

36.3 36-2 try

8716/40

302 (0-70x10-616/KWhgas and 0.002816/KWH | diesel - AP-42)

Duel Puel = 10.95x106[(0.0028)(0.9578)+(0.7x10-6)(0.9472)]/200

= 0.8 tpy = 0.2 16/4~

100% Diese = 8.06 (0.0028)/2000 = 11.3 + py | = 2.7 | 16/4 ~

PM(Nil for gas and 0.003016/KWH | diesel-AP-42) Emissions Dual fuel = 10.95×10 (0+(0.0030)(0.0878)]/2000 0.215/Lr = 8.06 = 8.49×106 (0.0030)/2000 = 12.7 + py 2.8 = 2-9 11/hr 100% Diesel

```
Engine # 3 - Worthington
     Engine - 1900 brake horsepower
Generator - 1350 KW
      Heat input to generate 1 KW = 11, 800 BTU/KW
                                        15.93×106 BTU
                             1350 KW =
     1981-82 Operation
              Time - 5453 hours
              Gas - 64.57x106 ft3
              diesel - 33.12 x 103 gal
              Total Heat Input 1981-82
                     = 7-10 x 10 10 BTU/5453 hrs
                     = 13.02 × 106 BTU/ 4~
                        x1/15.93 x 106
                       0.82 Capacity during running hours
                        0.83
Emission Calculations (100% Capacity.
     Generating Capacity = 1350 x 8760
```

= 11.83 x10 6 KW/Yr = ( 13.95 x 10" BTU/yr)

```
Fuel Consumption
        · Dual fuel
                      6.07
             Diesel @ Bgal/hr
                   = 8760×66.07
                   = 52.56 × 10 gal/yr
                   = (0.76 × 10" BTU/yr) - 5.45%
                   = 13.95 \times 10^{10} - 0.26 \times 10^{10} 94.77
             Gas
                   = 13.19x10" BTU/r - 94.55%
                       x 1/+0251045
                      1-28.7 ×106 f+3/4r
         100% Diesel
                   = 80 gal/hr x 8760
                   = 700.8 × 103 gel/yr
                   = (8.49 × 10 6 KW/yr)
```

8.20

```
42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
47-389 200 SHEETS 5 SQUARE
```

```
Emission Calculations
NOx (0.0338 16 NOx/KWH with dual fuel and
        0.0102 15 NOx/KWH with 100% diesel from
        test data )
          Emissions
              Dual fuel = 11.83x10 x 0.0338x1/2000
                         = 199.9 tpy
                         = 45.64 14/hr
              100% diesel = 8.80 × 10 6 × 0.0102 × 1/2000
HC (0.0011 16 HC/KWH with dual friel and
       0.0005 16 HC/KWH with 100% diesel from
       test data)
          Emissions
              Dual fuel = 11.83×106×0.0011×1/2000
                         = 6.5 tpy
                         = 1.4816/40
              100% diesel = 8.50×10° x 0.0005 x1/2000
                         = 2.1 tpy
                         = 0.48 16/hr
CO (AP-42)
          Emissions
              Dual fuel = 11.83×106 (0.0545)(0.0090) + (0.9455)(0.0042)
                                    x1/2000
                           26.3
                         = 26-4 tpy
                         = 6.016/60
              100% diesel = 8.49 x106 (0.0090)/2000
                          = 38.2 tox
                                16/40
502 (AP-42)
                                 0.0523
                                          0-94776.620-6)
          Emissions
              Duel fuel = 11.832106 [0.0545 (0.0028) + 0.5455 (0.74106)]
                                 x 1/2000
                        = 0.9 toy
                        = 0.215/4
              100% diesel = 8.49 x10 (0.0028) /2000 = H.9 try
```

= 2-7 15/4n.

# PM (AP-42)

Emissions

Dual fuel = 11.83×10°[0 + (0.0030)(0.0545)]/2000

= 1.0 toy
= 0.2 13/lm

8.20
100% diesel= 0.49×106 (0.0030)/2000
12.3
= 12.7 toy
= 2.9 13/h2.8

**1** 

```
Engine # 4 - Worthington
    Engine - 2452 brake horsepower
   Generator - 1750 KW
    Heat Input to generate: 1 KW = 11,500 BTU/KW
                                  1750 KW = 20.12 x 106 BTU
    1981-82 Operations ( 4 months)
            Time - 2820 hours
Gas - 49.61 x 10° ft3 gas
             Diesel - 15.72×103 gal diesel
             Total Heat Input 1981-82
                      = 5:31x 10" BTU/2820hrs
                      = 19.84 x 10 6 BT4/4n
                          x 1/20.12×106
                      = 0.94 Capacity during running Lours
Emission Calculations (100% Capacity)
   Generating Capacity = 1750 x 8760
                          = 15.33 × 10 KW/yr
                          = (17.63×101° BT4/yr)
    Fuel Consumption
                 l tuel 5.57
Diesel @ 8 gal/hr
             Dual fuel
                      = 8760 x 85.57
= 52.6 x 103 gal/yr 3.80
= (0.676 x 10" cm/yr) - 4.31%
                Gas = 17.63×1010 - 0.67 1010 96.20
                       16.87 × 10" BTu/yr - 95.69%
                      x 1/+025 1045
                      = 164.6 × 10° ft3/4-
                         162.3
             100 % Diesel
                      = 120 gal/hr x 8760
                      = 1050×103 gal/yr
                       = (+3.3 × 106 KW/4r)
   Emission Calculations
    NOx (0.0072 16 NOx / KWH with dual firel and
          0.0102 16 NOx/KWH with 100% diesel from test data)
```

```
42.381 SO SHETS 5 SQU
42.382 100 SHETS 5 SQU
42.382 200 SHEETS 5 SQU
```

```
Emissions
                Duel Fuel = 15.33 × 10° × 0.0072 × 1/2000
                            = 55.2 tpy
= 12.60 15/40
                100% diesel = 13.3 x10 x 0.010 2 x 1/2000
                            = 67.8 try
                                15-49 16/4n
HC (0.0005 16 HC/KWH for both dual fuel and diesel; test deta)
            EMISSIONS
                Dual fuel
                            = 15.33x106x0.0005x1/2000
                            = 3.8 try
                            = 0.88/6/hn
                100% diesel = 13.3x106 x 0.0005 x 1/200
                              3.3 tpy
                              0.75 16/60
CO (AP-42)
                                       0,038.
                Dual fuel = 15.33 ×10 ((0.0431)(0.0000)+(0.9569)(0.0042)]/200
                            = 33.0 try
= 7.7 16/40
                100% diesel = 13.3x 106 (0.0090) (1/2000)
                            = $ 9.8 try
                            = 13-7 15/4-
SO2(AP-42)
                Duc | Fee = 15.33x106 [(0.0431)(0.0028)+(0.950)(0.7x10-6)]/200
                          = 0.9 tex
                          = 0.215/4-
                100% diesel = 13.3 × 10 (0.0028) (1/2000)
                           = 18.6 tex
                           = 4-2 15/hn
PM(AP42)
                Dual fuel = [5.33 ×10 ( (0.0030) + 0]/2000
= 1.0 ter
           Emissions
                         = 0.216/4-
               100% diesel = 13.3 × 106 (0.0030) (1/2000)
                            = 20.0 tex
                            = 4.6 16/60
```

```
Engine # 5 - Worthington
      Engine - 3875 brake horsepower
      Generator - 2750 KW
      Heat Input to generate: 1 KW = 10,500 BTU/KW
                               2750 KW = 28.88 x10 BTU
      1981-82 Operations
                   Mone
Emission Calculations (100% Capacity
     Generating Capacity = 2750 x 8760
                           = 24.09 x 10 6 KW/yr
                           = (25.29 x 10" BTL/Yr)
      Fuel Consumption
               Dual frel
                            9.28
                   Diesel @ / gol/hr
                        = 8760×719.28
= 61:32 × 103 gal/yr
                         = (0.89 × 1010 BTU/yr) - 3.52%
                        = 25.29×10" - 0-89×10" 95.57
                         = 24.17 = 24.40 × 10' BT4
                             x 1/10251045
                         = 238.0 x 10 ft 1/4r
               100% Diesel
                         = 150 ggl/hr x 8760
                         = 1310 x 103 gal/rr
                         = ( +8.2+ x.106 KW/Yr)
      Emission Calculation
      NOx (0.0166 16 NOx/KWH with dual fuel; test data from
             angine # 6, and 0.0102 16 NOx/KWH with 100%
             diesel; test data from engine # 4)
               Emissions
                   Dual fuel = 24.09 x 10 x 0.0166 x 1/2000
                            = 199.9 tex
                             = 45.65 1L/4n
                   100 % diesel = 1-8.21 x 106 x 0.0102 x 1/2000
```

= 92.9 tpy

= 24.2016/4-

```
HC (0.0013 lb HC/KWH with dual fuel; test data from
        engine #6, and 0.0005 ILHC/KWH with 100% diesel;
        test data from engine * 4)
            Emissions
                Dual Frel = 24.09 x 106 x 0.0013 x 1/2000
                             = 15.7 try
                               3.58 16/40
                100% diesel = 18.21 × 106 × 0.000 5 × 1/2000
= 4.6 tpy
                                1.04 lb/hr
                                 1.00
CO (AP-42)
                                                    0.9557
            Emissions
                Dual fuel = 24.09,106[(0.0352)(0.0090),(0.9648)(0.0042)]/2000
                            = 52.6 tpy
                            = 12.016/40
                100% diesel =182(x10°(0.0090)/(2000)
                            = 81.9+PY
                            = 18-7 13/4-
502 (AP-42)
                Dual fuel = 24.09x10 [(0.0443 \ 0.0028) + (0.7648)(0.7x10 )]/200
                           = 1.2 +px
                           = 0.3 15/hr
                100% diesel=19.21x106(0.0028)/(2000)
                           = 25.5 toy
                           = 5.0 16/h.
PM (AP-42)
                Dual fue = 24.07x106[(0.0352)(0.0030) +0]/2000
                          = +3+ex
                           = 0-315/6-
                100% diesel = 18-21 x 106 (0.0030)/(2000)
= 273+py
                           = 6.216/hr
                              5.9
```

```
Engine # 6 - Worthington
     Engine - 2700, brake horsepower
     Generator - 2137 KW
      Heat Input to generate: IKW = 11, 300 BTU/KW
                                2137 KW = 23.93×106 BTW
      1981-82 Operations (11 months)
              Time - 3721 hours
                     - 71.38×106 f+3
              Diesel - 27.39x103 gal
              Total Host Inputy 1981-82
                        = 7.72 x 1010 BTu /3721 hours
                        = 20.73 x 10 6 BTu/40
                            x 1/23.93 x 10 5
                         Q 87 Capacity during running hours
Emission Calculations (100% Capacity)
     Generating Capacity = 2137 x 8760
                          = 18.72×10° KW/Yr
                          = (20.97 x1010 BT4/41)
      Fuel Consumption
               Dual fuel
                           7.36
                  Diesel @ / gal/hr
                        = 8760×77.36
                        = 64.47
= 64.32 x 10 3 g 1 /yr
                        = (0.89x 1010 BT4/yr) - 4.24%
                        = 20.97 x 10" - 0.89 x 10"
                           20.08 × 10'0 BT4/yr- 95.76%
                              x 1/+0251045
                        = 1-95.9 ×10 ° f+3/yr
               100% Diesel = 140 gal/hr x8760
                        = 1230×103 gal/yr
                         = (15.93 x 10 6 KW/Yr)
```

Mox (0.0166 16 NOx/KWH with dual fuel and 0.0102 16/KWH with 100% diesel - test data)

> Dual fuel = 18.72 × 10° × 0. 0166 × 1/2000 = 155.4 tpy = 35.47 16/h

```
42.382 100 SHEETS 5 SQUARE
42.382 100 SHEETS 5 SQUARE
42.389 200 SHEETS 5 SQUARE
```

```
Nox ( Con+)
                                15.16
                100% Diesel = 15,93 × 106 × 0.0102 × 1/200
                              = 1-8.55 16/hr
 HC (0.0013 IL HC/KWH with dual frel and 0.0005
        16/KWH with 100% diesel; test data)
            Emiss1048
                Dual fuel = 18.72 × 10 ° × 0.0013 × 1/2000
                           = 12.2 +py
                           = 2.78 16/60
                100% Diesel = 15.93 x 10 6 x 0.0005 x 1/2000
= 4.0 tex
                               0.91 16/hn
CO(AP-42)
            Emissions
                Dual fuel = 18.72×10 [(0.0424)(0.0000)+(0.5576)(0.0042)]/2000
                          = 41.2 tex
                           = 9.4 15/hr
                100 % Diesel = 15.16 (0.0090)/(2000)
                           = 71.7 tp/
                            = 16-4/6/4~
 502 (AP-42)
                Duci fuel =18.72x10 ((0.0424)(0.0028) +(0.952/0.7x10-6)]/2000
                         = 1.7 tp/
= 0.3 13/4~
                100% Diesel = 15.93 x 10° (0.0028)/(2000)
                           = 22.3 tpy
                           = S-+ 13/hr
4.8
 DM (AP-42)
            E 11 53 104 5
                Dual fuel=18.72x106[(0.0424)(0.0030)+0]/2000
                         = 1.2 tp/
= 0.3 15/hr
                100% Diesel = 15.16 (0.0030)/(2000)
                           = 5.5 16/4~
                             5.2
```

```
Caterpillar Engines (9 Identical Units)

Engine - 775 brake horsepower

Generators - 500 KW (two engines operate Air

Conditioning compressors
```

Heat Input to generate: 1 KW = 13520 BTY 500 KW = 6.76 × 106 BTY

with comparable output)

1981-82 Operations (9 units total)

Time - 16,234 hours

Gas - 94,44 x 106 ft 5

Diesel - 0; engines operate 100% on gas

Total Heat Input 1981-82

= 94.44 × 106 ft3 × 1025 BTu /ft3

= 9.89 × 10 10 BTu

= 5.96 × 106 BTu/hr

× 1/6.76 × 106

= 0.08 Capacity during running hours

## Emission Calculations (100% Capacity)

Generating Capacity = 500 x 8760 = 4.38 × 10° KW/yr/engine = 39.42 × 10° KW/yr/9 engines

Fuel Consumption

Gas = 500 x 8760 x 13520 x 9 engines

= 53.30 x 10 10 BTu /yr, total

x 1/ tozs BTu/ft>
= 519.9 x 10 c ft3/yr, total 9 engines
510.0

Emission Calculations

NOx (0.0003 lb Nox/KWH with ges; test date)

= 39.42×10° × 0.0007×1/2000 = 5.9 tey; total 9 engines = 1.35 lb/hr

HC (0.000 2 lb HC / KW H with gas; test data)

= 39.42×106 × 0.0002×1/2000

= 3.9 tpy; total 9 engines
= 0.90 lb/hr

)

```
CO (AP-42)

Emissions
= 39.42×10° (0.0042)/(2000)
= 82.8 +P/
= 18.9 16/hr

502 (AP-42)

Emissions

6.67
(2000)
```

SUMMARY OF EMISSION CALCULATIONS

Revised 5/12/83 SHOLTES KKOOGLER

TABLE 1

# SUMMARY OF FUEL CONSUMPTION, GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES EXCEPT THE 9 CATERPILLARS WHEN OPERATING AT 100% CAPACITY ON DIESEL FUEL

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

		Diesel Fuel Firing	100% of the	Time			
Engine	Fuel Diesel (gal/yr)	Generating Capacity (kw/yr)	NOx	Pollutant HC	t Emissio	ons (tpy) SO <sub>2</sub>	РМ
1 2 3 4 6 5	700.8 x 10 <sup>3</sup> 700.8 x 10 <sup>3</sup> 700.8 x 10 <sup>3</sup> 1050.0 x 10 <sup>3</sup> 1230.0 x 10 <sup>3</sup> 1310.0 x 10 <sup>3</sup>	8.06 8.49 x 106 8.06 8.49 x 106 8.20 8.49 x 106 12.613.3 x 106 15.16 15.93 x 106 17.27 18.21 x 106	41.1 <del>43.3</del> 41.1 <del>43.3</del> 41.8 <del>43.3</del> 64.2 <del>67.8</del> 77.3 81.2 88.( <del>92.</del> 9	2.0-2.1 30 ~2.1 3 3.1 3.3 5 3.8 4.0 6	69 <del>38.2</del> 69 <del>38.2</del> 66 <del>59.</del> 8 92 <del>71.</del> 7	11.5 <del>11.</del> 9 17.6 <del>18.6</del> 21.2 <del>22.</del> 3 :	12.1 <del>.12.7</del> 12.3 <del>12.7</del> 19.0 <del>20.0</del> 22.7 <del>23.9</del>
Total	5692.4 x 10 <sup>3</sup>	<del>72.9</del> x 10 <sup>6</sup> 69.4	<del>371.</del> 8 353.6	<del>18.</del> 2 17.4	328.0 317.0	<del>-102.</del> 1 96.7	<del>109.</del> 3 104.(
Emissions	Per 1,000 Hours		<del>7.07</del> 6.73	<del>0.35</del> 0.33	<del>6.24</del> 5.94		

TABLE 2

SUMMARY OF FUEL CONSUMPTION GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES WHEN OPERATING AT 100% CAPACITY ON DUAL FUEL

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

			l Fuel Firing 100 Pe	rcent of th	e Time			-
	Fuel Gas	Use Diesel	Generating Capacity	P	ollutant	: Emissio	ns (tpy)	
Engine	(ft <sup>3</sup> /yr)	(gal/yr)	(kw/yr)	NOx	НС	CO	S0 <sub>2</sub>	PM
1 2 3 4 6 7 Cats 5	119.7 <del>120.7</del> x 106 43 119.7 <del>120.7</del> x 106 46 126.5 <del>128.7</del> x 106 53 162.3 <del>164.6</del> x 106 48 192.7 <del>195.9</del> x 106 64 396.7 <del>404.4</del> x 106 231.3 <del>238.0</del> x 106 81	352.6 x 10 <sup>3</sup> 252.6 x 10 <sup>3</sup> 252.6 x 10 <sup>3</sup> 261.3 x 10 <sup>3</sup> -0-	~10.95 x 106 ~10.95 x 106 ~11.83 x 106 ~15.33 x 106 ~18.72 x 106 ~30.66 x 106 ~24.09 x 106	<pre>67.3 110.6 199.9 55.2 155.4 4.6 199.9</pre>	✓ 3.8 <sup>2</sup> ✓ 6.5 <sup>2</sup> ✓ 3.8 <sup>3</sup> ✓ 12.2 ✓ 3.0	4.2 <del>24.5</del> 4.3 <del>24.5</del> 6.3 <del>26.4</del> 3.6 <del>33.8</del> 41.2 64.4 53.2 <del>52.6</del>	~0.9 0 1.2 <del>1.1</del>	e <del>0.9</del> 9 <del>1.</del> 0 9 <del>1.</del> 0 ~1.2 ~ 0.0
Worthin Caterpi Total	lars <del>,×,404.4</del> x 10 <sup>6</sup> 1 <del>373.</del> 0 x 10 <sup>6</sup>	337.1 333.0 x 10 <sup>3</sup> 0 333.0 x 10 <sup>3</sup> 337.1	91.87 x 10 <sup>6</sup> 30.66 x 10 <sup>6</sup> 122.53 x 10 <sup>6</sup>	788.3 4.6 792.9	746.4 73.0 749.4	202.8 203.0 64.4 267.4 267.2	6.1 5.9 -0.1 6.0 6.2	6.1 6.3 ~0.0 6.3 6.1
Emission Per 1,0 Engine	n Rate Worthingto 00 Caterpilla			√15.00 √0.07	✓ 0.88 ✓ 0.05	✓3.86 ✓1.05		√0.12 √0.0

### SECTION 2.0

CALCULATION OF EMISSION INCREASES FOR PROPOSED ADDITIONAL HOURS OF OPERATION

REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

Revised 5/12/83

### Assume:

- 1. Caterpillars operate 40% of engine hours when engines operate on dual fuel
- 2. Worthingtons operate 60% of engine hours when engines operate on dual fuel
- 3. Engines operate 80% of total engine hours on dual fuel
- 4. Engines operate 20% of Hotal engine hours on diesel fuel
- 5. Two Caterpillar engines used for air conditioning compressors operate a total of 3500 hours per year ( Full load)
- V 6. Emissions from air conditioning Caterpillars at 100% capacity and the same as from generating Catopillars at 100% capacity.

### Emissions Calculation

VI.O Air Conditioning Units 3500 fotal hours 100% gas fuel

```
NOx = (3.5 thousand hours) x 0.07 16/1000 hrs (Tell Z) = 0. Z tpy
HC = (3.5) x 0.05 16/1000 hrs
                                                 = 0.2 tpy -
CO = (3.5) × 1.05 16/1000 hrs
                                                = 3.7 tpy-
Soz = (3.5) x 0.001 16/1000 hrs
                                                 = 40.1 +py ~
                                                 = 0.0 tpy _
PM = (3.5) x 0
```

20 Generating Units 27, 600 hours total

2.1 Dual Fuel @ 80% of time 27,600 × 0.8 = 22,160 hr /r 22,080 h/r

2.1.1 Worthingtons @ 60% of time = 22160 x 0.6

= 13 296 hr/7- 13, 248 hr/1 NOx = (13.296 Housend hrs) x 1500 lb/1000 hrs (Table 2)= 1994 tpx HC = (13.236) × 0.88 CO = (13.236) × 0.11 H-> ter 51.3 try

PM = (13. 292) x 0.12

11-7 51-1

198.7

1.5 tay 1.5 1.6 +.6tpy

```
42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
42-389 200 SHEETS 5 SQUARE
```

```
2.1.2 Caterpillars @ 40% of time = 22160 x 0.4
                 8832 hr/4-
          NOx = (8.832 thousand hrs) x 0.07 lb/1000hrs (Table 2) = 0.6 tpy
                                                             = 0.4 tex
               -(8.864) × 0.05
          CO = (8.864) >1.05
                                                             = 93 tpy
          SO2 - (8.854) x 0.001
PM = (8.864) x 0
                                                             = 40.1 tpy
                                                             = 0.0 tpy
2.2 Diesel fuel 20% of time = 27,700 x 0.2
            = 5540 hn/yr (all Worthingtons)
          NOx = (5.54 thousand hrs) (7.07 16/1000 hrs - Table 1) = 39.2 toy
                                                                          39.0
          HC = (5.54) . 0.35
Co = (5.54) . 6.24
                                                                 4.9 toy
                                                                          1.9
                                                             = 34.6 tpy
                                                                          34.4
          502 = ($.54) × 1.94
Ph · ($.54) × 2.08
                                                             = +0-7++
                                                                         10.7
                                                               41.5tm
                                                                         11.5
23 Dual fuel 100% of time
                                              27600
           Worthingtons - 60% of hours = 27700 x0.6= 16620hr/yr
            Caterpillars - 40% of hours = 27700 x 0.4= 11080 hr/yr
          16.560
      NOx = 16.620 (15.00 - Table 2) + 4.080 (0.07 - Table 2) = 250+ +py 248.4+ 0.8=249
                                                           +5-2+py 14-6+0-6=15.1
      HC = 16.620 (0.88) + 11.080 (0.05)
CO = 16.620 (3.86) + 11.080 (1.05)
                                                           75.8 toy 63.9+11.6=75.5
      Soz = 16.630 (0.11) + 11.080 (0.001)
                                                            1.9ty 1.8+0.01=1.8
      PM = 16.620 (0.12) +
2.4 Generating Capacities
    2.4.1 Dual fuel 80% 13248
               Worthingtons = (13296 hrs) (91.87x10- Table 2)/52560 operating hrs
                                23.24 × 10 6 KW/Yr
               Catarpillars = (8864 hrs) (30.66 x10 - Taller) /7x8760 total possible
                                 4.43 × 106 KW/40
    2.4.2 Diesel 20%
              Worthingtons = (5570 hr) (69.4) Table 1)/6x8760 total proserble
                             7.68 × 10 KW/Yr
    2.4.3 Dual Red 100% 23.16
               Worthingtons = 23.24 (100/80) x106 = 29.05 x106 KW/Yr
               Caterpillars = 4.43 (100/80) x10 = 5.54 x10 Ku/yr
```

### 2.5 Fuel Consumption

2.5.1 Dual fuel 80% of time

Gas: Worthingtons = [13246 hrs]/(52560)] x 368.6x106-Table 2

= 245.0x106 ft //yr

239.8

Catarpillars = [8832 / (7x8760)] x 404.4x106-Table 2

= 58.5 x106 ft //yr

Diasel: Worthingtons = [13248 / (52560)] x 337.1

Diasel: Worthingtons = [13248 / (52560)] x 337.1

= 84.24 × 103 gal/yr

84.97

2.5.2 Diesel fuel 20% of time

Diesel: Worthingtons = [(5540hr)/(cx820)] x 5692.4x103-Talle1 = 600.0x 103 gal/yr 597.8

2.5.3 Duel fuel 100 % of time

Gas: Worthingtons = 239.8 (100/80) = 306.3 x106 (+3/4)

Caterpillars = 57.1

Caterpillars = 50.5 × 106 (100/80) = 73.1×106

84.97

Diesel: Worthingtons = 84.24×103 (100/80) = 105.3×103

gallyr

	Operating		Annual Emissions (tpy)							
Engine	(hr/yr)	NO <sub>X</sub>	HC	0	502	PΜ				
1	2863	22.019.9	1.41.3	9.37.2	0-20.2	<del>-0.3</del> 0.2				
2	. 3457	43.639.0	1.51.4	+1-38.6	<del>-0.2</del> 0.3	0.40-3				
3	3295	75.262.4		11.48.3	0.20.3	0-30-4				
4	1704	+0.710.2	0.7	7.46.2	0-102	0.20.2				
2	0	<del></del>	-0 0	<del>-o-</del> o	- <del>0</del> 0	<del>-0</del> 0				
6	2249	- <del>39.9</del> 35.1	<del>-3.1</del> 2.8	+1-69.4	0.20.3	-0-30.3				
9 Cats	9811	0.7	-0-50.4	13-99.3	-0-140.1	<b>→</b> 0				
Total	23,379/	49 167.3	9.6 8.6	<del>6.1.</del> 949.0	+-01.4	1.51.4				

TABLE 3
PROPOSED INCREASES IN OPERATING RATES

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

	1		Annual Generating	Annual Operating	Anı		lutant Emi ons per ye	ssion Rate ar)	
	Engines(s)	Fue1	Capacity (kw)	Time (hrs)	NOX	HC	CO	SU2	PM
Increase from firing dual fuel 80% of the time and diesel fuel	6 Worthingtons	Dual Diesel	23.16 23.24 x 10 <sup>6</sup> 7.68 x 10 <sup>6</sup> 7.29	13 248 <del>13,2</del> 96 <del>5,540</del> 5570	198-7 <del>199-4</del> 39-2		51-1 <del>513</del> 94 <b>-4</b> 346	1.5	1.6
20% of the time.	7 Caterpillars	Gas	4.42 <del>4.43</del> x 10 <sup>6</sup>	8832 8,864	0.6	0.4	9.3	0.1	0.0
	2 Caterpillars (A/C)	Gas		3,500		0.2	_3.7	0.1	0.0
Total			<del>35.35</del> x 106	3 <del>1,200</del>	<del>239.</del> 4	14.2	<del>28.</del> 9	12.4	13.1
			34.87	31,100	2 38.5		98.5		
Increase from firing	6 Worthingtons	Dua 1	<b>28.95</b> <del>29.05</del> x 10 <sup>6</sup>	16.780	248.4249.3	14.6 6	3.964.2	1.8	2.0
dual fuel 100% of the time	7 Caterpillars	Gas	<b>5.53</b> <del>5.54</del> x 10 <sup>6</sup>	(1 <b>0 € 0</b> <del>11,08</del> 0	0.8	0.6	11.6	0.1	0.0
	2 Caterpillars	Gas		3,500	0.2	0.2	3.7	0.0	0.0
Total		· · · · · · · · · · · · · · · · · · ·	34.59 x 106 34.48	31,200 31,100	250.3 249.4	15.4	79.5 79.2	1.9	2.0
De minimus Emission In	crease				40.0	40 <del>.0</del> 250	100.0 2 50	- <del>40.</del> 0 250	25.0 25C

### TABLE 4

## PROPOSED OPERATING CONDITIONS FOR ALL ENGINES; EXISTING PLUS PROPOSED

## REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

	Annual Generating	Annual Operating	Annual Fuel C	onsumption		Annual (	Emissions (	tpy)	
Condition	Capacity (kw)	Time (hrs)	Diesel (gal)	Gas (ft <sup>3</sup> )	NO <sub>x</sub>	НС	CO	so <sub>2</sub>	PM
Permitted/Actual	26.05 x 10 <sup>6(1)</sup> 22.26	23,379	<del>100</del> x 10 <sup>3</sup> 7 <b>8.</b> 39	· <del>290.</del> 5 x 10 <sup>6</sup> <b>246.</b> 4	167-3 1 <del>92.</del> }	8.6 9.6	49.0 64.9	1.4	1.4
Increase Oual Fuel 100%	2855 20 or 10 <sup>6</sup>	7-16 600	106.2	299.8	248.4	14 CV	63.9	1.04	204
6 Worthingtons 7 Caterpillars 2 Caterpillars	28.95 29.05 x 10 <sup>6</sup> 16 5.53 <del>5.54</del> x 10 <sup>6</sup> 11	040 <del>11,080</del> 3,500	1 <del>05.3</del> x 10 <sup>3</sup> 0 / 7	306.3 x 106 71.4 73.1 x 106 23.1 x 106	2 <del>49.3</del> 0.8 0.2	14.6 0.6 0.2	64.2 11.6 3.7	1.8 ° 0.1 ° 0.0 ′	2.0 V 0.0 V
Total With Oual Fuel 100%	56.74 <del>60.6</del> 4 x 10 <sup>6</sup>	54,479 <del>54,57</del> 9	184,590 <del>205,30</del> 0	<b>640.7</b> <del>693.0</del> x 10 <sup>6</sup>	416.7 <del>442.</del> 4	24.0 <del>25.</del> 0	1 28.2 <del>144.</del> 4	3. 3 - <del>2.9</del>	2.4 3 <del>.5</del>
Increase wal 80% - Diesel 2	20%	· · · · · · · ·							
6 Worthingtons 7 Caterpillars 2 Caterpillars	30.45 <sub>30.92</sub> x 10 <sup>6</sup> 4.42 4.43 x 10 <sup>6</sup>	18768 18,836 9032.8,864 3,500	682.8 684.2 x 10 <sup>3</sup> 0 ~	2 39.8 <del>245.</del> 0 x 10 <sup>6</sup> 57.1 <del>58.5</del> x 10 <sup>6</sup> 23.1 x 10 <sup>6</sup>	2 37.7 <del>238.6</del> 0.6 0.2		85.5 85.9 9.3 3.7	12.2 0.1 0.0	13.1
Total With Oual 80% - Diesel 2	57 <b>.13</b> 20% <del>61.40</del> x 10 <sup>6</sup>	54479 54 <del>,</del> 579	761,190 <del>784,20</del> 0	566.4 <del>617.1</del> x 10 <sup>6</sup>	405.8 <del>431.</del> 5	૮૧. ષ્ટ <del>23.</del> 8	147.5 <del>163.</del> 8	13.7 <del>13.</del> 3	14.5 14.6

<sup>(1)</sup> Based on heating value of present permitted fuel (3.12 x M) BTU/yr) and the average heat requirement to produce one kilowat of power from all engines (11,990 BIH/kw).

from FOER Calculations

## AIR CONDITIONING UNITS SUMMARY OF PROPOSED PERMIT CONDITIONS

## REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

1. Air Conditioning Units

Two gas fired Caterpillar engines rated at 775 brake horsepower each and used to drive air conditioning compressors

2. Maximum Annual Operating Time; Two Engines Total

3,500 full load hours per year; 7,000 actual operating hours at average operating capacity of 50%

3, Fuel

Natural gas at 100% of time; 6,594 ft<sup>3</sup> per hour maximum consumption, each engine

4. Emissions and Emission Increases

	Emissions (tpy)						
Pollutant	Maximum Increase(1)	Maximum Total Emissions <sup>(2)</sup>					
NO <sub>X</sub> HC CO SO <sub>2</sub> PM	0.2 0.2 3.7 0.0 0.0	4(6.7 442.4(2) 24.0 -25.0(2) 147.5 163.8(3) 13.7 13.3(3)					

<sup>(1)</sup> Maximum emissions from two Caterpillar engines used to operate air conditioning compressors

5. Visible Emission Limits (based on Visible Emissions achievable under normal good operating practices)

<sup>(2)</sup> Maximum emissions with generating units and air conditioning units operating at maximum proposed rate

<sup>(3)</sup> With 100% dual fuel firing

<sup>(4)</sup> With 50% dual fuel/50% diesel fuel firing

#### GENERATING UNITS SUMMARY OF PROPOSED PERMIT CONDITIONS

#### REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

#### 1. Generating Units

	Ma	ximum Fuel Consumpt	ion				
	Dual	FueT	100% Diesel	Brake	Generating	BTU Per	
Unit	Gas (ft <sup>3</sup> /hr)	Diesel (gal/hr)	Diesel (gal/hr)	Horsepower	Capacity	Kilowatt	
Worthingtons	,	.,					
#1	13,779/	6 /	80	1,900	1,250	12,00D	
#2	13,77 <b>/</b> 9	6 /	80	1,900	1,250	12,000	
#3	14,692	6 /	80	1,900	1,350	11,800	
#4	18.790	6/	120	2,452	1,750	11,500	
#5	27/169	7/	150	3,875	2,750	10,500	
#6	22,363	Įt.	140	2,700	2,137	11,200	
Caterpillars 7 Identical Units	6,594	/ pl	0	775	500	13,520	

2. Maximum Annual Generating Capacity; All Units

<del>61.0</del> x 10<sup>6</sup> kw/yr 56.7

3. Maximum Number of Engine Hours 51,079 hrs/yr, total with the six Worthington engines permitted to operate up to 5,540 hrs/yr on 100% diesel fuel 2250

4. Fuel Consumption 761,200

784,200 gal/yr, maximum if Worthington engines Diesel fuel:

operate 5,540 hrs/yr on 100% diesel

5520 184,600

Diesel fuel: <del>205,30</del>0 gal/yr, minimum if all engines are dual fuel fired for 51,079 hrs/yr

 $669.9 \times 10^6 \text{ ft}^3/\text{yr}$ , maximum if all engines are dual Gas:

fuel fired for \$1,079 hrs/yr

543.3 50, 979

 $594.0 \times 10^6$  ft<sup>3</sup>/yr, minimum if Worthington engines Gas: operate 5,540 hrs/yr on 100% diesel

#### 5. Emissions and Emission Increases

	Emissions (tpy)						
Pollutant	Maximum Increase	Maximum Total Emissions <sup>(1)</sup>					
NO <sub>X</sub> HC CO SO <sub>2</sub> PM	249.4 250.1(2) 15.4 15.2(2) 98.5 95.2(3) 12.4 12.3(3) 13.1 13.1(3)	416.7 442.4(2) 24.0 25.0(2) 147.5 163.8(3) 13.7 13.3(3) 14.5 14.6(3)					

<sup>(1)</sup> Maximum emissions with generating units and air conditioning units operating at maximum proposed rates.

<sup>(2)</sup> With 100% dual fuel firing.

<sup>(3)</sup> With 80% dual fuel/20% diesel fuel firing.

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

### SUMMARY OF PROPOSED PERMIT CONDITIONS (Continued)

6. Visible Emission Limits (based on Visible Emissions achievable under normal good operating practices - Determined by actual observation)

Unit	Fuel	VE
Worthington #1 Worthington #2 Worthington #3 Worthington #4 Worthington #5 Worthington #6	Dual Dual Dual Dual Dual Dual	10% 5% 5% 15% 10% 5%
Caterpillar	Gas	5%
All Worthingtons	Diesel	20%

```
Engine No.1
1. 4737/38,685 x 23,374 => 2863 hrs / 1981-82 "Basellae"
2. Diesel: 23,250/4737= 4191 gals/hr.
  Gas: 58.38×10 /4737= 12,324.26 5+3/ n=
3. Diesel: 4.91 Sals/hr x 2863 hrs/yr = 14,057.33 gals/1981-82
            x 138,000 Atulgal = 1,939,911,540 Btul 1981-82
        7 12,000 Btu/ KW = /161, 659.3 KW/ 1981-82
    Gas: 12,324.26 St5/hr x 2863 hrs/yr= 35,284,356,38 st3/1981-82
        x 1045 Btu/ft3 = 36,872,152,000 Btu/1981-82
      + 12,000 Bh/KW = 3,072,679.4 KW /1981-82
     total = 3,234,338.7 KW/1981-82
4. 90.4 70 capacity while operating (23,250x138,000)+(58,38x10+x1045)/4737 =
                                              4737/730 = 6,49 mths.
                                        /15,0 x10 = 90,37 70
5. Emissions:
   NOX 1 Diesel x 0:0414 +2000 = 3.35 TPY x 0:0123 + 2000 = 19:89 TPY
    Gas: x 0.033 ÷ 2000 = 50.70 (13.89994)
        54,05 TP4
   CO: Diesel: x 0.0089 + 2000 = 0.72 TPY
  Chasi x 0,0042 + 2000 = 6,45
      7.17 TPY
  HC: Diesely x 0.0033 + 2000 = 0,27 TPY x 0,0008 + 2000 = 1,29 TPY
     Gas; x 0,0130+2000 = 19,97
               20,24 TPY
          NMHC D 10% = 2,02 TPY
   PM1 Olesel: x 0,003 + 2000 = 0,24 TPY
       Gasi NIA
   3021 Diesel: x 0,0028+2000 = 0.23 TPY
     Gas 1 x 6,6x100 + 2000 = 0.01
                           O. 24 TPY
     14,057,33 x 7,02 x 0,0036 x 2 ± 2000= 0,36 TPY
```

```
Engine No. 2
1. 5,720/38,685 x 23,379 => 3457 Krs. / 1981-82 "Baseline"
a Diesel: 30,250/5720 = 5,29 gals/hr
   Gas: 69.35 x 10 / 5720 = 12, 124. 13 5+3/ hr
3. Olesel: 5.29 gals/hrx 3457 hrs/yr = 18,287.53 gals/1981-82
         x 138,000 stulgel = 2,523,679,140 stul 1981-82
         = 12,000 Btu/KW = 210,306.6 KW/1981-42
   Gabi 12,124, 13 5+3/hrx 3457 hrs/x= 41, 913,117.4/5+3/1981-82
          x 1045 Btu/st3 = 43, 799, 208, 000 Btu/1981-82
         +12,000 Btu/KW = 3,649,934,0 KW/1981-82
    total: 3,860,240.6 KD/1981-82
4, 89.3 % capacity while operating /730 = 1187 (30,250 x 138,000) + (69.35 x 106 x 1045)/5720 = 13.40 x 106 = 89.33 %
5. Emissions;
 NDx: Diesel: x 0,04/4+2000= 4.35 TPY x 0,0202+2000= 38,99 TPY
   Gast \times 0.033 + 2000 = 60.22 \qquad (22.56 PH)
   64.57TPY
    CO; Diesel; x 0,0089 + 2000 = 0,94 TPY
   Gas 1 x 0.0042 + 2000 = 7,66
     8,60 TPY
HC: Diesel: x 0,0033 + 2000 = 0,35 TPY x 0.0007 + 2000 = 1,35 TPY
   Gas: x 0,0130+2000 = 23,72
      24.07 TP4
      NMHC D1070= 2,41 T?4
                PM: Diesel: x 0,003 +2000 = 0,32 TPY
    ..... Gas: N/A
    502: Diesel: x 0.0028 + 2000 = 0.29 TPY
   Gas; x 6.6x10-6+2000= 0.01
                          0.30TP4 .
   18,287.53 x 7.02 x 0.0036 x 2 + 2000 = 0.46TPY
```

```
Engine No.3:
```

1, 5453/38,685 x 23,379 => 3295 hrs/1981-82 "Baseline"

2. Diesel: 33,120/5453 = 6.07 gals/ hr

Gas: 64,57x106/5453 = 11,841.19 St3/hr

3. Diesel: 6.07 gals/hrx 3295 hrs/yr = 20,000,65 gals/1981-82

x 138,000 Btulsal = 2,760,089,700 Btul 1981-82

+ 11,800 Btu/KW = [233,905.9] KW/1981-82

Gas: 11,841,19 St3/yr x 3295 has/yr = 39,016,721,05 ft3/1981-82

x 1045 Atul++3 = 40,772, 473,000 Atu/1981-82

+ 11, 800 Btulkw = 3,455,294.4 KW/1981-82

total : 3,689,200.3 KW/1981-82

4. 82.9 % capacity while operating
(33,120 x 138,000)+ (64.57 x 10 b x 1045) / 5453 = 15.21 x 10 b / 15.95 x 10 b = 82.93%

& Emissions:

NOx: Diesel, x 0,0414 + 2000 = 4,84 TPY

x 0.0338 +2000 = . 62.35 TP4

0.063

0.937

Gas: x 0,033 + 2000 = 57.01 (37.85 PPH)

61.85TPY -

CO: Diesel: x 0.0089 + 2000 = 1.04 TPY

Gas: x 0.0042 + 2000 = 7.26

8,30 TP4

HC: Diesel: x 0,0033 +2000 = 0,34 TP4

10,0011 + 2000 = 2.03 TPY

Gas: x 0,0130+2000= 22.46

22.85 TPY

NMHC @ 1070 = 2.29 TPY

PM: Diesel; x 0.003 +2000 = 0.35 TPY

Cas: A/A

502: Dicsel: x 0.0028 +2000= 0.33 TPY

Gas; x 6.6 x10-6+2000 = 0.01

0.34 TP4

20,000.65 x 7.02 x 0,0036 x 2+2000 = 0,51 TPY

```
Engine No. 4:
   2×ão/38,685 x 23,379 ⇒ 1704 hrs/1981-82 Baseline
a. Diesel: 15,720/2820 = 5.57 gals / hr
    Gas: 49.61x10 /2820 = 17,592.20 ft3/hr
3. Diesel: 5,57 gals/hr x 1704 hrs/yr = 9491, 28 gals/ 1981-82
                  x 138,000 Btulgal = 1, 309, 796, 640 Btu/1981-82
                   + 11,500 Btu/KW = /1/3,895.4 KW/1981-82
     Gas: 17,592,20 ft3/hrx 1704 hrs/yr = 29, 977, 108,8 ft3/1981-82
                  x 1045 Btu/st3 = 31,326,079,000 Btu/1981-82
                + 11,500 Btu/ KW = 2,724,006.8
                                                    1 KW/1981-82
                      total: 2,837,902,2
                                                  KW/1981-82
  95.270 capacity during 1981-82 yr. (15,720 x 138,000)+ (49.61×106 x 1045)
   NOx1 Diesel: x 0,04/4+2000= 2,36 TP4 x 0,0072+2000= 10,22 TP4
                                                        (12,00 984)
         Gast x 0.033 + 2000 = 44.95
                      47.31 TPY
   CO: Diesel: x 0.0089 + 2000= 0.51 TP4
        Gast x 0,0042+2000 = 5,72
                             6, 23 TPY
    HC: Diesel: x 0,0033 + 2000 : 0,19 TPY x 0,0005 + 2000 = 0,71 TPY
          Gas: x0,0130+2000 = 17.71
                             בבי וחילם דבי
                NMHCD1070= 1.79 TPY
   PM: Diesel: X 0,003 +2000= 0,17 TPY
          Gas: N/A
   502: Viesel: x 0.0028 + 2000 = 0.16 TPY
        Chas: x 6,6x10-6+2000 = 0,01
                                   0.17 TPY
    9491.28 x 7.02 x 0.0036 x 2+ 2000= 0.24 TPY
```

```
Engine No.5:
1. 2750 KW x 10,500 Btu/KW = 28,875 x 106 Btu/hr maximum
a. 2 88,6670 capacity = 25,600575 x 10 " Btu/hr realistic
3. D 100 To egacity
   28,875x106 Btulhe x 0.05 Diesel (Duel) + 138,000 Btulgal = 10,46 gals/hr
                  x 0.95 cas (onal) + 1045 Btulft3 = 26,250 ft3/hr
... @ 8816670 eapacity ...
                   . 28,875 x 10 6 Btu/hr x 0,8866 x 0,05 + 138,000 = 9,28 gals/hr
                         x 0,95 + 1045 = 23,273.25 5t3/hr ...
4. Diesel:
      9.28 gals /hr x 138,000 Btu/gal = 1,28064 x 106 Btu/hr.
               + 10,500 Btu/ KW = 121.96571 XW/hr => 121.97 XW/hr
  Chas:
      23, 273, 25 St3/hr x 1045 Btu/5t3 = 24,32054 6x106 Btu/hr
      ÷10,500 8+u/KW = 2316.2425 KW/hr => 2316.24 KD/h.
         total: 2438, 2082 xω/hc => 2438, 21 xω/h.
NOx: Diesel: x 0.0414 = 5.05 884 x 0.0166 = 40.47 PPH
      Gas: x 0.033 = 76.44 2PH
         81, 49 PPH
   CO: Diesel: x 0,0089 = 1,09 PPH
    GAS: x 0,0042 = 9.73
         10' 45 bbH
   HC: Diesel: x 0,0033 = 0,40 PPH x 0,0009 = 2,19 PPH
       Gasi X 0.0130 = 30.11
         30.51 PPH ....
           NMHCD10% = 3.05 PPH
    PM: Diesel: X 0,003 = 0.37 PPH Gas: NIA
    5021 Diesel: x 0.0028 = 0.34 PPH
```

Gas: x 6.6 x 10 = 0.02

9,25,001 x 7:02 100/041 x 0,0036 x 2 = 0,47 PPH

```
Engine Na. 6:
```

1. 3721/38,685 x 23,379 => 2249 hrs /1981-82 Baseline

a Diesel: 27,390/3721 = 7.36 gals/hr Gas: 71.38x104/3721 = 19,183.02 ft3/hr

3. Diesel: 7.36 gals /hr x 2249 hrs/yr = 16,552.64 gals/1981-82

x 138,000 Btulgal = 2,284,264, 320 Btul1981-82 + 11,200 Btulkin =/203,952.2 Kin /1981-82

0.048

0,952

(131 ... 2010 1 ... 1 ... 12 ... 11 ... 12 ... 12 ... 12 ... 12 ... 12

Gas: 19,183.02 H3/yr x 2249 hrs/yr = 43,142, 611.98 5+3/1981-82

x 1045 Btu/ft3 = 4,508403 x 1010 Btu/1981-82

+ 11,200 Btm/KW = 4,025,359.8 KW /1981-82 total: 4,229,312.0 KW /1981-82

4. 85,5% capacity while operating 3721/730=5,10 mths
(27,390x13x,000) + (71.38x106x104x)

3721/730=5,10 mths

5, Enissions;

NOX: Diesel:  $\times$  0.04/4+2000 = 4.22TPY  $\times$  0.0166+2000 = 35.10TPY

Gas:  $\times$  0.033+2000 = 6642 (31.21 PPH)

70.64794

CO: Diesel: x 0.0089 + 2000 = 0.91794

Gas: x 0.0042 + 2000 = 8.45

9.367PY

HC: Diesel: x 0.0033+2000= 0.34TPY x 0.0009+2000= 1.90TPY

Gas: x 0.0130+2000= 26.16

26.50TPY

NMHC 01070 = 2.65 TPY

PM: Diesel:  $\times 0.003 + 2000 = 0.3/TPY$ Gas: N/A

502: Diesel: x 0.0028 +2000 = 0.29TPY

Gas: x 6.6x106 +2000 = 0.01

0.30TPY

16,552.64x 7.02 x 0.0036 x 2 +2000 = 0.42TPY

9 Caterpillar Engines: 500 kW : 750 hp.	
16,234/38,685 x 23,379 => 9811 hrs/1981-82 Baselis	ne (total for all Cats)
One Engine: 500 KW/hr x 13,520 Btu/kW + 1045 Btu/543	= 64,68,90 St3/ nr at 1007
Actual operation:	
94,44x 10b 5+3 /1981-82	
+16,234 hrs/1981-82	
5,817.42 St3/hr/engine	
5,817,42 8t3/hr x 9811 hrs/yr = 57,074,707,67	2 St3/1981-82
×1045 8+4/8+3 = 5.9643069x1	010 8tu/1981-82
+ 13,520 Btu/xw = 4,411,469,64	1/KW/1981-82
the state of the s	
Sik	003 ÷ 2000 = 0,66Tf4
(B: x B.DD42 + 2000 = 9.267PY (1.89 PPH)	
51 K	A 0000 40000 - 0.00TO
NMHCD1070= 2187 TP4 ( 0.54 18H)	(0,09 (PH)
	and the second s
PM: N/A	
<u>and and an angle of the state </u>	• 1
502: 1616 x 10-6 +2000 = 0,015 TPY (0,003 PPH)	
	16,234/38,685 × 23,379 ⇒ 9811 hrs/1981-82 Basel.  One Engine: SOOKW/hr × 13,520 btw/xw ÷ 1045 8tw/513  Actual operation:  94,44× 106 5t3 /1981-82  +16,254 hrs/1981-82  5,817.42 5t3/hr/engine  5,817.42 5t3/hr × 9811 hrs/yr = 57,074,707.6.  ×1045 8tw/st3 = 5.9643069×1  ± 13,520 8tw/xw = 4,711,469.64  89,9370 capacity during 1981-82  5817.42 /6468.90 = 89,92970 => 89,9370  Emissions:  NOx: × 0,033 ± 2000 = 72.79 TPY × 0.0  (141848PH)  CO: ∧ 0,0042 ÷ 2000 = 9.26 TPY (1.898PH)  HC: × 0,013 + 2000 = 28,67 TPY (5.858PH) ×  NMHCD1070 = 2.87 TPY (0.598PH)  PM: N/A

## Engine # 18#2:

- 1. Given 1 80 gals/hr
- 2 @ 138,000 Btm/gal x Bogals/hr = 11.04x10° Btm/hr + 12,000 Btm/KW = 920 KW/hr
- 3 Emissions:

NOX : X 0.0414 = 38.088 PPH

x 0.0102 = 9.384 PPH

CO: x 0,0089 = 8,188 PPH

HC: × 0.0033 = 3.036 PPH

× 0.0005 = 0.46 PPH

NMHCD 1070= 0,304 PPH

PM: x 0,0030 = 2,76 PPH

5021 x 0.0028 = 2.576 PPH

C \ +2.			
•		-	
<del>y</del>			
2. 2138,000 Btu/gal x 80gals/100=	11.04x106B+1/h	<b>^</b> :.	
+ 11, 400 Btu/KW = 930	5,59 KW/hr		
D138,000 Btw/gal x 80go/s/10 = 11.04x106 Bt./hr  t 11,400 Btw/kw = 935,59 kw/hr  5missions:  NOx1 x 0.0414 = 38,73 PPH  CO 1 x 0.0089= 8,327 PPH		-	
	X 0,0/02	- 4'5'A 2'L'N'T	
	<u></u>		
CO 1 x 0,0089= 8,327 PPH			
HC ( x 0,0033 = 3,087 PBH	X 0,0005 =	0.468 284	
7777750070707070707070			
1. Chiven: 805/15/hr  2. D138,000 Btw/gal x 8050/1/2 = 11.04x106 Btw/hr  \$1.11,400 Btw/kW = 935,59 kW/hr  3. 5missians:  NOX1 x 0.0414 = 38,73 PPH  CO 1 x 0.0089 = 8,327 PPH  HC 1 x 0.0033 = 3,087 PPH  NMHCD1070 = 0,309 PPH  PM: x 0.0030 = 2,807 PPH			
Colvent 80gals/hr  Dist,000 Btu/gal x 80gals/1v = 11.04x106 Bt./hr  til,400 Btu/kw = 935,59 kw/hr  Six  NOx1 x 0.0414 = 38,73 88H x 0.0702 = 9,543 88H  CO x 0.0089= 8,327 88H  HC x 0.0033= 3,047 88H  NMHCD1070= 0,309 88H  PM: x 0.0030 = 2,807 88H			
5021 x 0,0028 = 2,620 PPH			
: :			
,			
· · · · · · · · · · · · · · · · · · ·	·		
	***************************************		
			-
	Α		
:		•	

Engine #4 1

1. alven: 120 gals/hr

2. D 138,000 Btu/sal x 120 gals/hr = 16,56 x100 Btu/hr

= 11,500 Bta/RW = 1440 XW/hr

3. Emissions:

NOX: x 0,0414 = 59,616

× 0.0102 = 14.688 PPH

CO: x 0,0089 = 12.816 PPH

HC: x 0,0033 = 4,752 PPH

NMHCD 1070 = 0.475 PBH

x 0,0005 = 0,72 PPH

PM1 x 0.0030 = 4,32 384

502: x 0,0028 = 4,032 PPH

Engline # 5: Onliven: 150 gals line
@ 13 4,000 Btu/sal x 150 ga/s/hr = 20,70 x100 Btu/hc
+ 10,500 B+4 / KW = 1971, 429 KW/hr
Emissions
NOx: X 0,0414 = 81,617 PPH X 0,0102 = 20,109 PPH
CO: x 0,0089 = 17,546 PPH
HC: x010033 = 6,506 PPH x 0,0005 = 0,986
MMHCD1070 = 0.651 PBH
PM: x0,0030 = 5,914 PPH
•
502: x 0,0028 = 5,52 PPH

Engine #6:

1 Calvent 140 gals/hr

a. @ 138,000 otalgal & 140 gals/hr = 19.32x109 stulha

+ 11,200 BtulkW = 1725 KW/hr

3 Emissions:

NOx × 0.0414 = 71.415 PBH 又 0.0/02 = 17.595 PBH

CO: x 0,0089 = 15,35388H

HC; x 0,0033 = 5,69388H x 0,0005 = 0,86388H

NMHCD10% = 0.5698PH

PM: x 0,0030 = 5,17588H

5021 x 0,0028 = 4,838PH

## State of Florida DEPARTMENT OF ENVIRONMENTAL REGULATION

#### INTEROFFICE MEMORANDUM

For Ro And/Or T	outing To District Offices o Other Than The Addresse	99
To:	Loctn.:	
То:	Loctn.:	
To:	Loctn.:	
From:	Date:	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:	1

TO: Regency Square Properties, Inc. File - AC 16-60981

FROM: Bruce Mitchell

DATE: May 9, 1983

SUBJ: Baseline Emissions Inventory Calculations

The attached material will be used as the baseline emissions for the Regency Square Properties, Inc. for the operating years 1980-82. The data was developed using the emission factors from AP-42 Emission Factors (CO,SO2,PM), emission factors established from stack tests performed by Sholtes & Koogler, Environmental Consultants, Inc., in March, 1982 (NO $_{\rm X}$ ,VOC:non-methane hydrocarbons), and the permitted hours of operation (23,379).

RBM/rbm

cc: John B. Koogler

## DEPARTMENT OF ENVIRONMENTAL REGULATION

	ACT	ION NO.	
ROUTING AND TRANSMITTAL SLIP	ACT	ON DUE DA	18
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SKEC 258-81-01

March 25, 1983

Mr. Clair Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

DER 28 1983 BAQM

Subject: Regency Square Properties, Inc.

Total Energy Plant Duval County, Florida

Dear Mr. Fancy:

For the record I am transmitting herewith a copy of emission rate calculations, electric power generating capacities, and fuel consumption of all units in the Regency Square Properties Total Energy Plant that I hand delivered to Mr. Bruce Mitchell of your staff during a meeting with him on March 1, 1983. Also, enclosed is a revised Air Quality Review for the Total Energy Plant reflecting the increased and the total nitrogen oxides emissions from this facility and a response to your letter of March 16, 1983 to Mr. Robert Gillander of Regency Square Properties requesting information on the existing air conditioning system associated with the total energy plant.

The electric powered generating units associated with the Regency Square Properties Total Energy Plant include five existing Worthington engine/electric power generator units, one proposed Worthington engine/electric power generator, seven Caterpillar engine/electric power generator units and two Caterpillar engine/air conditioning chiller units.

The attached information as explained in detail to Mr. Mitchell, includes the emission factors used for calculating emission rates of nitrogen oxides, particulate matter, sulfur dioxide, hydrocarbons and carbon monoxide from the units; the calculation of annual emissions of each of these pollutants from all units; and a summary of presently permitted and proposed operating conditions. The emission factors included herein are based either

on test data developed by Sholtes & Koogler, Environmental Consultants from tests conducted at Regency Square Properties or are factors published in the EPA Emission Factor Document AP-42.

The emission rate calculations have been made for both dual fuel (natural gas and diesel) firing of the Worthington engines and for 100 percent diesel fuel firing of these engines. All emission rate calculations for the Caterpillar engine are based on firing with natural gas; the only fuel these engines will operate on. The emission rate calculations were made under three sets of conditions; with each engine operating at 100 percent capacity, with the engines operating at presently permitted rates and with the engines operating at the proposed rates.

Table 3 of Attachment 1 summarizes the proposed increases in engine operating rates and the resulting increases in air pollutant emission rates. In reviewing this table, it will be noted that the only pollutant emission rate which exceeds the de minimus emission rate increase defined by State PSD regulations is the increase in nitrogen oxides emissions. As a result of this, only the increase in nitrogen oxides emissions and the total nitrogen oxides emission rate need be addressed in reviewing the permit application for Regency Square Properties.

Table 4 of the attached information summarizes the presently permitted operating conditions for the Total Energy Plant and summarizes the proposed increases in annual electric power generating capacity, the increases in hour of operation, increases in fuel consumption and the increases in air pollutant All increases were calculated both under the emission rates. assumption that the engines in the Total Energy Plant will be fired with dual fuel (natural gas only for the Caterpillar engines) 100 percent of the time and under the assumption that the engines will be fired with dual fuel 80 percent of the time and diesel fuel 20 percent of the time (again, natural gas only for the Caterpillar The calculation of engine operating parameters and emission rates were made under the assumption that Worthington engines will be fired with diesel fuel 20 percent of the time to account for the possibility of gas curtailment at the Total Energy Plant.

The final item in Attachment 1 is a summary of proposed permit conditions for the six Worthington engines and seven Caterpillar engines that will be used to generate electric power and a similar summary for the two Caterpillar engines that are used to drive the air conditioning chillers.

Mr. Clair Fancy Florida Department of Environmental Regulation

Attachment 2 is a revision of the Air Quality Review showing the impact of increased nitrogen oxide emissions from the Total Energy Plant and showing the impact of total nitrogen oxide emissions from the plant. The impact of total nitrogen oxides emissions includes a background nitrogen oxides concentration of 33 micrograms per cubic meter, annual average, as described in the original permit application.

The maximum annual increase in ambient nitrogen oxides levels resulting from the proposed increased hours of operation is 13 micrograms per cubic meter. This impact occurs in approximately 300 meters northeast of the Total Energy Plant. The maximum impact of emissions from all units in the Total Energy Plant, when operating at the maximum proposed rate and including a background concentration of 33 micrograms per cubic meter, is 55 micrograms per cubic meter, annual average. This impact also occurs approximately 300 meters northeast of the Total Energy Plant and compares with an annual average air quality standard for nitrogen oxides of 100 micrograms per cubic meter. The nitrogen oxides impacts for increased emissions and total emissions are summarized in Figures 1 and of Attachment 2. The air quality modeling results from which these figures were prepared are also included in Attachment 2.

Attachment 3, in part, is a response to your letter of March 1983, requesting additional information about the 16, conditioning system which is part of the Total Energy Plant. remainder of the response to your March 16 letter is included in the following paragraphs. The annual hours of operation of the two Caterpillar engines used to drive the air conditioning chillers as summarized in Tables 3 and 4 of Attachment 1, are 3,500 full load hours, total for both engines. The actual operating time for both engines combined will be about 7,000 hours. The two Caterpillar engine driven chillers comprise 1,350 tons, or 38.6 percent of the total air conditioning capacity of the Total Energy Plant. The remaining capacity of the air conditioning system, or 2,150 tons, is An absorption chiller, which supplied by two other systems. operates on heat recovered from the engines used to drive the electric power generators provides 650 tons of capacity or 18.6 percent of the total capacity, and two electrically driven chillers provide the remaining 1,500 tons, or 42.8 percent, of the total capacity. The two Caterpillar engine driven chillers are the only units in the air conditioning system that constitute a source of air pollutant emissions, and hence, are the only units addressed in this application.

The heating system used by the Regency Square Shopping Center utilizes waste heat recovered from the engine used to drive the electric power generators. It is not feasible for Regency Square Properties to operate these engines strictly to generate heat for the heating system, hence, this mode of operation is not a factor that needs to be considered in preparing permit conditions.

Attachment 3 is the requested floor plan of the existing facility including a summary of the area which must be heated and cooled. Presently, the heated and cooled area consists of 1,245,143 square feet of shopping space, 115,000 square feet of common floor area and 100,000 square feet of office space. The total area heated and cooled by the Total Energy Plant is 1,460,143 square feet of floor space. The additional 84,000 square feet of office space and the 11,000 square feet of theater are heated and cooled by separate heating and cooling system. The plot plan (Exhibit 3) also shows a potential future development of 203,374 square feet of floor space in the shopping center.

To the best of my knowledge, the information contained herein provides all of the information your staff has requested to complete the review of the permit application for Regency Square Properties. If there are any questions regarding this information or if additional information should be needed, please feel free to contact me.

Very truly yours,

SHOLTES & KOOGLER

ENVIRONMENTAL CONSULTANTS, INC.

Jókn B. Koggler, Ph.D., P.E.

JBK: Idh Enclosures

cc: Mr. Robert Gillander

ATTACHMENT 1
EMISSION RATE CALCULATIONS

## SECTION 1.0

EMISSION RATE CALCULATIONS FOR EACH GENERATING UNIT

REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

EMISSION FACTORS

# SHOLIES KNOOGLEI

#### EMISSION FACTORS FOR NITRIC OXIDES AND HYDROCARBONS BASED ON MARCH 1982 TEST DATE

# REGENCY SQUARE PROPERTIES JACKSONVILLE, FLORIDA

						т.	otal Emissions (gm/min)	5		Emissions b/KWH)
Engine No.	Fuel	Load kw	Stack Temp. °F	Flow ACFM	NO <sub>2</sub>	NO	HC (Total)	HC(2) (Non-Methane)	NO <sub>x</sub> (3) ne) (as NO <sub>2</sub> ) (N	HC(4) (Non-Methane)
1	Dua 1	1100	340	5668	8.0	61.6	223	6.9	0.0123	0.0008
2	Dual	1120	390	6963	13.2	103.0	203	6.3	0.0202	0.0007
3	Dua 1	1170	400	6665	23.2	180.0	300	9.3	0.0338	0.0011
4	Dua 1	1500	896	9635	6.4	48.9	180	5.6	0.0072	0.0005
6	Dua 1	1670	490	10537	16.4	126.0	518	16.0	0.0166	0.0013
11(1)	Gas	420	615	1822	0.096	0.62	19.3	0.6	0.0003	0.0002
4	Diesel	1350	875	8909	8.1	62.7	5.4	5.4	0.0102 <sup>(5)</sup>	0.0005(5)

- (1) Engine 11 is one of nine identical Caterpillar engines
- Assume the emission rate of 5.4 gm/min (4.0 gm/min/1000 kw) accounts for the non-methane HC from Unit No. 4; i.e. the emissions while fired with diesel fuel. Assume the same non-methane HC emission rate applies to Unit No. 4 when fired with dual fuel. The excess HC emissions from the engine, when fired with dual fuel [(180 gm/min 1.5 1000 kw) (4.0 gm/min/1000 kw) = 116.0 gm/min/1000 kw] result from natural gas (methane) leaking by the piston rings.

The ratio of non-methane HC to total HC, therefore, is: 4.0/116.0 = 0.033 Assume this ratio applies to the other Worthington and Caterpillar engines.

- (3)  $NO_X$  as  $NO_2$  (1b/KWH) = [ $NO_2$  + (46/30)  $NO_3$  gm/min x 60 min/hr x 1/453.6 gm/1b x 1/Load (kw)
- (4) HC (non-methane) (1b/KWH) = HC (gm/min) x 60 min/hr x 1/4536 gm/1b x 1/Load (kw)
- (5) Assume these factors apply to all Worthington engines when fired with 100 percent diesel fuel.

- 3.3.2.1 General 1 Engines in the natural gas industry are used primarily to power compressors used for pipeline transportation, field gathering (collecting gas from wells), underground storage, and gas processing plant applications. Pipeline engines are concentrated in the major gas producing states (such as those along the Gulf Coast) and along the major gas pipelines. Both reciprocating engines and gas turbines are utilized, but the trend has been toward use of large gas turbines. Gas turbines emit considerably fewer pollutants than do reciprocating engines; however, reciprocating engines are generally more efficient in their use of fuel.
- 3.3.2.2 Emissions and Controls<sup>1,2</sup> The primary pollutant of concern Is NO<sub>X</sub>, which readily forms in the high temperature, pressure, and excess air environment found in natural-gas-fired compressor engines. Lesser amounts of carbon monoxide and hydrocarbons are emitted, although for each unit of natural gas burned, compressor engines (particularly reciprocating engines) emlt significantly more of these pollutants than do external combustion boilers. Sulfur oxides emissions are proportional to the sulfur content of the fuel and will usually be quite low because of the negligible sulfur content of most pipeline gas.

The major variables affecting  $NO_X$  emissions from compressor engines include the air fuel ratio, engine load (defined as the ratio of the operating horsepower divided by the rated horsepower), intake (manifold) air temperature, and absolute humidity. In general,  $NO_X$  emissions increase with increasing load and intake air temperature and decrease with increasing absolute humidity and air fuel ratio. (The latter already being, in most compressor engines, on the "lean" side of that air fuel ratio at which maximum  $NO_X$  formation occurs.) Quantitative estimates of the effects of these variables are presented in Reference 2.

Because  $NO_X$  is the primary pollutant of significance emitted from pipeline compressor engines, control measures to date have been directed mainly at limiting  $NO_X$  emissions. For gas turbines, the most effective method of controlling  $NO_X$  emissions is the injection of water into the combustion chamber. Nitrogen oxides reductions as high as 80 percent can be achieved by this method. Moreover, water injection results in only nominal reductions in overall turbine efficiency. Steam injection can also be employed, but the resulting  $NO_X$  reductions may not be as great as with water injection, and it has the added disadvantage that a supply of steam must be readily available. Exhaust gas recirculation, wherein a portion of the exhaust gases is recirculated back into the intake manifold, may result in  $NO_X$  reductions of up to 50 percent. This technique, however, may not be practical in many cases because the recirculated gases must be cooled to prevent engine malfunction. Other combustion modifications, designed to reduce the temperature and/or residence time of the combustion gases, can also be effective in reducing  $NO_X$  emissions by 10 to 40 percent in specific gas turbine units.

For reciprocating gas-fired engines, the most effective NO<sub>X</sub> control measures are those that change the air-fuel ratio. Thus, changes in engine torque, speed, intake air temperature, etc., that in turn increase the air-fuel ratio, may all result in lower NO<sub>X</sub> emissions. Exhaust gas recirculation may also be effective in lowering NO<sub>X</sub> emissions although, as with turbines, there are practical limits because of the large quantities of exhaust gas that must be cooled. Available data suggest that other NO<sub>X</sub> control measures, including water and steam injection, have only limited application to reciprocating gas-fired engines.

Emission factors for natural-gas-fired pipeline compressor engines are presented in Table 3.3.2-1.

#### Table 3.3.2-1. EMISSION FACTORS FOR HEAVY-DUTY, NATURAL-GAS-FIRED PIPELINE COMPRESSOR ENGINES<sup>®</sup>

#### EMISSION FACTOR RATING: A

:	Nitrogen oxides (as NO <sub>2</sub> ) <sup>b</sup>	Carbon monoxide	Hydrocarbons (as C) <sup>C</sup>	Sulfur dioxide <sup>d</sup>	Particulate <sup>e</sup>
Reciprocating engines					
1b/10 <sup>3</sup> hp-hr	24	3.1	9.7	0.004	NA.
g/hp-hr	11	1.4	4.4	0.002	, NA
g/kW-hr	15	0.004z 1.9	5.9	0.003 O.7K	D Tokun NA
1b/106 scff	3,400	430	1,400	0.6	NA
kg/10 <sup>6</sup> <u>N</u> m <sup>3f</sup>	55,400	7,020	21,800	9.2	NA
Gas turbines					
lb/10 <sup>3</sup> hp-hr	2.9	1.1	0.2	0.004	NA
g/hp-hr	1.3	0.5	0.1	0.002	NA
g/kW-hr	1.7	0.7	0.1	0.003	NA NA
1b/10 <sup>6</sup> scf <sup>9</sup>	300	120	23	0.6	NA NA
kg/106 Nm <sup>3</sup> g	4,700	1,940	280	9.2	NA

<sup>&</sup>lt;sup>8</sup>All factors based on References 2 and 3.

#### References for Section 3.3.2

- Standard Support Document and Environmental Impact Statement Stationary Reciprocating Internal Combustion Engines. Aerotherm/Acurex Corp., Mountain View, Calif. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-1318, Task Order No. 7, November 1974.
- 2. Urban, C.M. and K.J. Springer. Study of Exhaust Emissions from Natural Gas Pipeline Compressor Engines. Southwest Research Institute, San Antonio, Texas. Prepared for American Gas Association, Arlington, Va. February 1975.
- 3. Dietzmann, H.E. and K.J. Springer. Exhaust Emissions from Piston and Gas Turbine Engines Used in Natural Gas Transmission. Southwest Research Institute, San Antonio, Texas. Prepared for American Gas Association, Arlington, Va. January 1974.

bThese factors are for compressor engines operated at rated load, In general, NO<sub>x</sub> emissions will increase with increasing load and intake (manifold) air temperature and decrease with increasing eir-fuel ratios (excess air rates) and absolute humidity. Quantitative estimates of the affects of these veriables are presented in Reference 2.

<sup>&</sup>lt;sup>C</sup>These factors represent total hydrocarbons. Nonmethane hydrocarbons are estimated to make up to 5 to 10 percent of these totals, on the average.

<sup>&</sup>lt;sup>d</sup>Based on an assumed sulfur content of pipeline gas of 2000 gr/10<sup>8</sup> scf (4600 g/Nm<sup>3</sup>). If pipeline quality natural gas is not fired, a material belance should be performed to determine SO<sub>2</sub> emissions based on the actual sulfur content.

<sup>\*</sup>Not available from existing data.

<sup>&</sup>lt;sup>1</sup>These factors are calculated from the above factors for reciprocating engines assuming a heating value of 1050 Btu/scf (9350 kcal/Nm<sup>3</sup>) for natural gas and an average fuel consumption of 7500 Btu/hp-hr (2530 kcal/kW-hr).

<sup>&</sup>lt;sup>9</sup>These fectors are calculated from the above factors for gas turbines assuming a heating value of 1,060 8 tu/scf (9,350 kcal/ Nm<sup>3</sup>) of natural gas and an average fuel consumption of 10,000 8 tu/hp-hr (3,380 kcal/kW-hr).

3.3.3-1 General This engine category covers a wide variety of industrial applications of both easoline and diesel internal combination power plants, such as fork lift trucks, mobile refrigeration units, generators, pumps, and portable well-drilling equipment. The rated power of these engines covers a rather substantial range—from less than 15 kW to 186 kW (20 to 250 hp) for gasoline engines and from 34 kW to 447 kW (45 to 600 hp) for diesel engines. Understandably, substantial differences in both annual usage (hours per year) and engine duty cycles also exist. It was necessary, therefore, to make reasonable assumptions concerning usage in order to formulate emission factors. I

3.3.3-2 Emissions – Once reasonable usage and duty cycles for this category were ascertained, emission values from each of the test engines <sup>1</sup> were aggregated (on the basis of nationwide engine population statistics) to arrive at the factors presented in Table 3.3.3-1. Because of their aggregate nature, data contained in this table must be applied to a population of industrial engines rather than to an individual power plant.

The best method for calculating emissions is on the basis of "brake specific" emission factors (g/kWh or lb/hphr). Emissions are calculated by taking the product of the brake specific emission factor, the usage in hours (that is, hours per year or hours per day), the power available (rated power), and the load factor (the power actually used divided by the power available).

Table 3.3.3-1. EMISSION FACTORS FOR GASOLINE-AND DIESEL-POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

·	Engine c	ategory <sup>b</sup>	
Pollutant <sup>a</sup>	Gasoline	Diesel	
Carbon monoxide			
g/hr	5700.	197.	
lb/hr	12.6	0.434	
g/kWh	267.	4.06 ~	0.0090 11/KWL
g/hphr	199.	3.03	
kg/10³ liter	472.	12.2	•
lb/10 <sup>3</sup> gal	3940.	102.	
Exhaust hydrocarbons			
g/hr	191.	72.8	
lb/hr	0.421	0.160	
g/kWh	8.95	1.50	
g/hphr	6.68	1.12	
kg/10 <sup>3</sup> liter	15.8	4.49	
lb/10 <sup>3</sup> gal	132. ·	37.5	
Evaporative hydrocarbons			
g/hr	62.0	_	
lb/hr	0.137	-	
Crankcase hydrocarbons		<u>-</u>	
g/hr	38.3	-	
lb/hr	0.084		

Table 3.3.3-1. (continued). EMISSION FACTORS FOR GASOLINE-AND DIESEL-POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

	Engine ca		
Pollutant <sup>a</sup>	Gasoline	Diesel	
Nitrogen oxides		· ·	
g/hr	148.	910.	
lb/hr	0.326	2.01	
g/kWh	6.92	18.8	
g/hphr	5.16	14.0 ,	
kg/10 <sup>3</sup> liter	12.2	56.2	
lb/10³ gal	102.	469.	
Aldehydes			
g/hr	6.33	13.7	
lb/hr	0.014	0.030	
g/kWh	0.30	0.28	
g/hphr	0.22	0.21	
kg/10³ liter	0.522 🐔	0.84	
lb/10³ gal	4.36	7.04	
ulfur oxides		·	
g/hr	7.67	60.5	
lb/hr	0.017	0.133	,,
g/kWh	0.359	1.75-0.00Zell/km	וק
g/hphr	0.268	0.931	
kg/10 <sup>3</sup> liter	0.636	3.74	
lb/10 <sup>3</sup> gal	5.31	31.2	
articulate			
g/hr	9.33	65.0	
lb/hr	0.021	0.143	
g/kWh	0.439	1.34-0.0030/b/km	ידן
g/hphr	0.327	1.00	
kg/10 <sup>3</sup> liter	0.775	4.01	
lb/10 <sup>3</sup> gal	6.47	33.5	

<sup>&</sup>lt;sup>a</sup>References 1 and 2.

#### References for Section 3.3.3

- 1. Hare, C. T. and K. J. Springer. Exhaust Emissions from Uncontrolled Vehicles and Related Equipment Using Internal Combustion Engines. Final Report. Part 5: Heavy-Duty Farm, Construction, and Industrial Engines. Southwest Research Institute. San Antonio, Texas. Prepared for Environmental Protection Agency, Research Triangle Park, N.C., under Contract No. EHS 70-108. October 1973. 105 p.
- 2. Hare, C. T. Letter to C. C. Masser of the Environmental Protection Agency concerning fuel-based emission rates for farm, construction, and industrial engines. San Antonio, Tex. January 14, 1974.

bAs discussed in the text, the engines used to determine the results in this table cover a wide range of uses and power. The listed values do not, however, necessarily apply to some very large stationary diesel engines.

EMISSION CALCULATIONS

## Engine \* 1 - Worthington

Engine - 1900 brake horsepower Generator - 1250 KW

Heat input to generate 1 kw = 12,000 BTW/KW 1250 kw = 15.0x106 BT4

1981-82 Operation

Time - 4737 yours

Gas - 58.38 x 10 6 Pt 3 1025 BT4/Pt3

Diesel - 23.25 x 103 gal @ 145,500 Bru/gal

Total Heaf Input 1981-82

=  $(58.38 \times 10^6 \times 1025) + (23.25 \times 10^3 \times 145,500)$ 

- 6.32 × 10 10 BTU/4r (4737 4ours)

= 13.75 × 10 6 BT4 / 4040

= 0.89 Capacity during running hours

# Enission Calculations (100% Capacity)

Generating Capacity = 1250 KW x 8760 hr/4r = 10.95×106 KW

= (13.1 x 10 10 BTU/y- heat input)

Fuel Consumption

Dual fuel

Diesel @ 6 gal/hr

= 8760x 6

= 52.6 × 10 3 gal/yr = (0.76 × 10 10 BTU/yr) - 5.80%

Gas = 13.1×1010 - 0.76×1010

= 12.34 × 10 " BTU/yr - 94.20% x 1/1025 BTU/f+3

= 120.7 × 106 ft3/yr

100% Diesel

= 80gal/hr x 8760 hr/yr

= 700.8 x10 = gal/yr

x 145,500 BTU/gel x 1/12000 BTU/kw

= 8.49 ×106 KW/Yr

```
Emissions Calculations
NOx (0.0123 16 NOx/KWH from test data with
         dual fuel and 0.0102 16 NOx/KWH from test
         data with 100% diesel - See Attached)
          Emissions
             Dual fuel = 10.95 x 10 6 KW/yr x 0.0123 lb NOx/KWH
                             x 1/2000
                       = 67.3 +py
                       = 15.38 16/4-
             100% diesel = 8.49 x 10 6 KW/yr x 0.0102 16 NO, / KWH
                             x 1/2000
                        = 43.3 tpy
                           9.89 16/hr
Hydrocarbons (0.0008 16/KWH with duel fuel
               0.0005 15/KWH with 100% diesel; from
               test data - See Attached)
         Emissions
             Dual fuel = 10.95 x106 KW/yr x 0.0008 x 1/2000
                       = 4.4 tpx
                       = 1.00 lb/hr
             100 % diesel = 8.49 x 10 6 KW/yr x 0.0005 x 1/200
                        = 2.1 tpy
= 0.40 lb/hr.
CO (0.004216/KWH gas and 0.009016/KWH diesel - AP-42)
         Emissions
```

Emissions
Dual fuel = 10.95x10 [[a 0580x0.0090]+(0.9420x0.0042)] x

1/2000
= 24.5 tpy
= 5.6 16/h

100% diesel = 8.49 x 10 x 0.0090 x 1/2000 = 38.2 try = 8.7 16/m

```
502 (0.70×10-6 15/KWh gas and 0.0028 15/KWh diesel-AR42)

Emissions

Dual fuel=10.95×10-6(0.0580×0.0028)+(0.9420×0.7×10-6)]/200

= 0.9 toy

= 0.2 15/hn

100% diesel = 8.49×10-6(0.0028)(1/2000)

= 11.9 toy

= 2.7 15/hr

P.M. (Nil with gas and 0.0030 15/KWh diesel-AP-42)
```

Emissions
Dual fuel = 10.95x106 [(0.0580x0.0030) +0]/2000
= 0.9 tpy
= 0.2 tpy
100% diesel = 8.49x106 (0.0030)(1/2000)
= 12.7 tpy
= 2.9 15/40

```
42.382 100 SHEETS 5 SQUARE 42.382 200 SHEETS 5 SQUARE
```

```
42.381 50 SH
42.382 100 SH
42.389 200 SH
```

```
Engine - 1900 HP Worthington
     Generator - 1250 KW Worthington
     Heat in put to generate 1 KW = 12,000 BT4/KWH
                            1250 KW = 15.0x10 BTU/1250 KWH
     1981-82 Operation
              Time - 5720 hrs
              Gas - 69.35 x 106 ft3 @ 1025 BTM/ft3
              Diesel - 30.25 × 103 gal @ 145,500 BT4/gal
              Total Heat Input 1981-82
                     = (69.35 \times 10^6 \times 1025) + (30.25 \times 10^3 \times 14550)
                     = 7.55 x 1010 BTU/YF (5720 hrs)
                      13.20×10 BTU/hr
                        0.88 Capacity during running hours
Emission Calculations (100% Capacity
     Generating Capacity = 1250 KW x 8760 hr/yr
                           = 10.95 x 106 KWH/YF
                           = (13.1 × 101° BTU/yr heat input)
     Fuel Consumption
              Dual fuel
                  Diesel @ 6 gal/hr
                        = 8760 x 6
                        = 52.6x103gal/yr
                             x 145, 500 BT4/gal
                        = 0.76x10'0 BT4/yr - 5.78%
                  Gas = 13.1×10 to BTL/yr tohl - 0.76×100
                        = 12.38 × 1010 BTU/Yr from gas - 94.22%
                         x 1/1025 BT4/18t3
                        = 120.7×10 6 ft3/yr
              100% Diesel
                        = 80 gal/hr x 8760 hr/yr
                        = 700.8 x 103 gel /yr
                        = (8.49 × 10 KWH/yr generating capacity)
     Emissions Calculations
     NOx (0.0202 lb/KWH duct fuel and 0.0102 lb/KWH
           with 100% diesel - test data)
                Dual fuel = 0.0202 x 10.95 x 10 KWH/Yr x 1/2000
```

= 110.6 tpy

```
NOx (cont)
               100% Diesel = 8.50×106 KWH/Yr x'0.0102 x 1/2000
                             = 43.3 +py
                            = 9.89 16/6-
Hydrocarbons (0.0007 lb/KWH dual fuel and 0.0005 lb/KWH
                     with 100% diesel - Test data)
           Emissions
               Dual fuel = 0.0007 x 10.95 x106 kwh/yr x 1/2000
                         = 3.8 tpy
= 0.88 16/hr
               100% Diesel = 0.0005 x 8.50 x 10 KWH/YF x 1/2000
                         = 2.1 +py
                         = 0.48/6/6-
CO(0.004216/kwh gas and 0.009016/kwh diesel-AP-42)
           日いいちろいいる
               Dual fuel = 10.95x10 ((0.0578x0.0090)+(0.9422x0.0042)]/2000
                          = 24.5tpy
= 5.616/40
              100% Diesel = 8.49x106(0.0090)/(2000)
                         = 38.2 tey
                          = 8.7 16/4~
302 (0.70210-616/KWhgas and 0.002816/KWH diesel-AP-42)
           Emission &
               Due 1 Pue 1 = 10.95x10 ((0.0028)(0.0578) + (0.7x10-6)(0.9422)]/2000
                          = 0.9 tpy
                          = 0.2 11/40
               100% Diese = 8.49x10 (0.0028)/2000
                           = 11.9 tpy
                           = 2.7 16/40
```

PM(NIl for gas 0.0030 IL /KWH

Emissions

Dual fuel = 10.95×10 (0+(0.0030)(0.0578)]/2000

0.9 tay 0.2 15/Lr

100% Diesel = 8.49×106 (0.0030)/2000

12.7 tpy

= 2.9 16/60 [.

## Engine # 3 - Worthington

Engine - 1900 brake horsepower Generator - 1350 KW

Heat input to generate 1 KW = 11, 800 BTU/KW
1350 KW = 15.93 × 106 BTV

1981-82 Operation

Time - 5453 hours Gas - 64.57x106 ft<sup>3</sup> diesel - 33.12x10<sup>3</sup> gal

Total Heat Input 1981-82 = 7.10 x 1010 BTU/5453 has

= 13.02 × 106 BTU/6-× 1/15.93 × 106

= 0.82 Capacity during numbing hours

## Emission Calculations (100% Capacity)

Generating Capacity = 1350 x 8760 = 11.83 x10 6 kw/yr = (13.95 x 10 " BTu/yr)

Fuel Consumption Dual fuel

Diesel @ 6 gal/hr

= 8760×6

= S2.56 x 10 3gel /yn

= (0.76 × 1010 BTU/yr) - 5.45%

Gas = 13.95 × 10 " - 0.76 × 10"

= 13.19x10" BTu/yr - 94.55%

x 1/1025

= 128.7×10 ft3/40

100% Diesel

= 80gal/hr x 8760

= 700.8 × 103 gal/yr

= (8.49 × 10 6 KW/yr)

```
42.381 SO SHEETS S SQUARE 42.382 100 SHEETS S SQUARE 42.389 200 SHEETS S SQUARE 42.389 200 SHEETS S SQUARE
```

```
NOx (0.0338 15 NOx/KWH with dual fuel and
        0.0102 15 NOx/KWH with 100% diesel from
        test data )
           Emissions
              Dual fuel = 11.83x10 x 0.0338x1/2000
                         = 199. 9 tpx
                         = 45.64 1L/hr
              100% diese = 8.50×10 × 0.0102 × 1/200
                         = 43.3 tpy
                         = 3.9016/hr
HC (0.0011 16 HC/KWH with dual fuel
       0.0005 IL HC/KWH with 100% diesel from
       test data)
          Emissions
              Dual fuel = 11-83×10 × 0.0011 × 1/2000
                        = 6.5 tpy
                         = 1.4815/40
              100% diesel = 8.50×106 x 0.0005 ×1/2000
                         = 2.1 tpy
                         = 0.48 16/hr
CO (AP-42)
          E missions
              Dual fuel = 11.83x10 (0.0545)(0.0090) + (0.9455)(0.0042)
                                   x1/2000
                         = 26.4 tpy
                         = 6.01L/hr
              100% diesel = 8.49 x10 (0.0090)/2000
                         = 38.2 tex
                          = 8.7 14/40
502 (AP-42)
              Duel Rel = 11.832106[0.0545(0.0028)+0.9455(0.7x106)]
                                  x 1/2000
                       = 0.9 toy
                       = 0.2 15/h
              100% diesel = 8.49x106 (0.0028) /2000
                        = 11.9 Itry
```

= 2.7 16/40.

Emission Calculations

# PM (AP-42)

Emissions

= 11.83×10 [0 + (0.0030)(0.0545)] /2000 Dual Fuel

= 1.0 toy

= 0.215/1

100% diesel= 8.49 x106 (0.0030)/2000

12.7 try 2.9 16/6-

# Engine # 4 - Worthington

Engine - 2452 brake horsepower Generator - 1750 KW

Heat Input to generate: 1 KW = 11,500 BTU/KW 1750 KW = 20.12 x 106 BTU

1981-82 Operations (4 months)

Time - 2820 hours

Gas - 49.61 × 10° ft³ gas

Diesel - 15.72 × 10³ gal diesel

Total Heat Input 1981-82
= 5.31 × 10" BTu/2820hrs
= 18.84 × 106 BTu/hr
× 1/20.12×106
= 0.94 Capacity during running Lours

## Emission Calculations (100% Capacity)

Generating Capacity = 1750×8760 = 15.33×106kw/yr = (17.63×1018 BT4/yr)

Fuel Consumption Dual fuel

Diesel @ 6 gal/hr = 8760 x 6 = 52.6 x 103 gal/yr = (0.76 x 100 stu/yr) - 4.31%

Gas = 17.63×101°-0.76×101° = 16.87×10'° BTU/Yr-95.69% × 1/1025 = 164.6×10° f+3/yr

100 % Diesel

= 120 gal/hr x 8760 = 1050x 103 gal/yr = (13.3 x 106 kw/yr)

Emission Calculations

NOx (0.0072 16 NOx / KWH with and finel and octob)

```
42-381 50 SHEETS 5 SQUARE 42-382 200 SHEETS 5 SQUARE 42-389 200 SHEETS 5 SQUARE
```

```
Emissions
                Duel fuel = 15.33 ×10° × 0.0072 × 1/2000
                           = .55.2 tex
                           = 12.60 15/40
                100% diesel = 13.3 x10 x 0.010 z x 1/2000
                           = 67.8 try
                           = 15.49 lb/hr
HC (0.0005 16 HC/KWH for both dual fuel and dressel; test date)
            Emissions
                Dual fuel = 15.33x106x0.0005x1/2000
                           = 7.8 tpy
                           = 0.00 16/40
                100% diesel = 13.3x106 x 0.0005 x 1/200
                              3.3 tpy
                           = 0.7516/40
CO (AP-42)
                Dual fuel = 15.33 x10 [(0.0431 \ \ 0.000) + (0.9569 \ \ (0.0042)]/2000
                            = 33.8 try
                            = 7.7 16/40
                100% diesel = 13.3×106(0.0070)(1/2000)
                           = 59.8 try
                           = 13.7 16/4-
502(AP-42)
                Duel Fel = 15.33 x10 [(0.0421)(0.0028) + (0.9569)(0.7x10-6)]/2000
                         = 0.9 tex
                         = 0.215/4-
                100% diesel = 13.3×10° (0.0028) (1/2000)
                          = 18.6 tex
                           = 4.2 15/h
PM(AP42)
                Duel fuel = [5.33 x10 [(0.0431)(0.0030) +0]/2000
                        = 1.0 tex
                        = 0.211/4-
               100% diesel = 13.3×106 (0.0030) (42000)
                           = 20.0 tex
                           = 4.6 16/4-
```

```
Engine # 5 - Worthington
      Engine - 3875 brake horsepower
     Generator - 2750 KW
      Heat Input to generate: 1 KW = 10,500 BTU/KW
                              2750 KW = 28.88 x10 6 BTU
      1981-82 Operations
                   None
Emission Calculations (100% Capacity)
     Generating Capacity = 2750 x 8760
                          = 24.09 × 10 6 KW/yr
                          = (25.29 x 10 " Bm/yr)
     Fuel Consumption
              Dual frel
                  Diesel @ 7 gel/hr
= 8760x7
                        = 61.32 × 103 gal/yr
                        = (0.89 × 1010 BTW/yr) - 3.52%
                  Gas = 25.29x10" - 0.89x10"
                                            - 96,48%
                        = 24.40 × 10' BT4
                            x 1/1025
                        = 238.0 x 10 + ft3/yr
               100% Diesel
                        = 150 gal/hr x 8760
                        = 1310 x 103 gal/yr
                        = (18.21 × 10 kw/yr)
      Emission Calculation
     NOx (0.0166 16 NOx/KWH with dual fuel; test data from
           engine # 6, and 0.0102 16 NOx/KWH with 100%
            diesel; test data from engine # 4)
               Emissions
                  Dual fuel = 24.09 x 10 x 0.0166 x 1/2000
                           = 199.9 tex
                           - 45.65 IL/4n
```

100 % diesel = 18.21x106 x 0.0102 x 1/2000

= 92.9 tpy = 21.2016/4~

```
42.389 30 SHEETS 5 SQUARE
42.382 100 SHEETS 5 SQUARE
47.389 200 SHEETS 5 SQUARE
```

```
HC (0.0013 lb HC/KWH with dual fuel; test data from
        engine +6, and 0.0005 ILHC/KWH with 100% diesel;
       test data from angine * 4)
            Emissions
                Dual feel = 24.09 x 106 x 0.0013 x 1/2000
                            = 15.7 try
                            = 3.58 16/40
                100% diesel = 18.21x106x0.0005x1/2000
                            = 4.6 tex
                             = 1.04 lb/h-
CO (AP-42)
                Dual fuel = 24.09x106[(0.0352)(0.0090)+(0.9648)(0.0042)]/2000
                           = 52.6 tpy
                           = 12.016/40
                100% diesel =18.21x10 (0.0090)/(2000)
                           2 B1.9+PY
                           = 18.7 16/40
502 (AP-42)
                Dual Puel = 24.09x10 [(0.0352)(0.0028)+(0.9648)(0.7x109)](200
                          = 1.2 try
                          = 0.3 15/4r
               100% diesel=18.21x106(0.0028)/(200)
                          = 25.5 try
                          = 5.8 16/ha
 PM (AP-42)
                Dual Fre 1 = 24.07x10 [(0.0352)(0.0030) + 0]/2000
                          = 1.3 tex
                          = 0.316/60
               100% diesel = 18.21 x 10 (0.0030) / (2000)
                          = 27.3 tex
                          = 6.216/hr
```

# Engine # 6 - Worthington

Eugine - 2700 brake horsepower Generator - 2137 KW

Heat Input to generate: 1KW = 11, 200 BTU/KW 2137KW = 23.93×10 BTU

1981-82 Operations (11 months)

Time - 3721 hours Gas - 71.38×106 ft3

Diesel - 27.39x103 gal

Total Hat Input 1981-82 = 7.72 × 1010 BTW /3721 hours = 20.73 × 10 6 BTW/40 × 1/23.93 × 106

= 0.87 Capacity during running hours

Emission Calculations (100% Capacity)

Generating Capacity = 2137 x 8760 = 18.72x 10° kw/yr = (20.97x10'° BTU/yr)

Fuel Consumption Dual fuel

Diesel @ 73-1/4n = 8760×7 = 61.32×103g-1/yn = (0.89×1010 BT4/yn) - 4.24%

Gas = 20.97 × 10" - 0.89 × 10"

= 20.08 × 10" BT4/yr- 95.76%

× 1/1025

= 195.9 × 10 ft //yr

100% Diesel = 140 gol/hr x8760 = 1230 x 103 gol/yr = (15.93 x 106 kw/yr)

Emission Calculations

Nox (0.0166 15 Nox/KWH with dual firel and 0.0102

Emission's

Dual fuel = 18.72 × 10° × 0. 0166 × 1/2000 = 155.4+py = 35.47 |6/40

```
NOx ( Con. +)
               100% Diesel = 15.93 x 10 ° x 0.0102 x 1/2000
                            = 81.2 tpy
                            = 18.55 11/hr
HC (0.0013 16 HC/KWH with dual frel and 0.0005
        16/KWH with 100% diesel; test date)
           Emi 531045
               Duel fuel = 18.72 × 10 ° × 0.0013 × 1/2000
                          = 12.2 tpy
                          = 2.78 16/60
               100% Diesel = 15.93 x 10 x 0.0005 x 1/2000
                           = 4.0 tex
                           = 0.91 16/hr
CO (AP-42)
           Emissions
                Dual fuel = 18.72 x 10 [(0.0424)(0.0090)+(0.95>6)(0.0042)]/200
                         = 41.2 tex
                          = >.4 15/hr
               100% Diesel = 13.93 x10 (0.0090)/(2000)
                          = 71.7 tpy
                           = 16.4/6/
502 (AP-42)
Emissions
               Duct fuel =18.72x10 [(0.042+)(0.0028)+(0.952/0.7x10-6)]/2000
                        = 1.1 tpy
                        = 0.3 11/4~
               100% Diese = 15.93 x 10 (0.0028)/(2000)
                          = 22.3 toy
                         = S. 113/hr
DM (AP-42)
           巨山1551045
               Duel fuel=18.72x106[(0.0424)(0.0030)+0]/2000
                        = 1.2 tox
                        = 0.3 13/4-
               100% Diesel = 15.93x 106 (0.0030)/(2000)
                          = 23.9 try
                          = S.S 16/4-
```

# Caterpillar Engines (9 Identical Units)

Engine - 775 brake horsepower

Generators - 500 KW (two engines operate Ain

Conditioning compressors

with comparable output)

Heat Input to generate: 1 KW = 13520 BTU 500 KW = 6.76×106BTU

1981-82 Operations (9 units total)

Time - 16,234 hours

Gas - 94.44 x 106 ft 3

Diesel - 0; engines operate 100% on gas

Total Heat Input 1981-82

= 94.44 x 106 ft3 x 1025 BT4 /ft3

= 9.68 x 10 10 BT4

= 5.96 x 106 BT4/hr

x 1/6.76 x 106

= 0.88 Capacity during running hours

# Emission Calculations (100% Capacity)

Generating Capacity = 500 x 8760 = 4.38 × 10° KW/yr/engine = 39.42 × 10° KW/yr/9 Engines

Fuel Consumption

Gas = 500 x 8760 x 13520 x 9 engines

= 53.30 x 10" BTM/YF, total

x 1/1025 BTM/FF>

= 519.9 x 10 = |ft3/YF, total 9 engines

Emission Calculations

NOx (0.0003 lb Nox/kw H with ges; test deta)

= 39.42×10° × 0.0003×1/2000

= 5.9 try; total 9 engines = 1.35 lb/hr

HC (0.000 2 lb HC/KWH with gas; test data)

= 39.42×10° x 0.0002×1/2000 = 3.9 tpy; total 9 engines = 0.90 16/hr

```
CO (AP-42)

= 39.42×10° (0.0042)/(2000)

= 82.8 + Py

= 18.9 lb/hr
```

# SUMMARY OF EMISSION CALCULATIONS

TABLE 1

# SUMMARY OF FUEL CONSUMPTION, GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES EXCEPT THE 9 CATERPILLARS WHEN OPERATING AT 100% CAPACITY ON DIESEL FUEL

	Fuel Diesel	Generating Capacity		Pollutant Emissions (tpy)					
Engine	(gal/yr)	(kw/yr)	NOx	НС	CO	\$0 <sub>2</sub>	PM		
1	700.8 x 10 <sup>3</sup>	8.49 x 10 <sup>6</sup>	43.3	2.1	38.2	11.9	12.7		
2	$700.8 \times 10^3$	$8.49 \times 10^{6}$	43.3	2.1	38.2	11.9	12.7		
3	700.8 x 10 <sup>3</sup>	8.49 x 10 <sup>6</sup>	43.3	2.1	38.2	11.9	12.7		
4	- 1050.0 x 103	13.3 x 106	67.8	3.3	59.8	18.6	20.0		
6 .5	1230.0 x 10 <sup>3</sup>	15.93 x 106	81.2	4.0	71.7	22.3	23.9		
.5	1310.0 x 10 <sup>3</sup>	18.21 x 10 <sup>6</sup>	92.9	4.6	81.9	25.5	27.3		
otal	5692.4 x 103	72.9 x 10 <sup>6</sup>	371.8	18.2	328.0	102.1	109.3		
mission	s Per 1,000 Hours		7.07	0.35	6.24	1.94	2.08		

TABLE 2

SUMMARY OF FUEL CONSUMPTION GENERATING CAPACITY AND EMISSIONS FOR ALL ENGINES WHEN OPERATING AT 100% CAPACITY ON DUAL FUEL

		Use	Generating	_				
	Gas	Diesel	Capacity			Emissions		
Engine 	(ft <sup>3</sup> /yr)	(gal/yr)	(kw/yr)	NOx	НС	CO	s0 <sub>2</sub>	PM
1	120.7 x 10 <sup>6</sup>	$52.6 \times 10^3$	10.95 x 10 <sup>6</sup>	67.3	4.4	24.5	0.9	0.9
2 3 4 6	$120.7 \times 10^6$	$52.6 \times 10^3$	$10.95 \times 10^6$	110.6	3.8	24.5	0.9	0.9
3	$128.7 \times 10^6$	$52.6 \times 10^3$	11.83 x 106	199.9	6.5	26.4	0.9	1.0
4	164.6 x 10 <sup>6</sup>	$52.6 \times 10^{3}$	15.33 x 10 <sup>6</sup>	55.2	3.8	33.8	0.9	1.0
6	195.9 x 106	61.3 x 10 <sup>3</sup>	18.72 x 106	155.4	12.2	41.2	1.1	1,2
7 Cats	$404.4 \times 10^6$	-0-	$30.66 \times 10^{6}$	4.6	3.0	64.4	0.1	0.0
5	238.0 x 106	61.3 x 10 <sup>3</sup>	24.09 x 10 <sup>b</sup>	199.9	15.7	52.6	1.2	1.3
Worthingtons	968.6 x 106	333.0 x 10 <sup>3</sup>	91.87 x 10 <sup>6</sup>	788.3	46.4	203.0	5.9	6.3
Caterpillars	$404.4 \times 10^6$	0	$30.66 \times 10^6$	4.6	3.0	64.4	0.1	0.0
Total	$1373.0 \times 10^6$	333.0 x 10 <sup>3</sup>	122.53 x 10 <sup>6</sup>	792.9	49.4	267.4	6.0	6.3
Emission Rate	e : Worthingto	nns		15.00	0.88	3.86	0.11	0.12
Per 1,000 Engine Hours	Caterpilla		•	0.07	0.05		0.001	0.0

# SECTION 2.0

CALCULATION OF EMISSION INCREASES FOR PROPOSED ADDITIONAL HOURS OF OPERATION

# Assume:

- 1. Caterpillars operate 40% of engine hours when engines operate on dual fuel
- 2. Worthingtons operate 60% of engine hours when engines operate on dual fiel
- 3. Engines operate 80% of total engine hours on dual fuel
- 4. Engines operate 20% of total engine hours on diesel fuel
- 5. Two Caterpillar engines used for our conditioning compressors operate a total of 3500 hours per year
- 6. Emissions from air conditioning Caterpillars at 100% capacity are the same as from generating Catopillars at 100% capacity.

# Emissions Calculation

1.0 Air Condituming Units 3 500 fotal hours 100% gas Ruel

```
NOx = (3.5 thousand hours) x 0.07 16/1000 hrs (Till Z) = 0. Z try
HC = (3.5) x 0.05 16/1000 hrs
                                                 = 0.2 try
CO = (3.5) × 1.05 16/1000 hrs
                                                 = 3.7.tpy
SO2 = (3.5) x 0.001 16/1000 hrs
                                                 = 40.1 tpy
PM = (3.5) x 0
                                                 = 0.0 tpy
```

20 Generating Units 727,700 hours total

2.1 Dual Fuel @ 80% of time = 27.700 ×0.8 = 22,160 hr/yr 2.1.1 Worthingtons @ 60% of time

= 22160 x0.6 = 13,296 hr/4m

NOx = (13.296 Housend hrs) x 1500 lb/1000 hrs (Table 2) = 199.4 tpx = 11.7 ter HC = (13.296) x 0.88

CO = (13.296 ) x 3.86

51.3 tpy ... 50¿± (13.296) × 0.11 1.5 tyy

PM - (13.296) x 0.12 1.6tpy

```
2.1.2 Caterpillars @ 40% of time
            = 22160 x 0. 4
            - BB64 hr/4-
         NOx = (8.864 thousand hrs) x 0.07 lb/1000hrs (Table 2) = 0.6 tpy
                                                        = 0.4 tex
         HC -(8.864) x 0.05
                                                        = 9.3 tpy
         CO = (8.864) x 1. 05
         502 = (8.864) × 0.001
                                                       = 40.1 tpy
          PM = (8.864) x 0
                                                       = 0.0 tex
2.2 Diesel fuel 20% of time
           = 27,7∞ x 0.7
           = 5540 ha /yr (all Worthingtons)
         NOx = (5.54 thousand hrs) (7.07 16/1000 hrs - Table 1) = 39.2 tox
         HC = (5.54) , 0.35
                                                       = 1.9 tex
         Co = (5.54) = 6.24
                                                       = 34.6 try
                                                       = 10.7 ty
          502 = (5.54) 1.94
                                                          11.5try
          Ph (s. s4) * 2.08
2.3 Dual fuel 100% of time
          Worthingtons - 60% of hours = 27700x0.6 = 166204r/yr
           Caterpillars - 40% of hours = 27700x0.4= 11 080hr/yr
     NOx = 16.620 (15.00 - Table 2) + 11.080 (0.07 - Table 2) = 250.1 tpy
     HC = 16.620 (0.88) + 11.080 (0.05)
     CO = 16.620 (3.86) + 11.080 (1.05)
     502 = 16.670 (0.11) + 11.080 (0.001)
                                                  = 1.9tpy
     PM = 16.620 (0.12) +
                                                      2.0+py
2.4 Generating Capacities
    2.4.1 Dual fuel 80%
              Worthingtons = (13296 hrs) (91.87x10 - Teble 2) 52560 operating hrs
                          = 23.24 × 10 6 KW/yr
             Caterpillars = (8864 hrs) (30.66 × 10 - Talier) /7x8760 total possible
                              4. 43 × 106 KW/40
   2.4.2 Diesel 20%
             Worthingtons = (5540 hr) (72.9x 106 - Table 1)/6x8760 total proserble
                         = 7.68 × 10 6 KW /40
   2.4.3 Dual Red 100%
            Worthingtons = 23.24 (100/80) x106 = 29.05 x106 KW/yr
             Caterpillars = 443 (100/80) x10 = 5.54x10 Ku/yr
```

# 2.5 Fuel Consumption

2.5.1 Dual fuel 80% of time

Gas: Worthingtons = [1329chrs)/(52560)] × >68.6×10°- Table 2

= 245.0×10° ft²/yr

Caterpillars = [(8864)/(7x8760)] x 404.4x10 - Tallez = 58.5x10 + ft3/yr

Diesel: Worthington, = [(13276)/(52560)] x 333.0x103 - Taller = 8424 x 103 gal/yr

2.5.2 Diesel fuel 20% of time

Diesel: Worthingtons = [(5540hr)/(6x820)] x 5692.4x103-Talle 1 = 600.0x103 gal/yr

2.5.3 Dual fact 100 % of time

Gas: Worthingtons = 245.0x10 (100/80) = 306.3x106

Caterpillars = 58.5 × 10° (100/00) = 73.1×10° f+2/yr

Diesel: Worthingtons = 84.24×10° (100/00) = 105.3×10° 
gel/yr

# 3.0 Calculation of Present Actual Emissions

Permitted hours of operation (ACIG-40548) = 23,379 lu/rr Permitted emissions based on dual finel firing 100% of time

# Example Calculations

Engine # 1

Actual hours of operation (normalized to total engine operating time of 23,379 hr/rr) = 2863 hr/rr

Engine #2

Actual operating hours = 3457 hr/yr

NOx = (3457/8760) (110.6 tpy @ 100% - Table ?)

= 43.6 tpy

# Summary

	Operating		Annual	Emissions	(tpy)	
Engine	(hr/yr)	Nox	нс	Co	So <sub>2</sub>	Ph
1	2863	22.0	1.4	9.3	0.2	0.3
2 3	3457	43.6	1.5	11.3	0.2	0.4
3	3295	75.2	2.4	11.4	0.2	0.3
4	1704	10.7	0.7	7.4	0.1	0.7
2	0	0	0	0	0	0
6	2249	39.9	3.1	11.6	0.2	0.3
9 Cats	9811	0.7	0.5	13.9	0.1	.0
Total	23,379	192.1	9.6	64.9	1.0	1.5

TABLE 3
PROPOSED INCREASES IN OPERATING RATES

			Annual Generating	Annual Operating	Annual Pollutant Emission Rate (tons per year)				
	Engines(s)	Fuel	Capacity (kw)	Time (hrs)	NOX	НС	ĊO	S0 <sub>2</sub>	PM
Increase from firing dual fuel 80% of the time and diesel fuel 20% of the time.	6 Worthingtons	Dual Diesel	23.24 x 10 <sup>6</sup> 7.68 x 10 <sup>6</sup>	13,296 5,540	199.4 39.2	11.7 1.9	51.3 34.6	1.5 10.7	1.6 11.5
	7 Caterpillars	Gas	$4.43 \times 10^6$	8,864	0.6	0.4	9.3	0.1	0.0
	2 Caterpillars (A/C)	Gas		3,500	0.2	0.2	3.7	<u>0.1</u>	0.0
Total			35.35 x 106	31,200	239.4	14.2	98.9	12.4	13.1
Increase from firing	6 Worthingtons	Dual	29.05 x 10 <sup>6</sup>	16,620	249.3	14.6	64.2	1.8	2.0
dual fuel 100% of the time	7 Caterpillars	Gas	5.54 x 10 <sup>6</sup>	11,080	0.8	0.6	11.6	0.1	0.0
	2 Caterpillars	Gas		3,500	0.2	0.2	3.7	0.0	0.0
Total			34.59 x 106	31,200	250.3	15.4	79.5	1.9	2.0
De minimus Emission In-	crease				40.0	40.0	100.0	40.0	25.0

TABLE 4

PROPOSED OPERATING CONDITIONS FOR ALL ENGINES;
EXISTING PLUS PROPOSED

	Annual Generating	Annual	Annual Fuel Co	Annual Fuel Consumption			Annual Emissions (tpy)			
Condition	Capacity (kw)	Operating Time (hrs)	Diesel (gal)	Gas (ft <sup>3</sup> )	NOx	нс	CO	so <sub>2</sub>	SO <sub>2</sub> PM	
Permitted/Actual	26.05 x 10 <sup>6(1)</sup>	23,379	100 x 103	290.5 x 10 <sup>6</sup>	192.1	9.6	64.9	1.0	1.5	
Increase Oual Fuel 100%							u-			
6 Worthingtons 7 Caterpillars 2 Caterpillars	29.05 x 10 <sup>6</sup> 5.54 x 10 <sup>6</sup> 0	16,620 11,080 3,500	105.3 x 10 <sup>3</sup>	306.3 x 106 73.1 x 106 23.1 x 106	249.3 0.8 0.2	14.6 0.6 0.2	64.2 11.6 3.7	1.8 0.1 0.0	2.0 0.0 0.0	
Total With Dual Fuel 100%	60.64 x 10 <sup>6</sup>	54,579	205,300	693.0 x 106	442.4	25.0	144.4	2.9	3.5	
Increase Oual 80% - Diesel 20%										
6 Worthingtons 7 Caterpillars 2 Caterpillars	30.92 x 10 <sup>6</sup> 4.43 x 10 <sup>6</sup> 0	18,836 8,864 3,500	684.2 x 10 <sup>3</sup>	245.0 x 106 58.5 x 106 23.1 x 106	238.6 0.6 0.2	13.6 0.4 0.2	85.9 9.3 3.7	12.2 0.1 0.0	13.1 0.0 0.0	
Total With Dual 80% - Diesel 20%	61.40 x 10 <sup>6</sup>	54,579	784,200	617.1 x 10 <sup>6</sup>	431.5	23.8	163.8	13.3	14.6	

<sup>(1)</sup> Based on heating value of present permitted fuel (3.12 x 1011 BTU/yr) and the average heat requirement to produce one kilowat of power from all engines (11,990 BTU/kw).

# GENERATING UNITS SUMMARY OF PROPOSED PERMIT CONDITIONS

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

## 1. Generating Units

	Ma	ximum Fuel Consumpt					
	Dual Fuel		100% Diesel	Brake	Generating	BTU Per	
Unit	Gas (ft <sup>3</sup> /hr)	Diesel (gal/hr)	Diesel (gal/hr)	Horsepower	Capacity	Kilowatt	
Worthingtons							
<i>#</i> 1	13,779	6	80	1,900	1,250	12,000	
#2	13,779	6	80	1,900	1,250	12,000	
#3	14.692	6	80	1,900	1,350	11,800	
#4	18,790	6	120	2,452	1.750	11,500	
<b>#</b> 5	27,169	7	150	3.875	2.750	10,500	
<b>#</b> 6	22,363	7	140	2,700	2,137	11,200	
Caterpillars			,				
7 Identical Units	6,594	0	0	775	500	13,520	

2. Maximum Annual Generating Capacity; All Units

 $61.0 \times 10^6 \text{ kw/yr}$ 

3. Maximum Number of Engine Hours

51,079 hrs/yr, total with the six Worthington engines permitted to operate up to 5,540 hrs/yr on 100% diesel fuel

4. Fuel Consumption

Diesel fuel: 784,200 gal/yr, maximum if Worthington engines

operate 5,540 hrs/yr on 100% diesel

Diesel fuel: 205,300 gal/yr, minimum if all engines are dual

fuel fired for 51,079 hrs/yr

Gas:  $669.9 \times 10^6 \text{ ft}^3/\text{yr}$ , maximum if all engines are dual

fuel fired for 51,079 hrs/yr

Gas:  $594.0 \times 10^6 \text{ ft}^3/\text{yr}$ , minimum if Worthington engines

operate 5,540 hrs/yr on 100% diesel

#### Emissions and Emission Increases

	Emissions (tpy)					
Pollutant	Maximum Increase	Maximum Total Emissions (1)				
NO <sub>X</sub> HC CO SO <sub>2</sub> PM <sup>2</sup>	250.1(2) 15.2(2) 95.2(3) 12.3(3) 13.1(3)	442.4(2) 25.0(2) 163.8(3) 13.3(3) 14.6(3)				

<sup>(1)</sup> Maximum emissions with generating units and air conditioning units operating at maximum proposed rates.

<sup>(2)</sup> With 100% dual fuel firing.

<sup>(3)</sup> With 80% dual fuel/20% diesel fuel firing.

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

## SUMMARY OF PROPOSED PERMIT CONDITIONS (Continued)

 Visible Emission Limits (based on Visible Emissions achievable under normal good operating practices - Determined by actual observation)

Unit	Fuel	VE
Worthington #1 Worthington #2 Worthington #3 Worthington #4 Worthington #5 Worthington #6	Dual Dual Dual Dual Dual Dual	10% 5% 5% 15% 10% 5%
Caterpillar All Worthingtons	Gas Diesel	5% 20%

# AIR CONDITIONING UNITS SUMMARY OF PROPOSED PERMIT CONDITIONS

# REGENCY SQUARE PROPERTIES DUVAL COUNTY, FLORIDA

Air Conditioning Units

Two gas fired Caterpillar engines rated at 775 brake horsepower each and used to drive air conditioning compressors

2. Maximum Annual Operating Time; Two Engines Total

3,500 full load hours per year; 7,000 actual operating hours at average operating capacity of 50%

3. Fue1

Natural gas at 100% of time;  $6,594~{\rm ft}^3~{\rm per}$  hour maximum consumption, each engine

4. Emissions and Emission Increases

	Emissions (tpy)					
Pollutant	Maximum Increase (1)	Maximum Total Emissions <sup>(2)</sup>				
NO <sub>X</sub> HC CO SO <sub>2</sub> PM	0.2 0.2 3.7 0.0 0.0	442.4(2) 25.0(2) 163.8(3) 13.3(3) 14.6(3)				

<sup>(1)</sup> Maximum emissions from two Caterpillar engines used to operate air conditioning compressors

5. Visible Emission Limits (based on Visible Emissions achievable under normal good operating practices)

<sup>(2)</sup> Maximum emissions with generating units and air conditioning units operating at maximum proposed rate

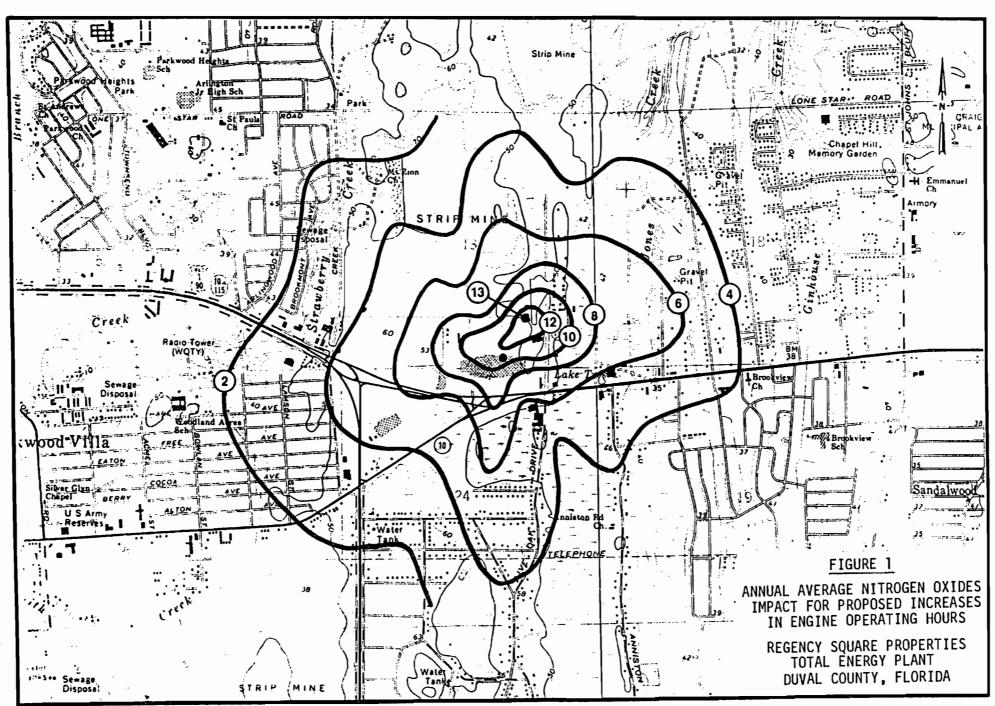
<sup>(3)</sup> With 100% dual fuel firing

<sup>(4)</sup> With 50% dual fuel/50% diesel fuel firing

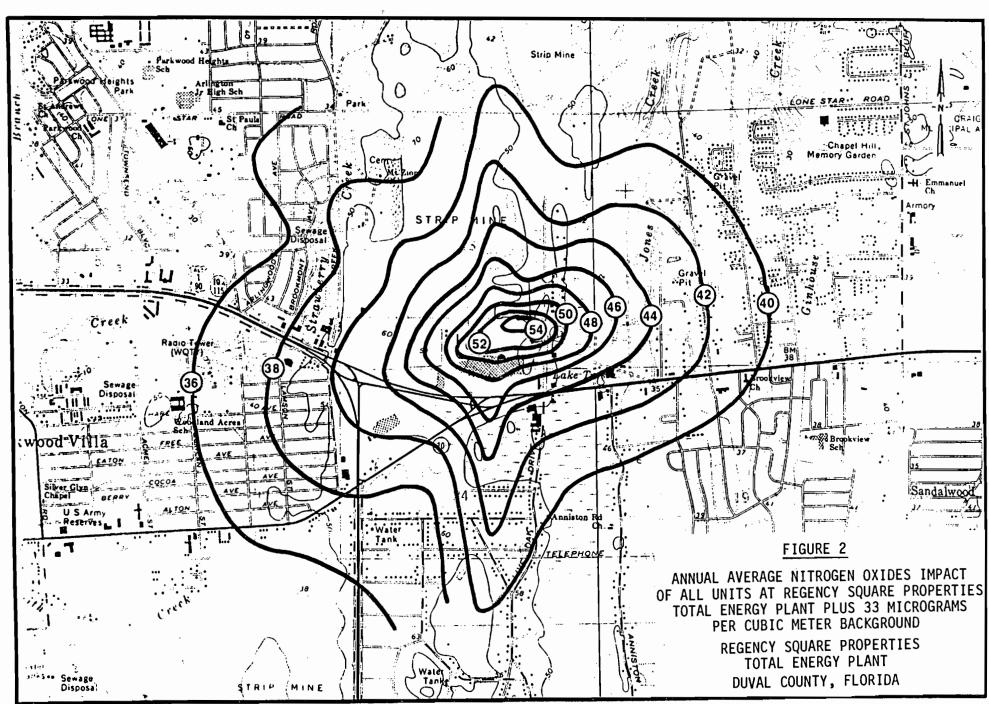
## ATTACHMENT 2

AIR QUALITY REVIEW OF NITROGEN OXIDES EMISSIONS

### **BEST AVAILABLE COPY**



#### **BEST AVAILABLE COPY**



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800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 800010046.0002 22 222222222 2222222222 32 3333333333333 3333333333 ZZZZZZZZZZZZZZZZZZZ DYLUWWWWWWWWWWWWW DYLUWWWWWWWWWWWWW 111 111 111 111 111 111 SSTART TAREST START TAREST STAR

\$\\\ \text{90} \\ 

#### - ISCLT INPUT DATA -

NUMBER OF SOURCES = 7NUMBER OF X AXIS GRID SYSTEM POINTS = NUMBER OF Y AXIS GRID SYSTEM POINTS = NUMBER OF SPECIAL POINTS = 0 NUMBER OF SEASONS = 1 NUMBER OF WIND SPEED CLASSES = 6 NUMBER OF STABILITY CLASSES = NUMBER OF WIND DIRECTION CLASSES = 16 FILE NUMBER OF DATA FILE USED FOR REPORTS = 1 THE PROGRAM IS RUN IN RURAL MODE CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07 ACCELERATION OF GRAVITY (METERS/SEC\*\*2) = 9.800 HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) = 6.100 ENTRAINMENT PARAMETER FOR UNSTABLE CONDITIONS = 0.600 ENTRAINMENT PARAMETER FOR STABLE CONDITIONS = 0.600 CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) = 0.0 DECAY COEFFICIENT =0.0 PROGRAM OPTION SMITCHES = 1, 1, 1, 0, 0, 3, 2, 2, 3, 2, 2, 0, 0, 0, 0, 0, 1, 1, 0, ALL SOURCES ARE USED TO FORM SOURCE COMBINATION 1 DISTANCE X AXIS GRID SYSTEM POINTS (METERS )= 0.0, 200.00, 400.00, 600.00, 800.00, 1000.00, 1200.00, 1400.00, 1600.00, 2200.00, 1800.00, 2000.00, 2400.00, 2800.00, 2600.00, DISTANCE Y AXIS GRID SYSTEM POINTS (METERS )= 0.0, 200.00, 400.00, 600.00, 800.00, 1000.00, 2400.00, 2600.00, 2800.00, 1200.00, 1400.00, 1600.00, 1800.00, 2000.00, 2200.00,

#### - AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

STABILITY STABILITY STABILITY STABILITY STABILITY STABILITY
CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6
SEASON 1 298.0000 298.0000 298.0000 298.0000

#### - MIXING LAYER HEIGHT (METERS) -

#### SEASON 1

WIND SPEED WIND SPEED

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

### STABILITY CATEGORY 1

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00027997	0.00020998	0.0	0.0	0.0	0.0
22.500	0.00004999	0.00004999	0.0	0.0	0.0	0.0
45.000	0.00008999	0.00010999	0.0	0.0	0.0	0.0
67.500	0.00010999	0.00012999	0.0	0.0	0.0	0.0
90.000	0.00008999	0.00010999	0.0	0.0	0.0	0.0
112.500	0.00024997	0.00023998	0.0	0.0	0.0	0.0
135.000	0.00022998	0.00025997	0.0	0.0	0.0	0.0
157.500	0.00004999	0.00004999	0.0	0.0	0.0	0.0
180.000	0.00062993	0.00049995	0.0	0.0	0.0	0.0
202.500	0.00024997	0.00028997	0.0	0.0	0.0	0.0
225,000	0.00048995	0.00044995	0.0	0.0	0.0	0.0
247.500	0.00042996	0.00049995	0.0	0.0	0.0	0.0
270.000	0.00039996	0.00028997	0.0	0.0	0.0	0.0
292.500	0.00013999	0.00015998	0.0	0.0	0.0	0.0
315.000	0.00011999	0.00007999	0.0	0.0	0.0	0.0
337.500	0.00023998	0.00010999	0.0	0.0	0.0	0.0

### SEASON 1

## STABILITY CATEGORY 2

WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
0.00182981	0.00149985	0.00044995	0.0	0.0	0.0
0.00083991	0.00086991	0.00020998	0.0	0.0	0.0
0.00160983	0.00183981	0.00081992	0.0	0.0	0.0
0.00189980	0.00415957	0.00207979	0.0	0.0	0.0
0.00235976	0.00476951	0.00426956	0.0	0.0	0.0
0.00231976	0.00431955	0.00436955	0.0	0.0	0.0
0.00305968	0.00529945	0.00421957	0.0	0.0	0.0
0.00202979	0.00255974	0.00091991	0.0	0.0	0.0
0.00262973	0.00284971	0.00099990	0.0	0.0	0.0
0.00144985	0.00197980	0.00096990	0.0	0.0	0.0
0.00190980	0.00289970	0.00178982	0.0	0.0	0.0
0.00168983	0.00210978	0.00173982	0.0	0.0	0.0
0.00157984	0.00297969	0.00149985	0.0	0.0	0.0
0.00119988	0.00154984	0.00123987	0.0	0.0	0.0
0.00146985	0.00168983	0.00070993	0.0	0.0	0.0
0.00078992	0.00107989	0.00033996	0.0	0.0	0.0
	CATEGORY 1 ( 0.7500MPS) 0.00182981 0.00083991 0.00160983 0.00189980 0.00235976 0.00231976 0.00305968 0.00202979 0.00262973 0.00144985 0.00190980 0.00168983 0.00157984 0.00119988 0.00146985	CATEGORY 1 CATEGORY 2 ( 0.7500MPS) ( 2.5000MPS) ( 0.00182981  0.00149985  0.00083991  0.00086991  0.00160983  0.00183981  0.00183980  0.00415957  0.00235976  0.00476951  0.00231976  0.00431955  0.00305968  0.00529945  0.00262979  0.00255974  0.00262973  0.00284971  0.00144985  0.00197980  0.00197980  0.00159984  0.00157984  0.00297969  0.00119988  0.00154984  0.00146985  0.00168983	CATEGORY 1 CATEGORY 2 CATEGORY 3 ( 0.7500MPS) ( 2.5000MPS) ( 4.3000MPS) ( 0.00182981  0.00149985  0.00044995  0.00083991  0.00020998  0.00160983  0.00183981  0.00081992  0.00189980  0.00415957  0.00207979  0.00235976  0.00476951  0.00426956  0.00231976  0.00431955  0.00436955  0.00305968  0.00529945  0.00421957  0.00202979  0.00255974  0.00091991  0.00262973  0.00284971  0.00099990  0.00144985  0.00197980  0.00096990  0.00190980  0.00289970  0.00178982  0.00157984  0.00297969  0.00173982  0.00157984  0.00297969  0.00149985  0.00119988  0.00154984  0.00123987  0.00146985  0.00168983  0.00070993	CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 ( 0.7500MPS) ( 2.5000MPS) ( 4.3000MPS) ( 6.8000MPS) ( 0.00182981 0.00149985 0.000020998 0.0 0.00160983 0.00183981 0.00081992 0.0 0.00189980 0.00415957 0.00207979 0.0 0.00235976 0.00476951 0.00426956 0.0 0.00231976 0.00431955 0.00436955 0.0 0.00305968 0.00529945 0.00421957 0.0 0.00202979 0.00255974 0.00091991 0.0 0.00262973 0.00284971 0.00091991 0.0 0.00144985 0.00197980 0.00096990 0.0 0.00190980 0.00289970 0.00178982 0.0 0.00168983 0.00210978 0.00173982 0.0 0.00157984 0.00297969 0.00173985 0.0 0.00119988 0.00154984 0.00123937 0.0 0.00146985 0.00168983 0.00154984 0.00123937 0.0 0.00146985 0.00168983 0.00168983 0.00070993 0.0	CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 ( 0.7500MPS) ( 2.5000MPS) ( 4.3000MPS) ( 6.8000MPS) ( 9.5000MPS) ( 0.00182981 0.00149985 0.00044995 0.0 0.0 0.0 0.00183991 0.00086991 0.00020998 0.0 0.0 0.0 0.00160983 0.00183981 0.00081992 0.0 0.0 0.0 0.00189980 0.00415957 0.00207979 0.0 0.0 0.0 0.00235976 0.00476951 0.00426956 0.0 0.0 0.0 0.00231976 0.00431955 0.00436955 0.0 0.0 0.0 0.00305968 0.00529945 0.00421957 0.0 0.0 0.0 0.00202979 0.00255974 0.00091991 0.0 0.0 0.0 0.00262973 0.00284971 0.00099990 0.0 0.0 0.0 0.00144985 0.00197980 0.00096990 0.0 0.0 0.0 0.00190980 0.00289970 0.00178982 0.0 0.0 0.0 0.0 0.00157984 0.00297969 0.00173982 0.0 0.0 0.0 0.0 0.00157984 0.00297969 0.00149985 0.0 0.0 0.0 0.0 0.00119988 0.00154984 0.00123987 0.0 0.0 0.0 0.0 0.00146985 0.00168983 0.00070993 0.0 0.0 0.0 0.0 0.00146985 0.00168983 0.00070993 0.0 0.0 0.0

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

### SEASON 1

### STABILITY CATEGORY 3

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00064993	0.00239975	0.00133986	0.00012999	0.0	0.0
22.500	0.00073992	0.00191980	0.00133986	0.00007999	0.0	0.0
45.000	0.00065993	0.00223977	0.00320967	0.00070993	0.00003000	0.0
67.500	0.00075992	0.00373961	0.00634934	0.00249974	0.00004999	0.0
90.000	0.00062993	0.00244975	0.00982899	0.00397959	0.0	0.0
112.500	0.00067993	0.00262973	0.00760921	0.00323967	0.00003000	0.00003000
135.000	0.00118988	0.00434955	0.00655932	0.00281971	0.00004999	0.0
157.500	0.00078992	0.00281971	0.00320967	0.00041996	0.0	0.0
180.000	0.00164983	0.00447954	0.00326966	0.00004999	0.0003000	0.0
202.500	0.00056994	0.00220977	0.00218977	0.00031997	0.0	0.0
225.000	0.00060994	0.00281971	0.00492949	0.00096990	0.00017998	0.0
247.500	0.00076992	0.00315967	0.00560942	0.00110989	0.00015998	0.00003000
270.000	0.00061994	0.00284971	0.00539944	0.00125987	0.00010999	0.0
292.500	0.00044995	0.00176982	0.00291970	0.00089991	0.00004999	0.00003000
315.000	0.00041996	0.00199979	0.00257973	0.00049995	0.0	0.0
337.500	0.00043995	0.00139986	0.00125987	0.00004999	0.0	0.0

### SEASON 1

## STABILITY CATEGORY 4

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
DIRECTION		( 2.5000MPS)				(12.5000MPS)
	( 0./Jours/	( 2.5000nF3/	( 4.3000FF3/	( 0.0000nrs/	( 3.5000nrs/	(12.5000005)
(DEGREES)						
0.0	0.00256974	0.00652933	0.01237872	0.00523946	0.00012999	0.00003000
22.500	0.00105989	0.00347964	0.00816916	0.00897907	0.00091991	0.00007999
45.000	0.00089991	0.00386960	0.01077889	0.01546841	0.00260973	0.00033996
67.500	0.00130986	0.00484950	0.00863911	0.01195877	0.00089991	0.0
90.000	0.00148985	0.00463952	0.00850912	0.01098887	0.00039996	0.00003000
112.500	0.00082991	0.00326966	0.00515947	0.00576941	0.00025997	0.00010999
135,000	0.00093990	0.00371962	0.00642934	0.00760921	0.00039996	0.00007999
157.500	0.00085991	0.00299969	0.00484950	0.00347964	0.00036996	0.00003000
180.000	0.00149985	0.00592939	0.01216874	0.00811916	0.00033996	0.0
202.500	0.00126987	0.00421957	0.00876909	0.00560942	0.00031997	0.00003000
225.000	0.00121987	0.00479950	0.01034893	0.00863911	0.00094990	0.00003000
247.500	0.00104989	0.00439955	0.00940903	0.00911906	0.00123987	0.00015998
270.000	0.00125987	0.00413957	0.00858911	0.01119884	0.00247974	0.00078992
292.500	0.00109989	0.00284971	0.00489949	0.00911906	0.00249974	0.00044995
315.000	0.00126987	0.00352964	0.00608937	0.00787919	0.00136986	0.00015998
337,500	0.00105989	0.00297969	0.00508947	0.00360963	0.00015998	0.00003000

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

#### STABILITY CATEGORY 5

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.3000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.01783815	0.01635831	0.00550943	0.0	0.0	0.0
22.500	0.00617936	0.00513947	0.00199979	0.0	0.0	0.0
45.000	0.00610937	0.00576941	0.00215978	0.0	0.0	0.0
67.500	0.00702927	0.00747923	0.00160983	0.0	0.0	0.0
90.000	0.00481950	0.00547943	0.00104989	0.0	0.0	0.0
112.500	0.00335965	0.00310968	0.00073992	0.0	0.0	0.0
135.000	0.00676930	0.00608937	0.00078992	0.0	0.0	0.0
157.500	0.00592939	0.00534945	0.00133986	0.0	0.0	0.0
180.000	0.01437852	0.01527843	0.00336965	0.0	0.0	0.0
202.500	0.00977899	0.01145882	0.00281971	0.0	0.0	0.0
225.000	0.01455850	0.01498845	0.00397959	0.0	0.0	0.0
247.500	0.01486846	0.01546841	0.00616936	0.0	0.0	0.0
270.000	0.01997794	0.01712823	0.00637934	0.0	0.0	0.0
292.500	0.01600835	0.01090888	0.00442954	0.0	0.0	0.0
315.000	0.01427853	0.01150881	0.00539944	0.0	0.0	0.0
337.500	0.01074839	0.00969900	0.00428956	0.0	0.0	0.0

- VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6 STABILITY CATEGORY 10.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 20.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 30.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 40.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 50.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.

#### - WIND PROFILE POWER LAW EXPONENTS -

WIND SPEED WIND SPEED

## - SOURCE INPUT DATA -

C T SOURCE SOURCE X A A NUMBER TYPE COORDINATE COO R P (M) D E		/ - SOURCE DETAILS DEPENDING ON TYPE -
X 1 STACK 1450.00	1450.00 12.80 0.0	GAS EXIT TEMP (DEG K) = 444.00, GAS EXIT VEL. (M/SEC) = 18.70, STACK DIAMETER (M) = 0.460, HEIGHT OF ASSO. BLDG. (M) = 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4 8.50000E-01
		1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K) = 472.00, GAS EXIT VEL. (M/SEC) = 20.00,  STACK DIAMETER (M) = 0.460, HEIGHT OF ASSO. BLDG. (M) = 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4  8.50000E-01
		1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K) = 477.00, GAS EXIT VEL. (M/SEC) = 19.20,  STACK DIAMETER (M) = 0.460, HEIGHT OF ASSO. BLDG. (M) = 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4
		9.20000E-01 1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K)= 741.00, GAS EXIT VEL. (M/SEC)= 25.60, STACK DIAMETER (M)= 0.460, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF  ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4
WARNING - DISTANCE BETWEEN SOURCE X 5 STACK 1450.00		1.20000E+00 1400.00, 1400.00 IS LESS THAN PERMITTED GAS EXIT TEMP (DEG K)= 525.00, GAS EXIT VEL. (M/SEC)= 17.10, STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4
WARNING - DISTANCE BETWEEN SOURCE X 6 STACK 1450.00		1.88000E+00 1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K)= 525.00, GAS EXIT VEL. (M/SEC)= 17.10, STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4 1.46000E+00
WARNING - DISTANCE BETWEEN SOURCE	6 AND POINT X,Y=	1400.00, 1400.00 IS LESS THAN PERMITTED

- SOURCE INPUT DATA (CONT.) -

C T SOURCE SOURCE X Υ EMISSION BASE / - SOURCE DETAILS DEPENDING ON TYPE -A A NUMBER TYPE COORDINATE COORDINATE HEIGHT ELEV-/ RP (M) (M) (M) ATION / DΕ (M) / 0.0 GAS EXIT TEMP (DEG K)= 597.00, GAS EXIT VEL. (M/SEC)= 23.50, χ 7 STACK 1450.00 1450.00 10.00 STACK DIAMETER (M)= 0.220, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) -SEASON 3 SEASON 1 SEASON 2 3.00000E-02 WARNING - DISTANCE BETWEEN SOURCE 7 AND POINT X, Y= 1400.00, 1400.00 IS LSS THAN PERMITTED

** AN	INUAL GROUND LEVE	L CONCENTRATIO	- 6	S PER CUBIC M RID SYSTEM RE XIS (DISTANCE	CEPTORS -	) FROM AL	L Sources com	BINED	**
Y AXIS (DIST	0.0 TANCE , MET	200,000 ERS )	400.000	600.000	800.000 TRATION -	1000.000	1200.000	1400.000	1600.000
2000 00		1 005/01	2.041100	2 047000	1 004050	2 442745	2 424022	A ALISOT	4.283511
2800.00 2600.00		1.995601 2.148549	2.041190 2.369042	2.047003 2.403623	1.994258 2.359915	2.442745 2.390412	3.434033 3.647339	4.466537 5.004175	4.757543
2400.00		2.149625	2.582117	2.868212	2.355104	2.637268	3.784426	5.613816	<b>5.</b> 271813
2200.00		2.147625	2.565835	3.178158	3.554577	3.365447	3.735434	6.308161	5.817279
2000.00		1.958776	2.453612	3.178138	4.021984	3.363447 4.527171	3.735 <del>4</del> 34 3.877971	7.387547	6.607911
1800.00		2.281459	2.585358	2.920560	3.910434	5.513875	6.161447	8.632833	7.568739
1600.00		2.697419	3.172311	3.776304	4.627975	5.777390	7.934425	6.476625	12.560444
1400.00		3.013257	3.610662	4.415546	5.660119	7.695525	10.181498	0.0	10.955350
1200.00		3.101438	3.686240	4.440708	5.505802	6.769786	7.789158	8.413429	7.392497
1000.00		3.111475	3.626419	4.120581	4.652256	5.252084	4.874152	7.745022	5.785878
800.00		2.909463	3.237100	3.591068	3.925459	3.881048	3.791958	6.618033	5.455221
600.00		2.628235	2.870780	3.115129	3.194764	3.109692	3.771736	5.935232	5.161699
400.00		2.361510	2.538905	2.637961	2.665284	2.589096	3.891857	5.454880	4.397604
200.00		2.115993	2.211628	2.270753	2.274929	2.593311	3.737257	4.948577	4.535992
0.0	1.794972	1.883416	1.944863	1.979954	1.973404	2.605927	3.535610	4.492828	4.178651
·			<del>-</del> 6	rid system re	Ceptors -				
			- X A	XIS (DISTANCE	, METERS) -				
	1800.000	2000.000	2200.000	2400.000	2600.000	2800.000			
Y AXIS (DIST	ANCE , MET	ERS )		- CONCEN	TRATION -			•	
			·						
2800.00		3.102533	3.247251	3.344109	3.363338	3.325935			•
2600.00		3.608261	3.802687	3.881137	3.861066	3.597664			
2400.00		4.314506	4.507036	4.534835	4.191001	3.861408			
2200.00	A 700E00	C A44CAS	- 44-044						
2000,00		5.240527	5.417911	4.956731	4.530397	4.135124			
	0 6.216679	6.544567	5.941800	5.397329	4.873219	4.408661			
1800.00	0 6.216679 0 8.874733	6.544567 7.499039	5.941800 6.526104	5.397329 5.871996	4.873219 5.289394	4.408661 4.795828			
1800.00 1600.00	0 6.216679 0 8.874733	6.544567 7.499039	5.941800	5.397329	4.873219	4.408661			
	0 6.216679 0 8.874733 0 11.005967	6.544567 7.499039	5.941800 6.526104	5.397329 5.871996	4.873219 5.289394	4.408661 4.795828			
1600.00	6.216679 0 8.874733 0 11.005967 0 10.753844	6.544567 7.499039 8.613557	5.941800 6.526104 7.173015	5.397329 5.871996 6.390636	4.873219 5.289394 5.736457	4.408661 4.795828 5.161106			
1600.00 1400.00	0 6.216679 0 8.874733 0 11.005967 0 10.753844 0 7.302958	6.544567 7.499039 8.613557 8.538603	5.941800 6.526104 7.173015 7.181726	5.397329 5.871996 6.390636 6.461384	4.873219 5.289394 5.736457 5.823814	4.403661 4.795828 5.161106 5.246008			
1600.00 1400.00 1200.00	0 6.216679 0 8.874733 0 11.005967 0 10.753844 0 7.302958 0 5.691787	6.544567 7.499039 8.613557 8.538603 5.813454	5.941800 6.526104 7.173015 7.181726 5.437823	5.397329 5.871996 6.390636 6.461384 5.276497	4.873219 5.289394 5.736457 5.823814 4.961368	4.403661 4.795828 5.161106 5.246008 4.602921			
1600.00 1400.00 1200.00 1000.00	0 6.216679 0 8.874733 0 11.005967 0 10.753844 0 7.302958 0 5.691787 0 4.317624	6.544567 7.499039 8.613557 8.538603 5.813454 5.388556	5.941800 6.526104 7.173015 7.181726 5.437823 4.829256	5.397329 5.871996 6.390636 6.461384 5.276497 4.466591	4.873219 5.289394 5.736457 5.823814 4.961368 4.163309	4.403661 4.795828 5.161106 5.246008 4.602921 3.976952			
1600.00 1400.00 1200.00 1000.00 800.00	0 6.216679 0 8.874733 0 11.005967 0 10.753844 0 7.302958 0 5.691787 0 4.317624 0 3.636060	6.544567 7.499039 8.613557 8.538603 5.813454 5.388556 4.697475	5.941800 6.526104 7.173015 7.181726 5.437823 4.829256 4.613563	5.397329 5.871996 6.390636 6.461384 5.276497 4.466591 4.224966	4.873219 5.289394 5.736457 5.923814 4.961368 4.163309 3.885516	4.408661 4.795828 5.161106 5.246008 4.602921 3.976952 3.576475			
1600.00 1400.00 1200.00 1000.00 800.00 600.00	0 6.216679 0 8.874733 0 11.005967 0 10.753844 0 7.302958 0 5.691787 0 4.317624 0 3.636060 0 3.696042	6.544567 7.499039 8.613557 8.538603 5.813454 5.388556 4.697475 3.955346	5.941800 6.526104 7.173015 7.181726 5.437823 4.829256 4.613563 4.115917	5.397329 5.871996 6.390636 6.461384 5.276497 4.466591 4.224966 3.969112	4.873219 5.289394 5.736457 5.823814 4.961368 4.163309 3.885516 3.664273	4.408661 4.795828 5.161106 5.246008 4.602921 3.976952 3.576475 3.387761			

\*\* ANNUAL GROUND LEVEL CONCENTRATION ( MICROGRAMS PER CUBIC METER

) FROM ALL SOURCES COMBINED (CONT.) \*\*

- PROGRAM DETERMINED MAXIMUM 10 VALUES -

X Y CONCENTRATION COORDINATE COORDINATE

(METERS)	(METERS )	
1600.00	1600.00	12.560444
1800.00	1600.00	11.005967
1600.00	1400.00	10.955350
1800.00	1400.00	10.753844
1200.00	1400.00	10.181498
1800.00	1800.00	8.874733
1400.00	1800.00	8.632833
2000.00	1600.00	8.613557
2000.00	1400.00	8.53863
1400.00	1200.00	8.413429

#### - ISCLT INPUT DATA -

NUMBER OF SOURCES = 7 NUMBER OF X AXIS GRID SYSTEM POINTS = NUMBER OF Y AXIS GRID SYSTEM POINTS = 15 NUMBER OF SPECIAL POINTS = NUMBER OF SEASONS = 1 NUMBER OF WIND SPEED CLASSES = 6 NUMBER OF STABILITY CLASSES = 5 NUMBER OF WIND DIRECTION CLASSES = 16 FILE NUMBER OF DATA FILE USED FOR REPORTS = 1 THE PROGRAM IS RUN IN RURAL MODE CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07 ACCELERATION OF GRAVITY (METERS/SEC\*\*2) = 9.800 HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) = 6.100 ENTRAINMENT PARAMETER FOR UNSTABLE CONDITIONS = 0.600 ENTRAINMENT PARAMETER FOR STABLE CONDITIONS = 0.600 CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) = 0.0 DECAY COEFFICIENT =0.0 PROGRAM OPTION SWITCHES = 1, 1, 1, 0, 0, 3, 2, 2, 3, 2, 2, 0, 0, 0, 0, 0, 0, 1, 1, 0, ALL SOURCES ARE USED TO FORM SOURCE COMBINATION 1 DISTANCE X AXIS GRID SYSTEM POINTS (METERS )= 400.00, 600.00, 800.00, 1000.00, 0.0 , 200.00, 2200.00, 2400.00, 2600.00, 2800.00, 1200.00, 1400.00, 1600.00, 1800.00, 2000.00, DISTANCE Y AXIS GRID SYSTEM POINTS (METERS )= 400.00, 600.00, 800.00, 1000.00, 0.0 , 200.00, 2400.00, 2600.00, 2800.00, 1400.00, 1600.00, 1800.00, 2000.00, 2200.00, 1200.00,

#### - AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

STABILITY STABILITY STABILITY STABILITY STABILITY STABILITY
CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6
SEASON 1 298.0000 298.0000 298.0000 298.0000

#### - MIXING LAYER HEIGHT (METERS) -

#### SEASON 1

WIND SPEED WIND SPEED

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

## STABILITY CATEGORY 1

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00027997	0.00020998	0.0	0.0	0.0	0.0
22.500	0.00004999	0.00004999	0.0	0.0	0.0	0.0
45.000	0.00008999	0.00010999	0.0	0.0	0.0	0.0
67.500	0.00010999	0.00012999	0.0	0.0	0.0	0.0
90.000	0.00008999	0.00010999	0.0	0.0	0.0	0.0
112.500	0.00024997	0.00023998	0.0	0.0	0.0	0.0
135.000	0.00022998	0.00025997	0.0	0.0	0.0	0.0
157.500	0.00004999	0.00004999	0.0	0.0	0.0	0.0
180.000	0.00062993	0.00049995	0.0	0.0	0.0	0.0
202.500	0.00024997	0.00028997	0.0	0.0	0.0	0.0
225.000	0.00048995	0.00044995	0.0	0.0	0.0	0.0
247.500	0.00042996	0.00049995	0.0	0.0	0.0	0.0
270.000	0.00039996	0.00028997	0.0	0.0	0.0	0.0
292.500	0.00013999	0.00015998	0.0	0.0	0.0	0.0
315.000	0.00011999	0.00007999	0.0	0.0	0.0	0.0
337.500	0.00023998	0.00010999	0.0	0.0	0.0	0.0

### SEASON 1

## STABILITY CATEGORY 2

	MIND SPEED	WIND SPEED				
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00182981	0.00149985	0.00044995	0.0	0.0	0.0
22.500	0.00083991	0.00086991	0.00020998	0.0	0.0	0.0
45.000	0.00160983	0.00183981	0.00081992	0.0	0.0	0.0
67.500	0.00189980	0.00415957	0.00207979	0.0	0.0	0.0
90.000	0.00235976	0.00476951	0.00426956	0.0	0.0	0.0
112.500	0.00231976	0.00431955	0.00436955	0.0	0.0	0.0
135.000	0.00305968	0.00529945	0.00421957	0.0	0.0	0.0
157.500	0.00202979	0.00255974	0.00091991	0.0	0.0	0.0
180.000	0.00262973	0.00284971	0.00099990	0.0	0.0	0.0
202.500	0.00144985	0.00197980	0.00096990	0.0	0.0	0.0
225.000	0.00190980	0.00289970	0.00178982	0.0	0.0	0.0
247.500	0.00168983	0.00210978	0.00173982	0.0	0.0	0.0
270.000	0.00157984	0.00297969	0.00149985	0.0	0.0	0.0
292.500	0.00119988	0.00154934	0.00123987	0.0	0.0	0.0
315,000	0.00146985	0.00168983	0.00070993	0.0	0.0	0.0
337.500	0.00078992	0.00107989	0.00033996	0.0	0.0	0.0

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

### SEASON 1

## STABILITY CATEGORY 3

	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	(9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00064993	0.00239975	0.00133986	0.00012999	0.0	0.0
22.500	0.00073992	0.00191980	0.00133986	0.00007999	0.0	0.0
45.000	0.00065993	0.00223977	0.00320967	0.00070993	0.00003000	0.0
67.500	0.00075992	0.00373961	0.00634934	0.00249974	0.00004999	0.0
90.000	0.00062993	0.00244975	0.00982899	0.00397959	0.0	0.0
112.500	0.00067993	0.00262973	0.00760921	0.00323967	0.00003000	0.00003000
135,000	0.00118988	0.00434955	0.00655932	0.00281971	0.00004999	0.0
157.500	0.00078992	0.00281971	0.00320967	0.00041996	0.0	0.0
180.000	0.00164983	0.00447954	0.00326966	0.00004999	0.00003000	0.0
202.500	0.00056994	0.00220977	0.00218977	0.00031997	0.0	0.0
225.000	0.00060994	0.00281971	0.00492949	0.00096990	0.00017998	0.0
247.500	0.00076992	0.00315967	0.00560942	0.00110989	0.00015998	0.00003000
270.000	0.00061994	0.00284971	0.00539944	0.00125987	0.00010999	0.0
292.500	0.00044995	0.00176982	0.00291970	0.00089991	0.00004999	0.00003000
315.000	0.00041996	0.00199979	0.00257973	0.00049995	0.0	0.0
337.500	0.00043995	0.00139986	0.00125987	0.00004999	0.0	0.0

### SEASON 1

### STABILITY CATEGORY 4

	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	(0.7500MPS)	( 2.5000MRS)	(.4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00256974	0.00652933	0.01237872	0.00523946	0.00012999	0.00003000
22.500	0.00105989	0.00347964	0.00816916	0.00897907	0.00091991	0.00007999
45.000	0.00089991	0.00386960	0.01077889	0.01546841	0.00260973	0.00033996
67.500	0.00130986	0.00484950	0.00863911	0.01195977	0.00089991	0.0
90.000	0.00148985	0.00463952	0.00850912	0.01098887	0.00039996	0.00003000
112.500	0.00082991	0.00326966	0.00515947	0.00576941	0.00025997	0.00010999
135.000	0.00093990	0.00371962	0.00642934	0.00760921	0.00039996	0.00007999
157.500	0.00085991	0.00299969	0.00484950	0.00347964	0.00036996	0.00003000
180.000	0.00149985	0.00592939	0.01216874	0.00811916	0.00033996	0.0
202.500	0.00126987	0.00421957	0.00876909	0.00560942	0.00031997	0.00003000
225,000	0.00121987	0.00479950	0.01034893	0.00863911	0.00094990	0.0 003000
247.500	0.00104989	0.00439955	0.00940903	0.00911906	0.00123987	0.00015998
270.000	0.00125987	0.00413957	0.00858911	0.01119884	0.00247974	0.00078992
292.500	0.00109989	0.00284971	0.00489949	0.00911906	0.00249974	0.00044995
315.000	0.00126987	0.00352964	0.00608937	0.00787919	0.00136986	0.00015998
337.500	0.00105989	0.00297969	0.00508947	0.00360963	0.00015998	0.00003000

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

#### STABILITY CATEGORY 5

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.01788315	0.01635831	0.00550943	0.0	0.0	0.0
22.500	0.00617936	0.00513947	0.00199979	0.0	0.0	0.0
45.000	0.00610937	0.00576941	0.00215978	0.0	0.0	0.0
67.500	0.00702927	0.00747923	0.00160983	0.0	0.0	0.0
90.000	0.00481950	0.00547943	0.00104989	0.0	0.0	0.0
112.500	0.00335965	0.00310968	0.00073992	0.0	0.0	0.0
135.000	0.00676930	0.00608937	0.00078992	0.0	0.0	0.0
157.500	0.00592939	0.00534945	0.00133986	0.0	0.0	0.0
180.000	0.01437852	0.01527843	0.00336965	0.0	0.0	0.0
202.500	0.00977399	0.01145882	0.00281971	0.0	0.0	0.0
225.000	0.01455850	0.01498845	0.00397959	0.0	0.0	0.0
247.500	0.01486846	0.01546841	0.00616936	0.0	0.0	0.0
270.000	0.01997794	0.01712823	0.00637934	0.0	0.0	0.0
292.500	0.01600835	0.01090838	0.00442954	0.0	0.0	0.0
315,000	0.01427853	0.01150881	0.00539944	0.0	0.0	0.0
337.500	0.01074889	0.00969900	0.00428956	0.0	0.0	0.0

- VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6 0.0 0.0 STABILITY CATEGORY 10.0 0.0 0.0 0.0 STABILITY CATEGORY 20.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 30.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 40.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 50.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.2000E-010.2000E-010.2000E-010.2000E-010.20000E-010.20000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E

#### - WIND PROFILE POWER LAW EXPONENTS -

WIND SPEED WIND SPEED

## - SOURCE INPUT DATA -

C T SOURCE SOURCE X A A NUMBER TYPE COORDINATE COOR R P (M) D E	RDINATE HEIGHT ELEV-	/ - SOURCE DETAILS DEPENDING ON TYPE -
X 1 STACK 1450.00	1450.00 12.30 0.0	GAS EXIT TEMP (DEG K)= 444.00, GAS EXIT VEL. (M/SEC)= 18.70, STACK DIAMETER (M)= 0.460, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4 1.50000E+00
		1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K) = 472.00, GAS EXIT VEL. (M/SEC) = 20.00,  STACK DIAMETER (M) = 0.460, HEIGHT OF ASSO. BLDG. (M) = 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4  1.50000E+00
		1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K)= 477.00, GAS EXIT VEL. (M/SEC)= 19.20,  STACK DIAMETER (M)= 0.460, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4  1.63000E+00
		1400.00, 1400.00 IS LESS THAN PERMITTED  GAS EXIT TEMP (DEG K) = 741.00, GAS EXIT VEL. (M/SEC) = 25.60,  STACK DIAMETER (M) = 0.460, HEIGHT OF ASSO. BLDG. (M) = 8.20, WIDTH OF  ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1  - SOURCE STRENGTHS ( GRAMS PER SEC ) -  SEASON 1 SEASON 2 SEASON 3 SEASON 4
		2.12000E+00 1400.00, 1400.00 IS LESS THAN PERMITTED GAS EXIT TEMP (DEG K)= 525.00, GAS EXIT VEL. (M/SEC)= 17.10, STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4
		3.32000E+00 1400.00, 1400.00 IS LESS THAN PERHITTED  GAS EXIT TEMP (DEG K)= 525.00, GAS EXIT VEL. (M/SEC)= 17.10, STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC ) - SEASON 1 SEASON 2 SEASON 3 SEASON 4 2.58000E+00
WARNING - DISTANCE BETWEEN SOURCE	6 AND POINT X,Y=	1400.00, 1400.00 IS LESS THAN PERMITTED

#### - SOURCE INPUT DATA (CONT.) -

C T SOURCE SOURCE χ Υ EMISSION BASE / A A NUMBER TYPE COORDINATE COORDINATE HEIGHT ELEV- / - SOURCE DETAILS DEPENDING ON TYPE -(M) (M) (M) ATION / DΕ (M) / 7 STACK 1450.00 1450.00 10.00 0.0 GAS EXIT TEMP (DEG K)= 597.00, GAS EXIT VEL. (M/SEC)= 23.50, STACK DIAMETER (M)= 0.220, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIBTH OF ASSO. BLDG. (M)= 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( GRAMS PER SEC SEASON 1 SEASON 2 SEASON 3 SEASON 4 5.00000E-02

WARNING - DISTANCE BETWEEN SOURCE

7 AND POINT X,Y=

1400.00,

1400.00 IS LESS THAN PERMITTED

0.0

6.080246

4.859893

4.718844

4.834718

4.869595

4.821299

** Annual	** ANNUAL GROUND LEVEL CONCENTRATION ( MICROGRAMS PER CUBIC METER - GRID SYSTEM RECEPTORS - X AXIS (DISTANCE, METERS) -			CEPTORS -	) FROM AL	**			
	0.0		400.000	600.000	800,000	1000.000	1200.000	1400.000	1600.000
Y AXIS (DISTANCE	, MET( 	ERS ) 		- CONCEN	ITRATION -				
							,		
2800.000	3.220029	3.524536	3.605017	3.615244	3.522040	4.314055	6.064696	7.888139	7 <b>.</b> 56488
2600.000	3.234544	3.794643	4.184013	4.245025	4.167763	4.221553	6.441239	8,837399	8.40183
2400.000	3.178813	3 <b>.7</b> 96520	4.560292	5.065475	5.042226	4.745710	6.683132	9.913692	9.30971
2200.000	3.041562	3.692622	4.531508	5.612816	6.277427	5.943247	6.596407	11.139476	10.27265
2000.000	3.014135	3.459451	4.333310	5.524077	7.102837	7.994735	6.848034	13.045326	11.66870
1800.000	3 <b>.57</b> 0889	4.029323	4.565982	5.157894	6.905863	9.737239	10.880322	15.243754	13.36530
1600.000	4.112025	4.763934	5.602551	6.669120	8.173083	10.202686	14.010413	11.432037	22.17648
1400.000	4.530151	5.321721	6 <b>.</b> 376689	7.798002	9.995807	13.589966	17.977509	0.0	19.34083
1200.000	4.682827	5.477428	6.510115	7.842342	9.723125	11.955083	13.754611	14.855165	13.05357
1000.000	4.736092	5.495151	6.404479	7.277043	8.215838	9.275035	8.607262	13.676355	10.21690
900.000	4.618369	5.138420	5.716970	6.342004	6.932454	6.853301	6.696186	11.636185	9.63286
600.000	4.235336	4.641730	5.070085	5.501567	5.642071	5.491655	6.902942	10.430705	9.11475
400.000	3.858329	4.170755	4.484023	4.658336	4.707044	4.572384	6.872838	9.632897	3.64877
200.000	3.508533	3.737176	3.906032	4.010394	4.017709	4.579893	6.600005	8.739101	8.01048
0.0	3.170242	3.326421	3.434912	3 <b>.496847</b>	3.485236	4.602243	6.244042	7.934472	7.37963
				RID SYSTEM RE					
	1000 000	2000 000		XIS (DISTANCE		2000 000			
	1800.000	2000.000	2200.000	2400.000		2800.000			
Y AXIS (DISTANCE	, ME16	:RS ) 		- CUNCEN	TRATION -	· · · · · · · · · · · · · · · · · · ·			
2800.000	6.501601	5.479311	5.734924	5.906034	5.940056	5.874057			
	7.016782	6.372307							
2600.000			6.715748 7.959513	6.854389	6.819030	6.336232	-		
2400.000	7.503978	7.619370		8.008740	7.401616	6.819638			
2200.000	8.459656	9.254453	9.567934	8.753668	8.000930	7.302993			
2000.000	10.977933	11.557053	10.492844	9.531644	8,606297	7.786009			
1800.000	15.671804	13.242484	11.524594	10.369752	9.341122	3.469660			
1600.000	19.435349	15.210566		11.285411		9.114697			
1400.000	18.990036	15.077981	12.681806	11.410200	10.284693	9.264561			
1200.000	12.396023	10.265368	9.602204	9.317725	8.761593	8.128337			
1000.000	10.050705	9.515224	8.527699	7.887578	7.352287	7.023395			
900.000	7.624156	8.295063	8.147124	7.461082	6.361801	6.316178			
600.000	6.420841	6.984799	7.263528	7.009446	6.471212	5.982990			
400.000	6.526999	5.951578	6.220034	6.307941	6.060921	5.630553			
200.000	6.363023	5.154695	5.391961	5.502318	5.493229	5.281958			

\*\* ANNUAL GROUND LEVEL CONCENTRATION ( MICROGRAMS PER CUBIC METER ) FROM ALL SOURCES COMBINED (CONT.) \*\*

- PROGRAM DETERMINED MAXIMUM 10 VALUES -

CONCENTRATION COORDINATE COORDINATE

(METERS)	(METERS )	
1600.00	1600.00	22.176483
1800.00	1600.00	19.435349
1600.00	1400.00	19.340836
1800.00	1400.00	13.990036
1200.00	1400.00	17.977509
1800.00	1800.00	15.671804
1400.00	1800.00	15.243754
2000.00	1600.00	15.210566
2000.00	1400.00	15.077981
1400.00	1200.00	14.855165

#### STATE OF FLORIDA

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

March 16, 1983

#### CERTIFIED MAIL-RETURNED RECEIPT REQUESTED

Mr. Robert C. Gillander, Jr. Executive Vice President Regency Square Properties 9501 Arlington Expressway Jacksonville, Florida 32211

Dear Mr. Gillander:

In order to resume review of the application to modify the Regency Square Properties existing facility, submit the following, which was discussed today with Dr. John Koogler:

- the annual hours of operation and operation capacity of the two caterpiller engines used exclusively for air conditioning,
- 2) the power source for and the description of the heating system for the facility, and
- 3) the floor plan of the existing facility with dimensions (feet).

If you have any questions, please call Bruce Mitchell at (904) 488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.

Deputy Chief

Bureau of Air Quality

Management

CHF/BM/bjm

cc: Dr. John Koogler
Mary Smallwood
Doug Dutton
Jerry Woosley

RESTRICTED DELIVERY Show to whom and date delivered RESTRICTED DELIVERY. Show to whom, date, and address of delivery.\$	PS Form	ENDER:		us 1, 2, and 3. fress in the "RE	TURN TO space on
Show to whom, date and address of delivery	쌣. 1. 기	he follow	ving ser <b>vice i</b> s	requested (ch	eck one:)
RESTRICTED DELIVERY Show to whom and date delivered RESTRICTED DELIVERY. Show to whom, date, and address of delivery.\$	<del>-</del> }	🔯 Show	to whom and	l date delivere	d
Show to whom and date delivered	5		,		of delivery
CONSULT POSTMASTER FOR FEES)  2. ARTICLE ADDRESSED TO: Mr. Robert C. Gillander 9501 Arlington Expressway Jacksonville, FL 32211  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO. 0157992  (Always obtain signature of moderssee or agent) I have received the article described above. SIGNATURE CAddressee Clariford agent  DATE OF DELIVERY  DATE OF DELIVERY  5. ADDRESS (Complete only if resemble)	ö	REST	RICTED DEI	LIVERY	
CONSULT POSTMASTER FOR FEES)  2. ARTICLE ADDRESSED TO: Mr. Robert C. Gillander 9501 Arlington Expressway Jacksonville, FL 32211  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO. 0157992  (Always obtain signature of moderssee or agent)  I have received the article described above. SIGNATURE CAddressee Clariford agent  DATE OF DELIVERY  DATE OF DELIVERY  5. ADDRESS (Complete only if respectable)	9				d
(CONSULT POSTMASTER FOR FEES)  2. ARTICLE ADDRESSED TO: Mr. Robert C. Gillander  9501 Arlington Expressway Jacksonville, FL 32211  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO. 0157992  (Always obtain signature of addresses or agent)  I have received the article described above.  SIGNATURE CAddressee Clauderized agent  DATE OF DELIVERY  DATE OF DELIVERY  POSTMARK  S. ADDRESS (Complete only if respiration)  6. UNABLE TO DELIVER BECAUSE: CLEPKS	1.	☐ REST	RICTED DE	LIVERY.	
2. ARTICLE ADDRESSED TO:  Mr. Robert C. Gillander  9501 Arlington Expressway  Jacksonville, FL 32211  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO.  0157992  (Always obtain signature of addresses or agent)  I have received the article described above.  SIGNATURE CAddressee Clause:  DATE OF DELIVERY  DATE OF DELIVERY  POSTMARK  3. UNABLE TO DELIVER BECAUSE:  CLEPKS		Show	to whom, da	te, and addres	s of delivery.\$
Mr. Robert C. Gillander  9501 Arlington Expressway  Jacksonville, FL 32211  3. ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO.  0157992  (Always chain signature of addresses or agent)  I have received the article described above. SIGNATURE CAddressee Clastication agent  DATE OF DELIVERY  DATE OF DELIVERY  FOSTMARK  5. ADDRESS (Complete only if receivage)		(CON	SUL <b>T PO</b> STA	ASTER FOR	r FEES)
Jacksonville, FL 32211  ARTICLE DESCRIPTION: REGISTERED NO. CERTIFIED NO. INSURED NO. 0157992  (Always chain signature of addresses or agent)  I have received the article described above.  BIGNATURE CAddresses Clauthorized agent  DATE OF DELIVERY  DATE OF DELIVERY  S. ADDRESS (Complete only if respectable)		ARTICLE	ADDRESSED	TO:	*:
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PS Form 3800, Apr.

3/16/83

#### STATE OF FLORIDA

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301



BOB GRAHAM GOVERNOR

VICTORIA J. TSCHINKEL SECRETARY

### RECEIVED

MAR 3 1983

NORTHEAST DISTRICT ER GAINESVILLE BRANCHDAR 07 1983

WAIVER OF 90 DAY TIME LIMIT

UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

Applicant's Name: Regency Square Properties, Inc.

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 15th day of May 1983.

The undersigned is authorized to make this waiver on behalf of the applicant.

Signature

Robert C. Gillander, Exec. Vice President

Please Type Name of Signee

2 March 1983

Date

Sworn to and subscribed before me this and day

198

otary Rublic? Stategof Florida at Large My commission appres July 15, 1985

Ŕ~Fő°£`````````````````` 201(8)

Effective November 30, 1982

Page 1 of 2

#### Regency Square Properties, Inc.

Post Office Box 2718 Jacksonville, Florida 32232-0033

Telephone 904-725-9272

December 22, 1982

DER

MAR 1 1983

BAQM

Dr. John B. Koogler Sholtes & Koogler Environmental Consultants 1213 N. W. 6th Street Gainesville, Florida 32601

Dear John:

In response to your December 16, 1982 letter, please find below the answers to the nine questions that will provide the FDER with complete information regarding the permitting of our Total Energy plant.

#### 1. The brake horsepower of each engine:

#### Worthington's

#1	-	1900			#4	_	2452
#2	-	1900			#5	-	3875
#3	_	1900		٠	#6	_	2700

Caterpillars - All rated at 775

#### 2. The rated capacity of the generators:

#### Worthington's

#1 -	1250			#4	-	1750
#2 -	1250			#5	-	2750
#3 -	1350	•		#6	_	2137

Caterpillars - All are rated at 500

#### 3. The heat input needed to generate one KW:

#### Worthington's

#### Assuming duel fuel

#1	-	12,000		•	#4	-	11,500
#2	_	12,000			#5	_	10,500
#3	-	11,800	_		#6	-	11,200

Caterpillars - All are rated at 13,520

4. Maximum capacity for each engine generator to be permitted:

BAQM

I agree with your suggestion that each should be permitted for the maximum electric output for which it is rated. The specifics given in number two above provide the ratings.

5. The hours of operation to be permitted:

I agree with your suggestion and would recommend that we try for the full 8,760 hours per year, and make the FDER reduce that if necessary under the permit.

6. The maximum diesel fuel input at 100% diesel fuel:

#### Worthington's

#1 - 80 gallons	per hour	#4 -	120	gallons	per	hour
#2 - 80 gallons	per hour			gallons		
#3 - 80 gallons	per hour	#6 -	140	gallons	per	hour

7. Maximum natural gas diesel fuel input when operating in a duel fuel mode:

For the Worthington's, the specifics for number three above provide the amounts with reference to natural gas and the related diesel fuel input would be 5-7 gallons per hour per each unit. The caterpillar engines do not operate under diesel oil.

- 8. We do not anticipate operating the Worthington's engines on 100% diesel fuel, but we would like to have this flexibility in the permitting.
- 9. The fuel consumption information provided you earlier was obtained during the duel fuel operation.

If you have any questions regarding the above information, please contact me.

Sincerely,

Robert C. Gillander, Jr. Executive Vice President

RCG/b1m

#### STATE OF FLORIDA

#### DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM GOVERNOR VICTORIA J. TSCHINKEL SECRETARY

February 23, 1983

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Robert C. Gillander, Jr. Executive Vice President Regency Square Properties 9501 Arlington Expressway Jacksonville, Florida 32211

Dear Mr. Gillander:

RE: Construction of Worthington Generator Set No. 5

An inquiry was made by your consultant, Dr. John Koogler, on February 22, 1983, to see if you could operate the referenced generator set prior to receiving the construction permit, AC 16-60981, or under the previously issued construction permit, AC 16-40548.

Chapter 17-4.03, Florida Administrative Code (FAC), prohibits the construction of any stationary installation which will reasonably be expected to be a source of pollution without a valid permit. Also, Chapter 17-2.210, FAC, requires that the owner or operator of any source which emits or can reasonably be expected to emit any air pollutant shall obtain a permit from the Department prior to beginning construction of the source unless exempted pursuant to Department rule or statute. Therefore, to be on record, any construction of the referenced generator set would be a direct violation of the applicable rules.

If there are any questions, please call Bruce Mitchell at (904)488-1344 or write to me at the above address.

Sincerely

C. M. Fahcy, P.E. Deputy Chief

Bureau of Air Quality
Management

CHF/pa

cc: Doug Dutton
Jerry Woosley
Mary Smallwood
John Koogler

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

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#### STATE OF FLORIDA

#### **DEPARTMENT OF ENVIRONMENTAL REGULATION**

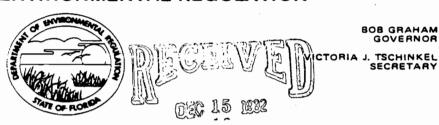
TWIN TOWERS OFFICE BUILDING 2600 BLAIR STONE ROAD TALLAHASSEE, FLORIDA 32301

DER

DEC 1 6 1982

BAQM

Effective November 30, 1982



DIV. ENVIRONMENTAL PERMITTING

#### WAIVER OF 90 DAY TIME LIMIT UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No.  $\underline{AC16-60981}$ 

Applicant's Name: Regency Square Properties, Inc.

The undersigned has read Sections 120.60 understands the applicant's rights under	0(2) and 403.0876, Florida Statutes, and fully that section.
applicant hereby with full knowledge ar under Sections 120.60(2) and 403.0876, I tions 120.60(2) and 403.0876, Florida S denied by the State of Florida Department time period prescribed in Sections 120. waiver is made freely and voluntarily by	ense (permit, certification) application, the od understanding of (his) (her) (its) rights florida Statutes, waives the right under Sectatutes, to have the application approved or to find the applicant, is in (his) (her) (its) self-coercion by anyone employed by the State of lation.
This waiver shall expire on the $15 \mathrm{th}$ da	<del></del>
	MUDDI
	Signature  Robert C. Gillander, Jr.
Sworn to and subscribed before me, this State day	Please Type Name of Signee
Notary Public, State of Florida et Large	Date
DER Form 17-1.201(8)	

Page 1 of 2

#### Section 120.60, Florida Statutes

When an application for a license is made as required by law, the agency shall conduct the proceedings required with reasonable dispatch and with due regard to the rights and privileges of all affected parties or aggrieved persons. Within 30 days after receipt of an application for a license, the agency shall examine the application, notify the applicant of any apparent errors or omissions, and request any additional information the agency is permitted by law to require. Failure to correct an error or omission or to supply additional information shall not be grounds for denial of the license unless the agency timely notified the applicant within this 30 day The agency shall notify the applicant if the activity for which he seeks a license is exempt from the licensing requirement and return any tendered application fee within 30 days after receipt of the original application or within 10 days after receipt of the timely requested additional information or correction of errors or omissions. Every application for license shall be approved or denied within 90 days after receipt of the original application or receipt of the timely requested additional information or correction of errors or omissions unless a shorter period of time for agency action is provided by law. The 90-day or shorter time period shall be tolled by the initiation of a proceeding under Section 120.57 and shall resume 10 days after the recommended order is submitted to the agency and the parties. Any application for a license not approved or denied within the 90-day period or shorter time period, within 15 days after conclusion of a public hearing held on the application, or within 45 days after the recommended order is submitted to the agency and the parties, whichever is latest, shall be deemed approved and, subject to the satisfactory completion of an examination, if required as prerequisite to licensure, the license shall be issued. The Public Service Commission, when issuing a license, and any other agency, if specifically exempted by law, shall be exempt from the time limitations within this subsection. Each agency, upon issuing or denying a license, shall state with particularity the grounds or basis for the issuance or denial of same, except where issuance is a ministerial act. On denial of a license application on which there has been no hearing, the denying agency shall inform the applicant of any right to a hearing pursuant to Section 120.57.

Section 403.0876, Florida Statutes

Permits; processing. ---Within 30 days after receipt of an application for a permit under this chapter, the department shall review the application and shall request submittal of all additional information the department is permitted by law to require. If the applicant believes any departmental request for additional information is not authorized by law or departmental rule, the applicant may request a hearing pursuant to s. 120.57. Within 30 days after receipt of such additional information, the department shall review it and may request only that information needed to clarify such additional information or to answer new questiona raised by or directly related to such additional information. If the applicant believes the request of the department for such additional information is not authorized by law or departmental rule, the department, at the aplicant's request, shall proceed to process the permit application. Permits shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant's written request to begin processing the permit application.

### DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES

Bio-Environmental Services Division Air and Water Pollution Control

November 1, 1982



Mr. Edward Palagyi BACT Coordinator Bureau of Air Quality Management Dept. of Environmental Regulation 2600 Blairstone Road Tallahassee, Florida 32301-8241

DER

Dear Mr. Palagyi:

NOV 05 1982

Bio-Environmental Services Division provides the following comments on the draft BACT determination for Regency Square Properties #5 Worthington generator:

- (1) It is noted that the unit is a dual fueled fired unit (i.e.: natural gas and diesel oil simultaneously). It is also capable of operating on 100% diesel oil only.
- (2) It is recommended that a visible emission limit also be established as BACT. A suggested level would be 5% above the average opacity taken during a NO<sub>X</sub> stack test to determine compliance, but in no case higher than 20% opacity.
- (3) What justification did the review group use in determining that the #6 unit was newer in design than the #5 unit? It is my understanding that when purchased by Regency Square Properties, both units were used units.
- (4) On page 2/4 Emission Factors ( $NO_X$ ) of the PSD application, an emission factor of .0166 lbs  $NO_X$ /KWH is used in determining potential emissions from the #5 unit. It is noted that the .0166 lbs  $NO_X$ /KWH was obtained from the test on the #6 unit operating at 76% of design capacity. It is my understanding that  $NO_X$  emissions dramatically increase at operating loads above 85% design capacity. Your attention to this in establishing test requirements is requested.

If I may be of further assistance, please advise.

Very truly yours,

Jerry E. Woosley Assistant Engineer

JEW/vj

cc: Mr. Bob Gillander

cc: Dr. Robert Sholtes, P.E.



#### **BEST AVAILABLE COPY**

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SUITE 1200 BARNETT REGENCY TOWER POST OFFICE BOX 2718 JACKSONVILLE, FLORIDA 32232-0033

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Florida Department of Environmental Regulation



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#### RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

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SKEC 258-81-01

September 27, 1982

DER
OCT 01 1982
BAOM

Mr. Clair Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Subject: Regency Square Properties

Duval County Total Energy Plant

Dear Mr. Fancy:

Regency Square Properties owns a shopping center and an adjoining office complex in Jacksonville, Florida. Associated with this complex is a Total Energy Plant, the purpose of which is to generate all of the energy requirements for the shopping center and the office complex.

Regency Square Properties is proposing to increase the electric power generating capacity of the total energy plant by installing a 2,750 kilowatt generating set. The generator is driven by a 3,800 hp Worthington engine which can be fired either with natural gas or deisel fuel. It has been the experience of Regency Square Properties that natural gas will be used as fuel in excess of 90 percent of the time.

Attached hereto are Florida Department of Environmental Regulation Construction Permit Applications for the proposed electric power generator and applications for state and federal PSD review. Regency Square is submitting these applications to satisfy both state and federal requirements for new source permitting.

If there are any questions regarding these applications, please feel free to contact me.

Very truly yours,

SHOLTES & KOOGLER

ENVIRONMENTAL CONSULTANTS, INC.

John B. Koogler, Ph.D., P.E

JBK:sc

Enclosures

cc: Mr. Robert C. Gillander, Jr. (w/enc.)

Dispersion Modeling, Air Quality Monitoring, Emission Measurements, Meteorological Studies, Control Systems Design, Control System Evaluation, Environmental Impact Studies, Noise Surveys, Radiological Studies, Instrumentation for Control Systems, Instrumentation for Environmental Monitoring

### AC 16-60981

#### **BEST AVAILABLE COPY**



DER

OCT 1 1982

## BAQM

.9/27/82

### STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

### APPLICATION TO ØREHYATE/CONSTRUCT AIR POLLUTION SOURCES

·		•			-
SOURCE TYPE: Electric	Power Generator	. KX New <sup>1</sup>	[ ] Existing <sup>1</sup>		
APPLICATION TYPE: [闪 Co	onstruction [ ] Operation [ ]	Modification			·
COMPANY NAME: Regency	Square Properties		·	COUNTY:Dt	ıval
Identify the specific emission po No. 2, Gas Fired)	oint source(s) addressed in this all ton Generating Set No.	oplication (i.e. 5; 3,800	Lime Kiln No. HP engine/	4 with Venturi 972,750 kw ge	Scrubber; Peeking Unit
SOURCE LOCATION: Street	9501 Arlington Exp			City Jackson	
UTM:	East447.170 km			3354.610 k	
Latitu	ide 30 0 19 · 26 "	N		8/032	
APPLICANT NAME AND TITLE	Martin E. Ste	in, Partne			
	te 1200, Barnett Regen	cy Tower,	Jacksonvil	le, FL 322	
AIT EIGANT ADDITESS.				-	
	SECTION I: STATEMENTS B	Y APPLICAN	T AND ENGIN	EER	
A. APPLICANT	•				
	r or authorized representative* of	Regency	Square Pro	perties	· ·
•	s made in this application for a _	Conctnuc			
permit are true, correct ar	nd complete to the best of my l	knowledge and	d belief. Furthe	er, I agree to ma	intain and operate the
pollution control source a	ind pollution control facilities in	such a manr	er as to comp	ly with the pro	vision of Chapter 403,
granted by the department	he rules and regulations of the do t, will be non-transferable and I w	epartment and vill promptly n	i revisions theri iotifv7tb∉ depar	eor, i also under traient upon sale	or Jegal transfer of the
permitted establishment.	, 20	۲۰۰۱،۱۳۱۱ م	1///1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/		
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	•		Name an	d Title (Please T	
•		Date:9/	<u>/29/82</u>	Telephone No.	904)725-9272
B. PROFESSIONAL ENGINE	ER REGISTERED IN FLORIDA	(where requir	ed by Chapter	471, F.S.)	
		·	•		
be in conformity with mod	ngineering features of this pollution dern engineering principles applic	on control prop able to the tre	ect nave been a eatment and dis	sesigneer/examini sposal of pollutar	ed by me and round to
permit application. There is	s reasonable assurance, in my pro	ofessional judg	ment, that the	pollution contro	ol facilities, when prop-
	ed, will discharge an effluent that e department. It is also agreed tha				
cant a set of instructions for	r the proper maintenance and ope	eration of the	pollution contr	of facilities and,	if applicable, pollution
sources. KO		٠.		$\mathcal{A}$	
SURTIFICA		Signed:	<del></del>	2/cc	
		John B.	. Koog1e/r,	P.E. //	
NO. 12925		CUOL TEG	Nan	ne (Please Type)	NTAL CONSULTANTS,
STATE OF		30011	*		
CORION (S)		1010 NI		Name (Please T	
CHED ENGLISH	•	1213 NV		Gainesville Address (Please T	<u>'</u>
Florido Bosinession M	12925	9/27	7/82	(9	904)377-582
Florida Registration No		Date:		Telephone No.`_	

<sup>&</sup>lt;sup>1</sup>See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.) DER FORM 17-1.122(16) Page 1 of 10

#### SECTION II: GENERAL PROJECT INFORMATION

A 2,750 kw generator deiven by a 3,800 hp natural gas/diese	1 fired Worthington
reciprocating engine is being installed at the existing Reg	
Plant. Natural gas is the primary fuel and will be used (ba	
more than 90 percent of the time	
Schedule of project covered in this application (Construction Permit Application Only)	
Start of Construction December, 1982 Completion of Construction	January, 1983
Costs of pollution control system(s): (Note: Show breakdown of estimated costs only f project serving pollution control purposes. Information on actual costs shall be furnish permit.)	or individual components/units of the
Not Applicable; there is no add-on pollution control equipm	ent.
Indicate any previous DER permits, orders and notices associated with the emission point tion dates.	
Proposed unit was previously permitted under A016-2575, exp	
de-permitted when permits AC16-40548 & AD16-45674, expiring	
permits cover the 5 existing Worthington & the 9 existing C	aterpillar generators at
and Chapter 22F-2, Florida Administrative Code? YesX No	
and Chapter 22F-2, Florida Administrative Code? Yes^_ No  Normal equipment operating time: hrs/day24; days/wk7; wks/yr52  if seasonal, describe:	•
Normal equipment operating time: hrs/day $\frac{24}{}$ ; days/wk $\frac{7}{}$ ; wks/yr $\frac{52}{}$	; if power plant, hrs/yr
Normal equipment operating time: hrs/day $\frac{24}{}$ ; days/wk $\frac{7}{}$ ; wks/yr $\frac{52}{}$	; if power plant, hrs/yr
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:	; if power plant, hrs/yr
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:	; if power plant, hrs/yr
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:	; if power plant, hrs/yr
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:  If this is a new source of major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?	; if power plant, hrs/yr
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:    This is a new source of major modification, answer the following questions. (Yes or No)	; if power plant, hrs/yr YES
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52  if seasonal, describe:  If this is a new source or major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?  a. If yes, has "offset" been applied?	; if power plant, hrs/yr  YES N/A
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:  If this is a new source or major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?  a. If yes, has "offset" been applied?  b. If yes, has "Lowest Achievable Emission Rate" been applied?  c. If yes, list non-attainment pollutants.	; if power plant, hrs/yr YES N/A
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52 if seasonal, describe:  If this is a new source of major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?  a. If yes, has "offset" been applied?  b. If yes, has "Lowest Achievable Emission Rate" been applied?  c. If yes, list non-attainment pollutants.  Ozone  2. Does best available control technology (BACT) apply to this source? If yes, see	YES N/A N/A
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52  if seasonal, describe:  If this is a new source of major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?  a. If yes, has "offset" been applied?  b. If yes, has "Lowest Achievable Emission Rate" been applied?  c. If yes, list non-attainment pollutants.  0zone  2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.  3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements	YES N/A N/A  YES
Normal equipment operating time: hrs/day 24; days/wk 7; wks/yr 52  if seasonal, describe:  If this is a new source of major modification, answer the following questions. (Yes or No)  1. Is this source in a non-attainment area for a particular pollutant?  a. If yes, has "offset" been applied?  b. If yes, has "Lowest Achievable Emission Rate" been applied?  c. If yes, list non-attainment pollutants.  Ozone  2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.  3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII.  4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to	YES N/A N/A  YES YES

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

#### SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

ſ		Contaminants		Utilization	Datas as Str. Bi		
	Description	Туре	% Wt	Rate - lbs/hr	Relate to Flow Diagram		
	NOT APPLICABLE						
ſ					· .		
ſ				·			

B.	Process Rate.	if applicable:	(See Section )	V. Item 1)

1. Total Process Input Rate (lbs/hr): \_\_\_\_NOT\_APPLICABLE

2. Product Weight (lbs/hr): \_\_\_\_\_

NOT APPLICABLE

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission <sup>1</sup>		Allowed Emission <sup>2</sup>	- Allowable <sup>3</sup>	Potential Emission <sup>4</sup>		Relate
	Maximum (bs/hr	Actual T/yr	Rate per Ch. 17-2, F.A.C.	Emission lbs/hr	lbs/hr	T/yr	to Flow Diagram
See Page 3A							
	-						

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Name and Type (Model & Serial No.) Contaminant		Range of Particles <sup>5</sup> Size Collected (in microns)	Basis for Efficiency (Sec. V, It <sup>5</sup>	
NO ADD-ON CONTROL EQ	JIPMENT		-		
		٠.	. 8		

<sup>&</sup>lt;sup>1</sup>See Section V, Item 2.

<sup>&</sup>lt;sup>2</sup>Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

<sup>&</sup>lt;sup>3</sup>Calculated from operating rate and applicable standard

<sup>&</sup>lt;sup>4</sup>Emission, if source operated without control (See Section V, Item 3)

<sup>&</sup>lt;sup>5</sup>If Applicable

	<del></del>		Emissions	· · · · · · · · · · · · · · · · · · ·	<u></u>	Allowable and
Contaminant_	Ga (1b/hr)	s (tpy)	Dies (lb/hr)	el (tpy <b>(</b> 1)	Emission Standard	Potential Emissions (lb/hr) (tpy)
Particulate Matter	<0.1	<0.1	6.9	22.7	N/A	Same as Actual Emissions
Sulfur Dioxide	<b>&lt;</b> 0.1	0.1	6.4	21.0	N/A	n
Nitrogen Oxides	45.6	199.9	25.2	82.8	17-2.630 FAC	u .
Hydrocarbons (non-methane)	3.5	15.3	1.4	4.5	N/A	n
Carbon Monoxide	11.8	51.7	21.0	69.0	N/A	n .

<sup>(1)</sup> Based on maximum operating time on diesel fuel of 6,570 hours per year.

#### E. Fuels

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Type (Be Specific)	Consu	Consumption*			
Type (be specific)	avg/hr	max./hr /	(MMBTU/hr)		
Natural Gas	0.0233	0.0274	28.60		
Diesel	4.20	4.90	28.60		
		-			

•0	nits Natural Gas	, MMCF/hr; Fue	el Oils, barrels/hr	; Coal, lbs/hr				•
Fue	el Analysis:	Gas	/Diesel	,				
Per	cent Sulfur:	Ni1/0.2			Percent Ash: _	/Nil	•	· · · · · · · · · · · · · · · · · · ·
Der	nsity:		/7.0 15 BTU/ft <sup>3</sup> /19860		Typical Percen	t Nitrogen:	·/Trace	•
Hea	it Capacity:	045 BTU/ft	<sup>3</sup> /19860	BTU/Ib		/13	39,000	BTU/gal
Oth	er Fuel Contam	inants (which m	ay cause air poll	ution):	lone			
F.	If applicable,	indicate the per	cent of fuel used	d for space heati	ng. Annual Av	erage <u>N/A</u>	Maximum	
G.	Indicate liqui	d or solid waste:	s generated and n	nethod of dispo				
	None							
	·			•	•			
Н.	Emission Stac	k Geometry and	flow Character					
• ••	_			•	Stack Diameter		.0	ft.
	Gas Flow Rat	13,	230	ACEM	Gas Evit Temp	89		of.
			8					FPS
	water vapor t	Jointeint.	_		velocity.			113
	•	\			•			
		•	PECTION	IIV. INCINED	ATOR INFORM	ATION		
			3501101		LICABLE	ATION		
					T	_	Type V	Type VI
Ty	pe of Waste	Type O (Plastics)	Type 1 (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	(Liq & Gas By-prod.)	(Solid By-prod.)
Lbs	·/hr							
Inc	inerated							
)esc	ription of Waste	)	-		- -		<u>.                                    </u>	
						/ (lbs/hr)		
						days/w		
			peration per day					
ale	Constructed		<del></del>	<u> </u>	MODEL NO			

	Volume	Heat Release	ı	Fuel -	Temperature
-	(ft)3	(BTU/hr)	Туре	BTU/hr	(OF)
Primary Chamber					
Secondary Chamber					
Stack Height:		ft. Stack Diameter		Stack Temp.	
		•		·	FPS
*If 50 or more tons per cess air.	day design capac	ity, submit the emission	ns rate in grains p	per standard cubic foot d	ry gas corrected to 50% ex
Type of pollution control	device: [ ] Cy	rclone [ ] Wet Scrubb	er [] Afterbu	rner [ ] Other (specif	y)
Brief description of opera	ting characteristi	cs of control devices:	·	<u> </u>	
	<u> </u>				
	, <del>-</del>	_		•	
Hatman A. Paranal affirm	SSI inhanah				
Jitimate disposal of any e	muent other tha	n that emitted from the	stack (scrubber )	water, ash, etc.):	
			<del></del> -		
					у
	<b>V</b>				

Please provide the following supplements where required for this application.

- 1. Total process input rate and product weight show derivation. NOT APPLICABLE
- 2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

  See Attached PSD Application Appendix A-2
- 3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test). See Attached PSD Application Appendix A-2
- 4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
- 5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency). NOT APPLICABLE
- 6. An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. NOT APPLICABLE
- 7. An 8½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, In relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map). ATTACHMENT 1
- 8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. ATTACHMENT 2

- 9. An application fee of \$20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.
- 10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

Contaminant	Rate or Concentration
	<del></del>
as EPA declared the best available control to	echnology for this class of sources (If yes, attach copy) [ ] Yes [ $^{X}$ ] No
Contaminant	Rate or Concentration
<del>`</del>	
	<del></del> -
<del></del>	
hat emission levels do you propose as best a	vailable control technology?
<b>Contaminant</b> NOx	Rate or Concentration $1.60 \text{ lb/}10^6 \text{BTU}$ when gas fired
NOX .	$\frac{1.88 \text{ lb/}10^6 \text{ BTU when diesel fired.}}{0.88 \text{ lb/}10^6 \text{ BTU when diesel fired.}}$
	<u> </u>
scribe the existing control and treatment te	chnology (if any). NONE
. Control Device/System:	
Control Device/System: Operating Principles:	
	4. Capital Costs:
. Operating Principles:	<ul><li>4. Capital Costs:</li><li>6. Operating Costs:</li></ul>
. Operating Principles: . Efficiency: *	
. Operating Principles: . Efficiency: * . Useful Life:	6. Operating Costs:
. Operating Principles: . Efficiency:   . Useful Life: . Energy:	6. Operating Costs:

<sup>\*</sup>Explain method of determining D 3 above.

	10. 3	tack rarameters	•			·	
	a.	Height:	ft.	b.	Diameter:		
	c.	Flow Rate:	ACFM	d.	Temperature:		
	e.	Velocity:	FPS				
E.	Descri	be the control and treatment tec	hnology available (As i	many	y types as applicable, use	additional pages	if necessary
	1.						
	a.	Control Device:					
	<b>b.</b>	Operating Principles:					
		· · · ;					
	C.	Efficiency*:		d.	Capital Cost:		
	∙ €.	Useful Life:		f.	Operating Cost:		
	g.	Energy*:		h.	Maintenance Cost:		
	i.	Availability of construction m	aterials and process ch	emic	als:		
	j.	Applicability to manufacturing	g processes:				
	k.	Ability to construct with cont	trol device, install in av	ailab	le space, and operate wit	hin proposed leve	els:
	2.		•	•			
	a.	Control Device:			,		
	b.	Operating Principles:					
	c.	Efficiency*:		đ.	Capital Cost:		
	e.	Useful Life:		<b>f.</b>	Operating Cost:		•
	g.	Energy **:		h.	Maintenance Costs:		
	i.	Availability of construction ma	aterials and process che	emic	als:		
	j.	Applicability to manufacturing					
	y. k.	Ability to construct with contr		ilah	le space, and operate wit	hin proposed lev	ale:
		·	or device, mistair in ave		e space, and operate with	iiii proposed ievi	G13.
*Fv:	olain me	thod of determining efficiency.					
		be reported in units of electrical	nower - KWH design	rata			
	3.	c reported in drints or electrical	power - Kwii design	, a.c.			
		Control Device:					
	8. L		·				
	b.	Operating Principles:	: .				
		Essisiana.			Comitant Courts		
	<b>C</b> .	Efficiency*:		d.	Capital Cost:		
	e.	Life:		f.	Operating Cost:		
	g.	Energy:		h.	Maintenance Cost:		

<sup>\*</sup>Explain method of determining efficiency above.

			· · · · ·	
j. Ar	plicability to manufacturing processes:			
k. At	ility to construct with control device, install	in availal	ple space and operate within p	roposed levels:
4.				
a. Co	ntrol Device			
b. Op	erating Principles:			· .
c. Eff	iciency*:	d.	Capital Cost:	
e. Lif	<b>e:</b>	f.	Operating Cost:	•
g. En	ergy:	· h.	Maintenance Cost:	
i. Av	ailability of construction materials and proces	s chemic	als:	
iΔn	nlicability to manufacturing processes:		•	
	•	n availah	le space, and operate within r	aronosed levels:
		., ., .,	ic space, and operate within p	Toposco levels.
	,		•	•
		3	Capital Cort	•
	•	. /.	Maintenance Cost:	
			•	
9. Other lo	cations where employed on similar processes:	:		
a.				
(1)				
(2)	Mailing Address:			
(3)	City:	(4)	State:	•
. (5)	Environmental Manager:			
(6)	Telephone No.:			
lain method	of determining efficiency above.			
(7)	Emissions*:			
	Contaminant		Rate or Co	ncentration
			· · · · · · · · · · · · · · · · · · ·	<u> </u>
(8)	Process Rate*:			
<b>b.</b> -	•			
(1)	Company:			
(2)	Mailing Address:			•
(3)	City:	(4)	State:	
	k. Ab  4.  a. Co b. Op  c. Eff e. Lif g. End i. Av  j. Ap k. Ab  Describe the 1. Control 2. Efficien 4. Life: 6. Energy: 8. Manufac 9. Other lo a.  (1)  (2)  (3)  (5)  (6)  lain method  (7)  (8)  b.  (1)  (2)	k. Ability to construct with control device, install 4.  a. Control Device b. Operating Principles:  c. Efficiency*: e. Life: g. Energy: i. Availability of construction materials and process. k. Ability to construct with control device, install in Describe the control technology selected: 1. Control Device: 2. Efficiency*: 4. Life: 6. Energy: 8. Manufacturer: 9. Other locations where employed on similar processes a.  (1) Company: (2) Mailing Address: (3) City: (5) Environmental Manager: (6) Telephone No.: lain method of determining efficiency above. (7) Emissions*:  Contaminant  (8) Process Rate*: b. (1) Company: (2) Mailing Address:	k. Ability to construct with control device, install in available.  a. Control Device b. Operating Principles:  c. Efficiency*: d. e. Life: f. g. Energy: h. i. Availability of construction materials and process chemic j. Applicability to manufacturing processes: k. Ability to construct with control device, install in availab Describe the control technology selected: 1. Control Device: 2. Efficiency*: 3. 4. Life: 6. Energy: 7. 8. Manufacturer: 9. Other locations where employed on similar processes: a.  (1) Company: (2) Mailing Address: (3) City: (4) (5) Environmental Manager: (6) Telephone No.: lain method of determining efficiency above. (7) Emissions*: Contaminant  (8) Process Rate*: b. (1) Company: (2) Mailing Address:	k. Ability to construct with control device, install in available space and operate within p 4.  a. Control Device b. Operating Principles:  c. Efficiency*: d. Capital Cost: f. Operating Cost: h. Maintenance Cost: i. Availability of construction materials and process chemicals: j. Applicability to manufacturing processes: k. Ability to construct with control device, install in available space, and operate within p Describe the control technology selected: 1. Control Device: 2. Efficiency*: 3. Capital Cost: 4. Life: 5. Operating Cost: 6. Energy: 7. Maintenance Cost: 8. Manufacturer: 9. Other locations where employed on similar processes: a. (1) Company: (2) Mailing Address: (3) City: (4) State: (5) Environmental Manager: (6) Telephone No.: lain method of determining efficiency above. (7) Emissions*: Contaminant Rate or Co  (8) Process Rate*: b. (1) Company: (2) Mailing Address:

Availability of construction materials and process chemicals:

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(6) Telephon	(6) Telephone No.:				
(7) Emissions*:					
(	Contaminant	•	Rate or Con	centration	
			•		
	•		<del></del>		

(8) Process Rate\*:

(5)

10. Reason for selection and description of systems:

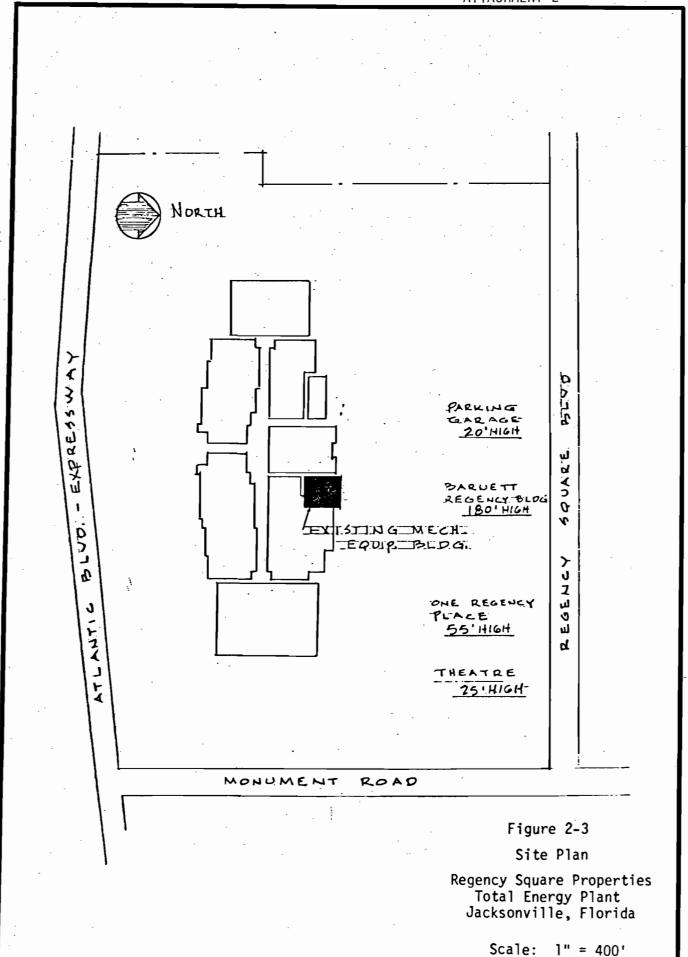
Environmental Manager:

<sup>\*</sup>Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

#### SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

	NOX XDSP	(_) so <sup>2</sup> *	. Wind spd/dir
Period of monitoring	6 / /80	to 12 / 31 / 81	_(Site 1960-032-H02)
<b>8876</b> 88888888888	month day year 9 80	month day year to 12 31 81	(Site 1960-070-H01)
	al summaries to this applicati	on. Data on File wit	
2. Instrumentation, Field and	·	•	
		alent? X Yes N	0
4		h Department procedures?	
Meteorological Data Used for			
•		to 12 / 31 / 74 month day year	_
	· · ·	• • • • • • • • • • • • • • • • • • • •	
2. Surface data obtained from	n (location) <u>Jacksonvil</u>	<u>le</u>	
3. Upper air (mixing height) o	data obtained from (location	<u>Jacksonville</u>	<u> </u>
4. Stability wind rose (STAR	) data obtained from (locatio	n) <u>Jacksonville</u>	·
Computer Models Used  1. ISC-LT, unmodifie	ed		Modified? If yes, attach description.
2		•	Modified? If yes, attach description.
3			Modified? If yes, attach description.
4			Modified? If yes, attach description.
Attach copies of all final mod	lel runs showing input data re	ecentor locations, and princip	de outnut tables
Attach copies of all final mod	•	eceptor locations, and princip	ile output tables.
Applicants Maximum Allowab	ble Emission Data		
Applicants Maximum Allowat	ble Emission Data	Emission R	date
Applicants Maximum Allowate Pollu	ble Emission Data utant SHX NOx		
Applicants Maximum Allowate Pollu	ble Emission Data	Emission R	date
Applicants Maximum Allowate Pollu	ble Emission Data utant SHX NOX	Emission R	ate grams/sec
Applicants Maximum Allowate Pollu	ble Emission Data  utant  SHX NOX  D2  ing  es. Emission data required is	Emission R 5.75  source name, description on	ate grams/sec
Applicants Maximum Allowab Pollu  K  SC  Emission Data Used in Modelii Attach list of emission source	ble Emission Data utant SPX NOX D2 ing es. Emission data required is allowable emissions, and nor	Emission R 5.75 source name, description on mal operating time.	ate grams/sec grams/sec
Applicants Maximum Allowab Pollu SC Emission Data Used in Modelii Attach list of emission source UTM coordinates, stack data, stack data, stack all other information se	oble Emission Data  utant  SPX NOX  2  ing  es. Emission data required is allowable emissions, and norms  supportive to the PSD review.	Emission R 5.75 source name, description on mal operating time.	ate grams/sec grams/sec
Applicants Maximum Allowab Pollu  SC Emission Data Used in Modelic Attach list of emission source UTM coordinates, stack data, a Attach all other information secify bubbler (B) or continuous	ble Emission Data  utant  SPX NOX  D2  ing  es. Emission data required is allowable emissions, and nor supportive to the PSD review.  (C).  nic impact of the selected te	Emission R 5.75  source name, description on mal operating time.	grams/sec grams/sec grams/sec point source (on NEDS point number),

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



DER OCT 1 1982 BAQM

APPLICATION FOR FEDERAL PSD APPROVAL

REGENCY SQUARE PROPERTIES JACKSONVILLE, FLORIDA

SEPTEMBER 24, 1982

SHOLTES & KOOGLER
ENVIRONMENTAL CONSULTANTS, INC.
1213 NW 6TH STREET
GAINESVILLE, FLORIDA 32601
(904) 377-5822

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	4.1 Existing Air Quality Data 4.2 Meteorological Data 4.3 Emission Data 4.4 Air Quality Modeling 4.5 Summary	4-1 4-2 4-2 4-3 4-5
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#### 1.0 INTRODUCTION

Regency Square Properties owns a shopping center and office complex located at 9501 Arlington Expressway in Jacksonville, Florida. Associated with this complex is a Total Energy Plant (TEP) which was designed to generate the total energy requirements of the shopping center and office complex. The present electric power generating capacity of the TEP is 11,400 kilowatts. In addition to this capacity, there are two natural gas fired engines, each rated at 750 horsepower, which drive air conditioning compressors.

The electric power generating capacity in the TEP presently consists of five Worthington natural gas/diesel fired reciprocating engines driving Worthington generators and seven natural gas fired Caterpillar reciprocating engines driving electric power generators.

Regency Square Properties is proposing to install a sixth natural gas/diesel fired Worthington reciprocating engine driving a Worthington electric power generator. The capacity of the proposed unit is 2,750 kilowatts. The unit will be fired with natural gas as the primary fuel and diesel fuel as a stand-by fuel. The purpose for installing the proposed electric power generator unit is to provide a more reliable power generating system for the Regency Square Shopping Center which was expanded in 1979/1980 under the conditions of complex source permit AC16-23105.

The installation of the proposed electric power generating unit will not increase employment at the Regency Square Property TEP, nor will it result in additional traffic in or around the Regency Square Shopping Center and Office Complex. In view of this, there will be no secondary impacts on air quality to be addressed.

The existing TEP is a major emitting facility for nitrogen oxides. It has been estimated (Appendix A-1) that the total actual nitrogen oxides emissions from the Regency Square Property in 1980 was 257 tons per year. The TEP is not a major emitting facility for other criteria pollutants.

The air pollutant emissions resulting from the proposed electric power generating unit will exceed the de minimus emission rate for nitrogen oxides, but will be less than the de minimus emission rates for other criteria pollutants. Since there will be a significant net emissions increase of nitrogen oxides, the proposed modification will be rendered a major modification to a major emitting facility, and therefore will be subject to a full PSD review.

Under the requirements of state and federal PSD regulations, a full PSD review will be required for each pollutant for which a significant net emission increase will occur; in this case, nitrogen oxides. The review will consist of a description of the proposed modification, a determination

of Best Available Control Technology (BACT) for nitrogen oxides, an air quality review consisting of air quality monitoring and air quality modeling and an analysis of the impact of emissions on soils, vegetation and visibility.

The Regency Square Properties is submitting the information in this document as an application for state and federal PSD approval for the proposed modification. The modification is subject to a full PSD review for the criteria pollutant nitrogen oxides. Included in the following sections of this application, in accordance with the requirements of 40 CFR 52.21, are a description of the proposed facility, a review of Best Available Control Technology for nitrogen oxides, an air quality review, and a review of the secondary impacts of emissions from proposed facility.

APPENDIX A-1

Facility Information

SKEC 258-81-01

October 8, 1981

Mr. Clair Fancy
Florida Department of
Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301

Subject: Duval County - AP

Regency Square Properties Permit No. A016-45674

Dear Mr. Fancy:

Regency Square Properties operates a Total Energy Plant at the Regency Square Shopping Center in Jacksonville, Florida. The purpose of this plant is to generate all of the electric power and to provide the heating and air conditioning required by the Regency Square Shopping Center. To generate these engergy requirements Regency Square Properties operates six gas/oil fired engines driving electric generators, seven gas fired engines driving electric generators and two gas fired engines driving air conditioning compressors. Pertinent information regarding the engines is included in Table 1.

On September 1, 1981, the Jacksonville Office of the Florida Department of Environmental Regulation issued the subject air pollution source operating permit to Regency Square Properties. Some of the specific conditions attached to the operating permit are unacceptable to Regency Square Properties. The purpose of this letter is to establish a base air pollutant emission rate for the subject facility that can be used for evaluating the necessity and/or the timing of preparing a PSD Application. The purpose of the PSD Application would be to request the use of 100 percent of the engine operating capacity.

In establishing the emission base I will review the history of the Regency Square Properties Total Energy Plant (TEP). Prior to January 6, 1975, the TEP consisted of nine gas fired Caterpillar engines, each rated at 750 horsepower. Seven of these engines drove 500 kw generators and two drove air conditioning compressors. On October 8, 1975 Regency Square Properties received an FDER Construction Permit to install four Worthington engines of varying sizes; each associated with an electric power generator. These engines can be fired with either diesel fuel or natural gas. In 1978, a fifth Worthington engine/generator was installed.

On August 14, 1981 Regency Square Properties received FDER Construction Permit AC16-40548 to install a sixth Worthington engine to drive a sixth generator. This engine, as with the previous five, can be fired with either diesel fuel or natural gas. The size of all the engines permitted by Regency Square Properties, the generating capacity of the generators driven by the engines, the engine fuel and the date the engines were permitted are summarized in Table 1.

In evaluating air pollutants emitted from the 15 engines, it was determined that nitrogen oxides emissions will be critical. Because of this the remainder of this letter deals only with the nitrogen oxides emissions.

To establish a base nitrogen oxides emission rate from the 15 engines I used a 100 percent operating factor for the nine Caterpillar engines since they were in existence prior to January, 1975 and since the hours of operation were not limited, subsequent to January, 1975, by a Federally enforceable permit condition. For the Worthington engines I used actual emissions that existed during the 1980 period. The actual emissions were based on a test conducted by Dr. Sholtes of our firm on August 10, 1981. Calendar year 1980 emissions were used for the Worthington engines since these emissions represent, the maximum current actual use of these engines.

Caterpillar Engines. Based actual 1980 data, the Caterpillar engines operated a total of 5,610 engine hours and consumed 49.75 million cubic feet of gas. At a heat content of 1,045 Btu per cubic foot, the average heat input to a Caterpillar engine was 9.27 million Btu per engine hour. Since the Caterpillar engines normally operate at 85 percent of rated capacity, the 9.27 million Btu per hour heat input was assumed to be the heat input at 85 percent capacity. At 100 percent rated capacity the heat input to each Catepillar engine would 10.9 million Btu per hour.

Based on the tests conducted by SKEC on August 10, 1981, the average nitrogen oxides emission rate from each Caterpillar engine operating at 100 percent rated capacity is 2.54 pounds per hour. If it is assumed that all nine Caterpillar engines operate at 100 percent capacity for 8,760 hours per year the annual nitrogen oxides emission rate from all nine engines will be 100.3 tons per year. This emission rate was assumed to be the base nitrogen oxide rate for the Caterpillar engines.

Worthington Engines. In 1980 the Worthington engines operated a total of 17,769 engine hours and consumed 96,464 gallons of diesel fuel and 240.77 million cubic feet of natural gas. It is assumed that during these hours of operation the Worthington engines operated at 85 percent of their rated load.

Mr. Clair Fancy Florida Department of Environmental Regulation

The emission measurements conducted by SKEC in August, 1981 showed an average nitrogen oxides emission rate from each Worthington engine of 18.7 pounds per hour at 100 percent rated capacity while being fired with natural gas. No emission measurements were conducted with the engines operating on diesel fuel.

Based on operating records it was determined that during 95 percent of 1980 operating hours the Worthington engines operated on natural gas and during the remaining time they operated on diesel fuel. Using these figures it was calculated that the Worthington engines operated 16,880 hours per year on natural gas. At an emission rate of 18.7 pounds of nitrogen oxides per engine hour at 100 percent rate capacity, or 15.9 pounds per hour at 85 percent rated capacity, it was calculated that the Worthington engines emitted 134.2 tons per year of nitrogen oxides during 1980.

During the 889 engine hours the Worthington engines operated on diesel fuel in 1981, 96,464 gallons of diesel fuel were consumed. In AP-42, Section 3.3.3-Gasoline and Diesel Industrial Engines, Table 3.3.3-1, an emission factor of 469 pounds of nitrogen oxides per 1,000 gallons of diesel fuel is stated (see attached). Using this emission factor, the fuel oil consumed during calendar year 1980 resulted in an annual nitrogen oxide emission of 22.6 tons. The total 1980 nitrogen oxide emission rate from the Worthington engines, resulting from both the combustion of natural gas and diesel fuel, was 156.8 tons per year.

The total nitrogen oxide emission rate from the Regency Square Properties TEP for the 1980 base period was 257.1 tons per year for the Caterpillar and Worthington engines. If the de minimus nitrogen oxide emission rate permitted by Federal PSD Regulations of less than 40 tons per year is added to this base emission rate it is determined that a nitrogen oxide emission rate from the TEP not exceeding 297 tons a year is permissible without triggering a Federal PSD review. I would appreciate your opinion on this base emission rate.

If there are any questions regarding the information contained herein, or if we can provide you with additional information to expedite your review of this matter, please contact me.

Very truly yours,

SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS

John B. Koogler, Ph.D., P.E.

JBK:sc Attachment

cc: Mr. Robert C. Gillander

TABLE 1

SUMMARY OF EQUIPMENT AT REGENCY SQUARE PROPERTIES
TOTAL ENERGY PLANT
JACKSONVILLE, FLORIDA

Unit	Engine Manufacturer	HP- Rating	_ KW Rating	Fuel	Date Permitted	
· 1	Worthington	2,000	1,250	gas/diesel	10-08-75	•
2	Worthington	2,000	1,350		10-08-75	
3	Worthington	2,000	1,350		10-08-75	
4	Worthington	2,700	1,750		10-08-75	• •
5	Worthington	3,800	2,750	55	1978	
6	Worthington	3,000	2,200		08-14-81	
7 - 13	Caterpillar	750 each	500 each	gas	Pre- 1/75	•
14- 15	Caterpillar	750 each	(1)	gas	Pre- 1/75	
	·					

<sup>(1)</sup> These engines drive air conditioning compressors.

# **COMPILATION**

# **OF**

# AIR POLLUTANT EMISSION FACTORS

# **Second Edition**

(Third Printing with Supplements 1-5)

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina
February 1976

3.3.3.4 General. This engine category covers a wide variety of industrial applications of both gasoline and diesel internal combustion power plants, such as fork lift trucks, mobile refrigeration units, generators, pumps, and portable well-drilling equipment. The rated power of these engines covers a rather substantial range—from less than 15 kW to 186 kW (20 to 250 hp) for gasoline engines and from 34 kW to 447 kW (45 to 600 hp) for diesel engines. Understandably, substantial differences in both annual usage (hours per year) and engine duty cycles also exist. It was necessary, therefore, to make reasonable assumptions concerning usage in order to formulate emission factors. I

3.3.3-2 Emissions — Once reasonable usage and duty cycles for this category were ascertained, emission values from each of the test engines <sup>1</sup> were aggregated (on the basis of nationwide engine population statistics) to arrive at the factors presented in Table 3.3.3-1. Because of their aggregate nature, data contained in this table must be applied to a population of industrial engines rather than to an individual power plant.

The best method for calculating emissions is on the basis of "brake specific" emission factors (g/kWh or lb/hphr). Emissions are calculated by taking the product of the brake specific emission factor, the usage in hours (that is, hours per year or hours per day), the power available (rated power), and the load factor (the power actually used divided by the power available).

Table 3.3.3-1. EMISSION FACTORS FOR GASOLINE-AND DIESEL-POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

	Engine c	ategory <sup>b</sup>	
Pollutant <sup>a</sup>	Gasoline	Diesel	
Carbon monoxide			
g/hr	5700.	197.	
lb/hr	12.6	0.434	
g/k Wh	267.	4.06	
g/hphr	199.	3.03	
kg/10 <sup>3</sup> liter	472.	12.2	
lb/10 <sup>3</sup> gal	3940.	102.	
Exhaust hydrocarbons			
g/hr	191.	72.8	
lb/hr	0.421	0.160	
g/kWh	. 8.95	1.50	
g/hphr	6.68	1.12	
kg/10 <sup>3</sup> liter	15.8	4.49	
lb/10 <sup>3</sup> gal	132.	37.5	
Evaporative hydrocarbons			
g/hr	62.0	_	
lb/hr	0.137	-	
Crankcase hydrocarbons	÷		
g/hr	38.3	_	
lb/hr	0.084		

#### Table 3.3.3-1. (continued). EMISSION FACTORS FOR GASOLINE-AND DIESEL POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

	Engine ca	ategoryb	
Pollutant <sup>a</sup>	Gasoline	Diesel	
Nitrogen oxides		-	
g/hr	148.	910.	
lb/hr	0.326	2.01	
g/kWh	6.92	18.8	
g/hphr	5.16	14.0	
kg/10 <sup>3</sup> liter	12.2	56.2	
lb/10 <sup>3</sup> gal	102.	469.	
Aldehydes		]	
g/hr	6.33	13.7	
lb/hr	0.014	0.030	
g/kWh	0.30	0.28	
g/hphr	0.22	0.21	
kg/10 <sup>3</sup> liter	0.522	0.84	
lb/10 <sup>3</sup> gal	4.36	7.04	
Sulfur oxides			
g/hr	7.67	60.5	
lb/hr	0.017	0.133	
g/kWh	0.359	1.25	
g/hphr	0.268	0.931	
kg/10 <sup>3</sup> liter	0.636	3.74	
lb/10 <sup>3</sup> gal	5.31	31.2	
Particulate -		-	
g/hr	9.33	65.0	
lb/hr	0.021	0.143	
g/kWh	0.439	1.34	
g/hphr	0.327	1.00	
kg/10 <sup>3</sup> liter	0.775	4.01	
lb/10 <sup>3</sup> gal	6.47	33.5	

References 1 and 2.

### References for Section 3.3.3

- 1. Hare, C. T. and K. J. Springer. Exhaust Emissions from Uncontrolled Vehicles and Related Equipment Using Internal Combustion Engines. Final Report. Part 5: Heavy-Duty Farm, Construction, and Industrial Engines. Southwest Research Institute. San Antonio, Texas. Prepared for Environmental Protection Agency, Research Triangle Park, N.C., under Contract No. EHS 70-108. October 1973. 105 p.
- 2. Hare, C. T. Letter to C. C. Masser of the Environmental Protection Agency concerning fuel-based emission rates for farm, construction, and industrial engines. San Antonio, Tex. January 14, 1974.

bAs discussed in the text, the engines used to determine the results in this table cover a wide range of uses and power. The listed values do not, however, necessarily apply to some very large stationary diesel engines.

#### 2.0 FACILITY DESCRIPTION

## 2.1 The Facility

The Regency Square Properties Total Energy Plant is located at 9501 Arlington Expressway in Jacksonville, Florida. This is near the intersection of the Arlington Expressway and Atlantic Boulevard. The location of the facility is further defined by UTM coordinates 447.170 kilometers east and 3354.610 kilometers north. The location of the site is shown in Figures 2-1 through 2-3.

The purpose of the Total Energy Plant (TEP) is to generate all of the electric power and to provide heating and air conditioning required by the Regency Square Shopping Center and adjoining office complex owned by Regency Square Properties. The TEP presently operates five natural gas/diesel fired engines driving electric power generators, seven natural gas fired engines driving electric power generators and two natural gas fired engines driving air conditioning compressors. The nine natural gas fired engines, each rated at 750 horsepower, were installed prior to 1975. On January 8, 1975, Regency Square Properties received a FDER construction permit to install four of the natural gas/diesel fired engines; Worthington engines and the associated electric power generators. In 1979, a fifth Worthington engine/generator was installed and on August 14, 1981 a FDER construction permit (AC16-40548) was issued to Regency Square Properties to install a sixth Worthington engine/generator.

One of the provisions of permit AC16-40548 was that the sixth Worthington engine was a replacement for the Worthington engine installed in 1979. The 1979 engine/generator, referred to as Unit No. 5 suffered serious component failure in the crank shaft and the lower bed section and was retired from service. The retirement of this engine was a provision of the 1981 construction permit.

During the negotiations with FDER leading to the issuance of construction permit AC16-40548, it was agreed that when Worthington Unit No. 5 was repaired, a construction permit application and a PSD application would be filed with FDER. The purpose of this application is to satisfy the terms of this agreement.

Table 2-1 summarizes the history of the installation of the various generating units installed at the Regency Square Property TEP and summarizes the fuels and generating capacities of these units.

The Worthington generating set No. 5 consisting of a 3,800 horsepower reciprocating engine fired with either natural gas or diesel fuel and a 2,750 kilowatt electric powered generator was originally built by Worthington in 1969. The unit was acquired by Regency Square Properties in 1979 and placed in operation in June of 1979. In May, 1981 the engine associated with this unit suffered serious component failure in the crank shaft and lower bed section. The unit was retired for repair and de-permitted in August of 1981.

The Worthington engine associated with the generating set is a 12 cylinder engine. Each cylinder has a bore of 14.5 inches and a stroke of 18 inches. The design operating speed of the engine is 450 rpm and the design brake mean effective pressure of the engine is 189.5 pounds per square inch. The engine is nominally rated to deliver 3,800 brake horsepower and requires a heat input of 10,400 BTU for each kilowatt of electric power delivered from the generator.

The design generating capacity of the generator associated with this generating set is 2,750 kilowatts. During normal operations, the unit is operated to deliver approximately 85 percent of electric power rated capacity. If the demand requires, however, the unit can produce the designed electrical output for short periods of time.

All of the Worthington generating sets operated at the Regency Square Properties TEP are designed to operate on either natural gas or diesel fuel. Natural gas is used as the primary fuel and diesel fuel is used for stand-by. Based on 1980 operating records, it was determined that the Worthington generating units operated 95 percent of the time on natural gas and 5 percent of the time on diesel fuel (Appendix A-1).

## 2.2 Emission Estimates

The air pollutants that will be emitted from the proposed Worthington generating Unit No. 5 will include particulate matter, sulfur dioxide, nitrogen oxides, hydrocarbons and carbon monoxide. The emission rate of these pollutants will vary depending upon whether natural gas or diesel fuel is used to fire the engine. It has been calculated, regardless of the fuel used, that nitrogen oxides will be emitted at a significant emission rate but that the other criteria pollutants will be emitted at a rate less than the de minimus emission rate defined in the PSD regulation.

The emission rate calculations for nitrogen oxides and hydrocarbons were based on emission test data from Worthington generating units 1-4 and 6 collected at the Regency Square Property TEP by Sholtes & Koogler, Environmental Consultants, Inc. in March 1982. These test data have been reported to FDER. The emission rates of criteria pollutants particulate matter, sulfur dioxide and carbon monoxide were calculated based on emission factors published in the document Compilation of Air Pollutant Emission Factors, USEPA, AP-42. The emission calculations are detailed in Appendix A-2.

There will be no fugitive emissions associated with the operation of Worthington generating Unit No. 5. There will be no additional traffic resulting from the operation of this unit and the expansion to the Regency Square Properties complex necessitating the installation of generating set No. 5 has previously been addressed through the complex source permitting procedure.

The hourly and annual emission rates of all the pollutants that will be emitted as a result of the operation of Worthington generating Unit No. 5 are summarized in Table 2-2. In reviewing this table, it will be noted that the operating time of Unit No. 5, while fired with diesel fuel, is limited to not more than 6,570 hours per year in order to limit the particulate matter emission rate to less than the de minimus emission level. This provision will be accepted as a provision of the permit issued for this source.

### TABLE 2-1.

## HISTORY AND CHARACTERISTICS OF REGENCY SQUARE PROPERTIES TEP GENERATING UNITS

Unit	Er	perati gine HP)	G	oacity enerator ilowatts)		Fuel		Permitted Retired	
Worthington							 		
	2	,000	1	250		gas/diesel		10/75	
2		,000		350		gas/diesel		10/75	
<b>3</b> ,		,000		350		gas/diesel		10/75	
4 5	2	700	1,	750		gas/diesel		10/75	
5	. 3	,800	2	,750		gas/diesel		6/79 (1)	
							Retir	red 8/81(1)	)
C	2	000	2	200	,	asa/diasal	Reper	rmitted <sub>3</sub> ]982 <sup>(2</sup> 8/81	′
6	3	,000		,200	•	gas/diesel		0/01	
Caterpillar									
1-7	`	750		500		gas	Pre -		
8,9		750	AC (	Compresso	rs	gas	Pre -	- 1975	
·. ·									

<sup>(1)</sup> Retired and de-permitted due to engine component failure.

<sup>(2)</sup> Engine/generator No. 5 is to be repermitted, under this application, as a new source.

<sup>&</sup>lt;sup>(3)</sup> Permitted as a replacement to engine/generator No. 5.

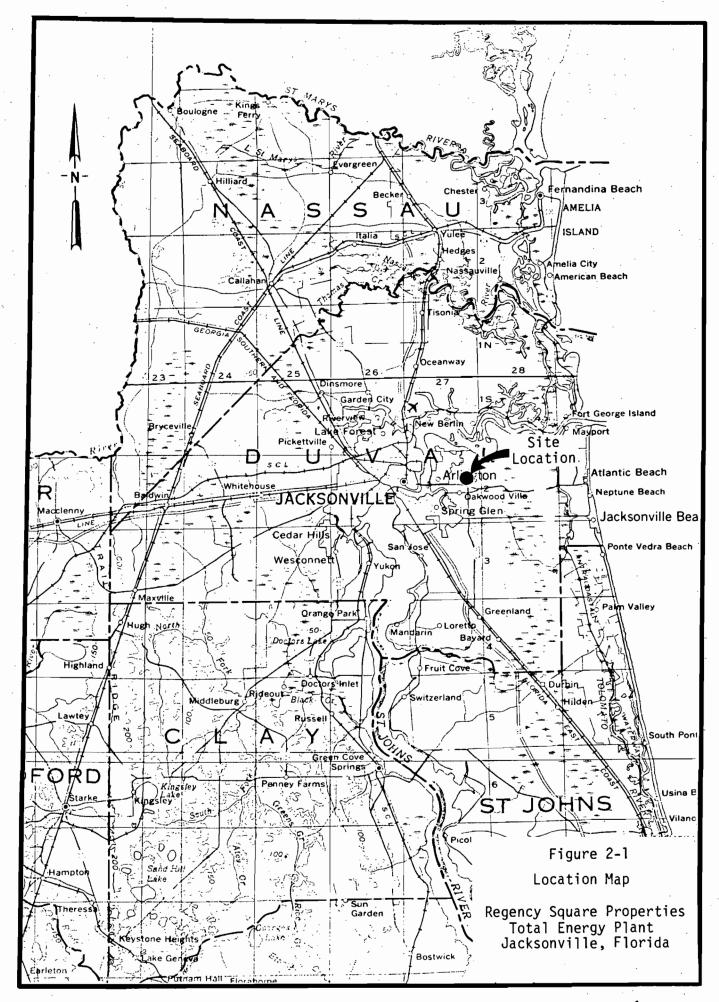
TABLE 2-2

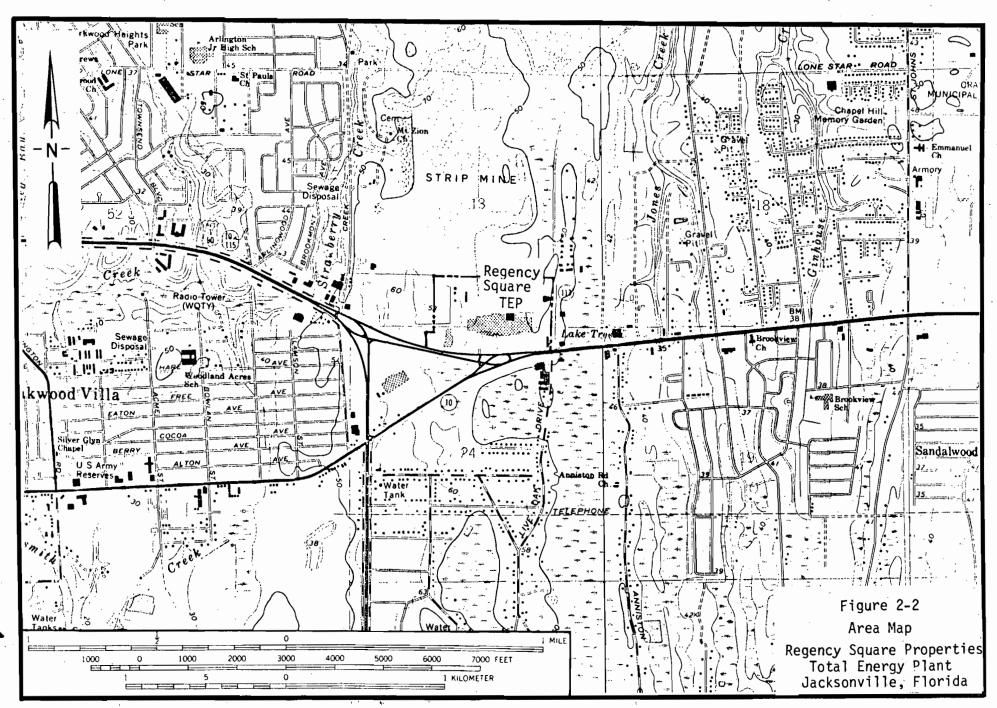
### SUMMARY OF EMISSIONS FROM PROPOSED ADDITION TO REGENCY SQUARE PROPERTIES TOTAL ENERGY PLANT

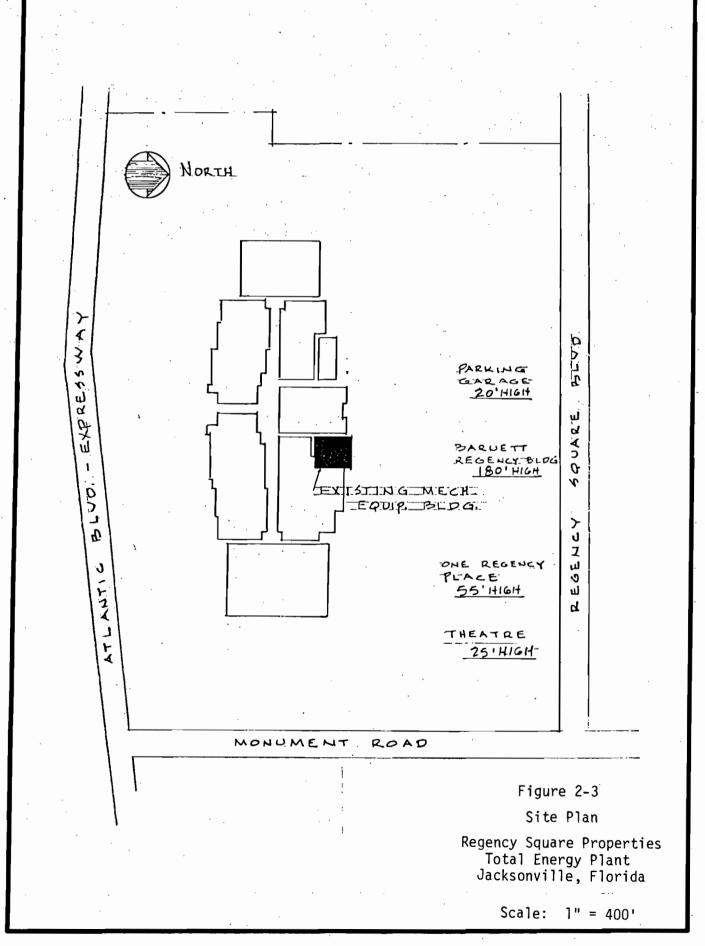
	Natural Gas Emissions 0 8,760 hrs/yr		Diesel Fuel @ 6,570 h	Significant Emission	
<u>Pollutant</u>	(1b/hr)	(tpy)	(1b/hr)	(tpy)	Rate Increase
Part.Matter	<0.1	<b>&lt;0.</b> 1	6.9	22.7	25
SO <sub>2</sub>	<0.1	0.1	6.4	21.0	40
NOx	45 <del>.6-</del> 25194	<del>199.9</del> 113.62	25 <del>,2</del> 22,24	<del>82.8</del> 73.06	40
HC ·	3.5	15.3	1.4	4.5	40
CO	11.8	51.7	21.0	69.0	100

Operating time of diesel fuel is limited to 6,570 hours per year to reduce particulate matter emissions increase below 25 tons per year. Unit No. 5 can operate 75 percent of the time or less (to 0%) on diesel fuel and 25 percent of the time or more (to 100%) on natural gas with only the emission rate of NOx exceeding the de minimus emission rate.

BACT: 700 PPMV, NG 600 11, Diesel







APPENDIX A-2

Emission Rate Calculation

REGENCY SQUARE PROPERTIES
TOTAL ENERGY PLANT

EMISSION RATE CALCULATIONS

WORTHINGTON GENERATING SET NO 5

## SPECIFICATIONS

ENGINE - 3800 horsepower

FUEL - NATURAL GAS Capprox 95% of time

DIESEL FUEL Capprox 5% of time

GENERATOR - 27,50 KW

HEAT INPUT - 10, 400 BTU/KW

FUEL CONSUMPTION

GAS @ 1945 BT4 / ft3

= 2750 kw x 10400 BTU/KW x 1/1045 BTU/ft3

= 27,368 ft3/(hour)

= 0.0274×106 ft3/hr

1 DIESEL @ 139,000 BTu/gal

= 2750 × 10400 x 1/139,000 BT4/gel

= 206 gellons / (hour)

# EMISSION FACTORS

42.382 100 SHEFTS 5 SQUARE

NOx - SKEC test data of 3/30-31/82

Northing ton Generator	Generating Load During Test (Kw)	NOx Emissions es Noz (16/hr)	Emission - Factor 15 NO./KWH
No 4-011	1200	13.79	0.0092¥
No 4- 503	1200	10.78	0.0072
No 6 - gas	1670	27.64	0.0166 *

\* Use these emission factors for Proposed Unit No 5

Enox (units) = 2750 KW x 0.0166 15 NOx/KWH = 45.65 16/hr

= 199.9 tons/yr @ 8760 hr/yr

DIESEL

Enox (Units) = 2750 kw x 0.0092 = 25.22 lb/hn

= 110.5 toy

HYDROCARBONS - SKEC test data of 3/50-31/82

Worthing ton Generator	Generating Load During Test (kw)	HC(total) Emissions (16/hr)	Factor BHC/KWH
No 4 - 0.1	1500	0.71	0.0005
No 4 - 303	1500	23.78	0.0159
No 6 - 943	1670	68.52	0.0410

## HYDROCARBONS (CON'T)

A ssume the emission factor of 0.0005 16 HC. per KWH accounts for the non-methane HC from Unit No 4; is the emissions while fired with diesel feel.

Assume the same non-methane It C emission factor applies to Unit No 4 when fired with natural gas. The excess It emissions from the engine, when fired with gas (0.0159 - 0.0005 = 0.0154 lb HC/KWH), result from natural gas (methane) blowing by the piston rugs.

The ratio of non-methode HC to total HC, therefore, 15:

0,005/0.0159 = 0.031

Assume this ratio also applies to the No 5 and No 6 Units

## <u>GAS</u>

EHC (Unit 5) = 2750 KW x 0.0410 16 total HC/KWH Non-methane x 0.031 16 non-methane HC/16 total HC

= 15.3 try @ 8760 hr/yr

## DIESEL

EHC(Units) = 2750 x 0.0005 16 HC/KWH Non-methode = 1.3816/hr

= 6.0 try @ 8760 hr/yr

## CARBON MONOXIDE

GAS @ 430 16/106 ft3 (AP-42, Sup 6, Sect 332)

= 43016/10° ft3 x 0.0274x10° ft3/hr

= 11.816/hr

= 51.7 try @ 8760 hr/yr

DIESEL @ 102 16/1000 gal (AP-42, Sup 1-5, Sect 3.3.3)

= 102 15/1000 gel x 206 gel/hr

= 21.016/hr

= 92.0 tpy @ 8760 hr/yr

# SULFUR DIOXIDE

GAS @ 0.6 15 / 10 6 ft 3 (AP-42)

= 0.6 x 0.0274 x 106 ft 7/6 ~

= 0.02 lb/hr

= 0.09 tpy @ 8760 (r/yr

DIESEL @ 31.2 16/1000 gal (AP-42)

= 31.2 x 206gal/hr

= 6.4 16/hr

= 28.0 try @ 8760 ha/yr

PARTICULATE MATTER

6AS @ Neg (AP-42)

= . < 0. 1 lb/hr

= < 0.1 try @ 8760 hr/yr

DIESEL @ 33.5 15/1000gal (AP-42)

= 33.5 x 206 gal/hr

= 6.9 16/hr

= 30.2 tpy @ 8760 hn/yr

= 22.7 tpy @ 6570 hr/yr

3.3.2.1 General — Engines in the natural gas industry are used primarily to power compressors used for pipeline transportation, field gathering (collecting gas from wells), underground storage, and gas processing plant applications. Pipeline engines are concentrated in the major gas producing states (such as those along the Gulf Coast) and along the major gas pipelines. Both reciprocating engines and gas turbines are utilized, but the trend has been toward use of large gas turbines. Gas turbines emit considerably fewer pollutants than do reciprocating engines; however, reciprocating engines are generally more efficient in their use of fuel.

3.3.2.2 Emissions and Controls 1.2 — The primary pollutant of concern is NO<sub>X</sub>, which readily forms in the high temperature, pressure, and excess air environment found in natural-gas-fired compressor engines. Lesser amounts of carbon monoxide and hydrocarbons are emitted, although for each unit of natural gas burned, compressor engines (particularly reciprocating engines) emit significantly more of these pollutants than do external combustion boilers. Sulfur oxides emissions are proportional to the sulfur content of the fuel and will usually be quite low because of the negligible sulfur content of most pipeline gas.

The major variables affecting  $NO_X$  emissions from compressor engines include the air fuel ratio, engine load (defined as the ratio of the operating horsepower divided by the rated horsepower), intake (manifold) air temperature, and absolute humidity. In general,  $NO_X$  emissions increase with increasing load and intake air temperature and decrease with increasing absolute humidity and air fuel ratio. (The latter already being, in most compressor engines, on the "lean" side of that air fuel ratio at which maximum  $NO_X$  formation occurs.) Quantitative estimates of the effects of these variables are presented in Reference 2.

Because  $NO_X$  is the primary pollutant of significance emitted from pipeline compressor engines, control measures to date have been directed mainly at limiting  $NO_X$  emissions. For gas turbines, the most effective method of controlling  $NO_X$  emissions is the injection of water into the combustion chamber. Nitrogen oxides reductions as high as 80 percent can be achieved by this method. Moreover, water injection results in only nominal reductions in overall turbine efficiency. Steam injection can also be employed, but the resulting  $NO_X$  reductions may not be as great as with water injection, and it has the added disadvantage that a supply of steam must be readily available. Exhaust gas recirculation, wherein a portion of the exhaust gases is recirculated back into the intake manifold, may result in  $NO_X$  reductions of up to 50 percent. This technique, however, may not be practical in many cases because the recirculated gases must be cooled to prevent engine malfunction. Other combustion modifications, designed to reduce the temperature and/or residence time of the combustion gases, can also be effective in reducing  $NO_X$  emissions by 10 to 40 percent in specific gas turbine units.

For reciprocating gas-fired engines, the most effective  $NO_X$  control measures are those that change the air-fuel ratio. Thus, changes in engine torque, speed, intake air temperature, etc., that in turn increase the air-fuel ratio, may all result in lower  $NO_X$  emissions. Exhaust gas recirculation may also be effective in lowering  $NO_X$  emissions although, as with turbines, there are practical limits because of the large quantities of exhaust gas that must be cooled. Available data suggest that other  $NO_X$  control measures, including water and steam injection, have only limited application to reciprocating gas-fired engines.

Emission factors for natural-gas-fired pipeline compressor engines are presented in Table 3.3.2-1.

12:

#### Table 3.3.2-1. EMISSION FACTORS FOR HEAVY-DUTY, NATURAL-GAS-FIRED PIPELINE COMPRESSOR ENGINES<sup>®</sup>

#### EMISSION FACTOR RATING: A

	Nitrogen oxides (as NO <sub>2</sub> ) <sup>b</sup>	Carbon monoxide	Hydrocarbons (as C) <sup>C</sup>	Sulfur dioxide <sup>d</sup>	Particulate <sup>e</sup>
Reciprocating engines		· · · · · ·			
lb/10 <sup>3</sup> hp hr	24	3.1	9.7	0.004	NA
g/hp-hr	11	1.4	4.4	0.002	NA
g/kW-hr	15	1.9	5.9	0.003	NA
lb/106 scff	3,400	430	1,400	0.6	· NA
kg/106 <u>N</u> m3f	55,400	7,020	21,800	9.2	NA
Gas turbines					
lb/10 <sup>3</sup> hp-hr	2.9	1.1	0.2	0.004	NA
g/hp-hr	1.3	0.5	0.1	0.002	NA
g/kW-hr	1.7	0.7	0.1	0.003	NA
lb/10 <sup>6</sup> scf <sup>g</sup>	300	120	23	0.6	NA
kg/10 <sup>6</sup> Nm <sup>3</sup> g	4,700	1,940	280	9.2	NA

<sup>&</sup>lt;sup>8</sup>All factors based on References 2 and 3.

#### References for Section 3.3.2

- Standard Support Document and Environmental Impact Statement Stationary Reciprocating Internal Combustion Engines. Aerotherm/Acurex Corp., Mountain View, Calif. Prepared for Environmental Protection Agency, Research Triangle Park, N.C. under Contract No. 68-02-1318, Task Order No. 7, November 1974.
- Urban, C.M. and K.J. Springer. Study of Exhaust Emissions from Natural Gas Pipeline Compressor Engines. Southwest Research Institute, San Antonio, Texas. Prepared for American Gas Association, Arlington, Va. February 1975.
- 3. Dietzmann, H.E. and K.J. Springer. Exhaust Emissions from Piston and Gas Turbine Engines Used in Natural Gas Transmission. Southwest Research Institute, San Antonio, Texas. Prepared for American Gas Association, Arlington, Va. January 1974.

bThese factors are for compressor engines operated at rated load. In general, NO<sub>x</sub> emissions will increase with increasing load and intake (manifold) air temperature and decrease with increasing air-fuel ratios (excess air rates) and absolute humidity. Quantitative estimates of the effects of these variables are presented in Reference 2.

<sup>&</sup>lt;sup>c</sup>These factors represent total hydrocarbons. Nonmethane hydrocarbons are estimated to make up to 5 to 10 percent of these totals, on the average.

dBased on an assumed sulfur content of pipeline gas of 2000 gr/10<sup>6</sup> scf (4600 g/Nm<sup>3</sup>). If pipeline quality natural gas is not fired, a material balance should be performed to determine SO<sub>2</sub> emissions based on the actual sulfur content.

Not available from existing data.

These factors are calculated from the above factors for reciprocating engines assuming a heating value of 1060 Btu/scf (9350 kcal/<u>N</u>m<sup>3</sup>) for natural gas and an average fuel consumption of 7500 Btu/hp-hr (2530 kcal/kW-hr).

These factors are calculated from the above factors for gas turbines assuming a heating value of 1,050 Btu/scf (9,350 kcal/ Nm<sup>3</sup>) of natural gas and an average fuel consumption of 10,000 Btu/hp-hr (3,380 kcal/kW-hr).

3.3.3-1 General This engine category covers a wide variety of industrial applications of both gasoline and diesel-internal combination power plants, such as fork lift trucks, mobile refrigeration units, generators, pumps, and portable well-drilling equipment. The rated power of these engines covers a rather substantial range—from less than 15 kW to 186 kW (20 to 250 hp) for gasoline engines and from 34 kW to 447 kW (45 to 600 hp) for diesel engines. Understandably, substantial differences in both annual usage (hours per year) and engine duty cycles also exist. It was necessary, therefore, to make reasonable assumptions concerning usage in order to formulate emission factors. I

3.3.3-2 Emissions — Once reasonable usage and duty cycles for this category were ascertained, emission values from each of the test engines <sup>1</sup> were aggregated (on the basis of nationwide engine population statistics) to arrive at the factors presented in Table 3.3.3-1. Because of their aggregate nature, data contained in this table must be applied to a population of industrial engines rather than to an individual power plant.

The best method for calculating emissions is on the basis of "brake specific" emission factors (g/kWh or lb/hphr). Emissions are calculated by taking the product of the brake specific emission factor, the usage in hours (that is, hours per year or hours per day), the power available (rated power), and the load factor (the power actually used divided by the power available).

Table 3.3.3-1. EMISSION FACTORS FOR GASOLINE-AND DIESEL-POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

	Engine c	ategory <sup>b</sup>	
Pollutanta	Gasoline	Diesel	
Carbon monoxide			
g/hr	5700.	197.	
lb/hr	12.6	0.434	
g/kWh	267.	4.06	
g/hphr	199.	3.03	
kg/10 <sup>3</sup> liter	472.	12.2	
· lb/10³ gal	3940.	102.	
Exhaust hydrocarbons			
g/hr	191.	72.8	
lb/hr	0.421	0.160	
g/kWh	8.95	1.50	
g/hphr	6.68	1.12	
kg/10 <sup>3</sup> liter	15.8	4.49	
lb/10 <sup>3</sup> gal	132.	37.5	
Evaporative hydrocarbons			
g/hr	62.0	_	
lb/hr	0.137	-	
Crankcase hydrocarbons			
g/hr	38.3		
lb/hr	0.084	_	

Table 3.3.3-1. (continued). EMISSION FACTORS FOR GASOLINE-AND DIESEL-POWERED INDUSTRIAL EQUIPMENT EMISSION FACTOR RATING: C

	Engine ca	tegoryb	
Pollutant <sup>a</sup>	Gasoline	Diesel	
Nitrogen oxides			
g/hr	148.	910.	
lb/hr	0.326	2.01	
g/kWh	6.92	18.8	
g/hphr	5.16	14.0	
kg/10 <sup>3</sup> liter	12.2	56.2	
lb/10 <sup>3</sup> gal	102.	469.	
Aldehydes			
g/hr	6.33	. 13.7	
lb/hr	0.014	0.030	
g/kWh	0.30	0.28	
g/hphr	0.22	0.21	
kg/10 <sup>3</sup> liter	0.522 ^	0.84	
lb/10 <sup>3</sup> gal	4.36	7.04	
Sulfur oxides			
g/hr	7.67	60.5	
lb/hr	0.017	0.133	
g/kWh	0.359	1.25	
g/hphr	. 0.268	0.931	
kg/10 <sup>3</sup> liter	0.636	3.74	
lb/10 <sup>3</sup> gal	5.31	31.2	
Particulate	,		
g/hr	9.33	65.0	
lb/hr	0.021	0.143	
g/kWh	0.439	1.34	
g/hphr	0.327	1.00	
kg/10 <sup>3</sup> liter	0.775	4.01	
lb/10 <sup>3</sup> gal	6.47	33.5	

<sup>&</sup>lt;sup>a</sup>References 1 and 2.

### References for Section 3.3.3

- 1. Hare, C. T. and K. J. Springer. Exhaust Emissions from Uncontrolled Vehicles and Related Equipment Using Internal Combustion Engines. Final Report. Part 5: Heavy-Duty Farm, Construction, and Industrial Engines. Southwest Research Institute. San Antonio, Texas. Prepared for Environmental Protection Agency, Research Triangle Park, N.C., under Contract No. EHS 70-108. October 1973. 105 p.
- 2. Hare, C. T. Letter to C. C. Masser of the Environmental Protection Agency concerning fuel-based emission rates for farm, construction, and industrial engines. San Antonio, Tex. January 14, 1974.

<sup>&</sup>lt;sup>b</sup>As discussed in the text, the engines used to determine the results in this table cover a wide range of uses and power. The listed values do not, however, necessarily apply to some very large stationary diesel engines.

### 3.0 BEST AVAILABLE CONTROL TECHNOLOGY

The Best Available Control Technology (BACT) is required to control emissions of all regulated pollutants emitted at greater than the de minimus emission rate. In the case of the No. 5 generating unit at Regency Square Properties TEP, this requirement applies to only nitrogen oxides.

Techniques available for controlling nitrogen oxides emissions from stationary reciprocating natural gas and diesel fuel fired engines are limited. Alternatives include exhaust gas recirculation and water injection. Both of these techniques are discussed to a limited extent in the document Compilation of Air Pollutant Emission Factors, USEPA, AP-42, Supplement 4, Section 3.3.3 (See Appendix A-2). In this document it is stated that water injection has found limited application with reciprocating engines and that the use of exhaust gas recirculation is limited due to the necessity of cooling large volumes of exhaust gas prior to recirculation.

A third technique for controlling nitrogen oxides emissions, addressed in the same document, is the adjustment of the air to fuel ratio to maintain optimum engine operating conditions.

In evaluating BACT alternatives two factors must be taken into consideration. First, the proposed generating Unit No. 5 was originally constructed in 1969. To modify the engine for water injection or exhaust gas recirculation would involve a major level of effort. Secondly, the annual impact of

nitrogen oxides emissions from Unit No. 5, when operating 8,760 hours per year, will be 3.6 micrograms per cubic meter. This impact compares with a significant impact level defined by PSD regulations of 14.0 micrograms per cubic meter annual average and an ambient air quality standard for nitrogen oxides of 100 micrograms per cubic meter annual average.

Taking these factors into consideration, Regency Square Properties proposes as BACT a maintenance program to maintain generating Unit No. 5 at an efficient operating level and the adjustment of the air to fuel ratio to maintain optimum engine operating conditions.

The nitrogen oxides emission rate, expressed as nitrogen dioxide  $(NO_2)$  from the proposed No. 5 generating unit is 45.6 pounds per hour when fired  $25.94 \ (113.9274)$  with natural gas and operating at 100 percent rated capacity (2750 kilowatts generating capacity) or 1.60 pounds of nitrogen oxides (as  $NO_2$ ) per million BTU heat input. When fired with diesel, the maximum nitrogen oxides emission rate is 25.2 pounds per hour or 0.88 pounds per million  $23.24 \ (73.06184)$ 

### 4.0 AIR QUALITY REVIEW

## 4.1 Existing Air Quality Data

The Duval County Bio-Environmental Services operate two continuous nitrogen oxide monitors in Duval County. One of the monitors is located at Kooker Park in an industrial zone west of the St. Johns River. This monitoring site is approximately 9.2 kilometers west-northwest of Regency Square and is identified by SAROAD Site No. 1960-032-H02. The second monitoring site is located at the Naval Air Station south of Jacksonville. This site is approximately 15.7 kilometers southwest of Regency Square and is identified by SAROAD Site No. 1960-070-H01.

The monitor at Kooker Park has been in operating since June, 1980. During the period June, 1980 through December, 1980 the six month average nitrogen oxides level reported at this monitoring site was 33 micrograms per cubic meter, reported as  $\mathrm{NO}_2$ . During calendar year 1981 the annual average nitrogen oxides level at this site was again 33 micrograms per cubic meter reported at  $\mathrm{NO}_2$ . At the Naval Air Station, the nitrogen oxides monitor has been in operation since September, 1980. During the period September 1980 through December 1980 the four-month average nitrogen oxides level reported at the site was 29 micrograms per cubic meter. During calendar year 1981, the annual average nitrogen oxides level reported at this site was 21 micrograms per cubic meter reported as  $\mathrm{NO}_2$ .

For purposes of this PSD application it has been assumed that a conservative nitrogen oxides background level for the Regency Square area is 33 micrograms per cubic meter, annual average, reported at  $NO_2$ . As a point of reference, the impact of all existing generating units at the Regency Square TEP were recently modeled and determined to be less than 18 micrograms per cubic meter (Appendix A-4-1).

## 4.2 <u>Meteorological Data</u>

The air quality review required for this PSD application requires a five year record of meteorological data. Since air quality modeling will be conducted only for nitrogen oxides and since the only air quality standard applicable to nitrogen oxides is the annual average standard, a five year summary of meteorological data in the STAR format will satisfy the requirements for meteorological data.

A five year summary of Jacksonville meteorological data in the STAR format with five stability classes was obtained from US EPA, Region IV, Atlanta, Georgia. These data represent the time period 1970-1974. A listing of these meteorological data are included in the computer printouts included in Appendix A-4.

## 4.3 <u>Emission Data</u>

Since air quality monitoring data were used to establish background nitrogen oxides levels for all existing sources, the modeling requirements of this PSD application are limited to evaluating the impact of

the proposed source at the Regency Square TEP plus emissions from other units at the facility installed within the past five years. This requirement necessitates the modeling of the emissions from proposed generating unit No. 5 and from generating unit No. 6 which was permitted in August, 1981. All other generating units at the Regency Square TEP were permitted more than five years before the date of this application (See Table 2-1).

The emission data and stack parameters for generating units No. 5 and 6 are summarized in Table 4-1.

## 4.4 Air Quality Modeling

The requirements for air quality modeling are limited to evaluating the annual average impact of nitrogen oxides from the Regency Square TEP Unit No. 5 and Unit No. 6. The background level of nitrogen oxides resulting from emissions from the other generating units at the Regency Square TEP and other sources of nitrogen oxides in the Duval County area are accounted for in the background level of nitrogen oxides derived from air quality monitoring data as discussed in Section 4.1.

The annual average impact of nitrogen oxides emissions from the two Regency Square TEP sources were evaluated using the Industrial Source Complex Long-Term (ISC-LT) air quality model. The source data input to the model are summarized in Table 4-1. The meteorological data input to the model, as discussed in Section 4.2, are Jacksonville meteorological data representing the period 1970-1974. The receptor grid used in the

modeling was a 2.8 kilometer square grid with the Regency Square TEP located at the center of the grid. The spacing between grid points was 0.2 kilometers both in the north/south direction and in the east/west direction.

Since the stacks of generating Units No. 5 and 6 are relatively low compared with the height and width of the shopping complex in which the TEP is located, the building wake effect was taken into consideration in the modeling. For purposes of modeling the building height was taken as 8.2 meters and the building width was taken as 150 meters.

The output of the ISC model is included in Appendix A-4-2. From this model run it was determined that the maximum annual nitrogen oxides impact resulting from the emissions from Regency Square TEP units No. 5 and No. 6 was 5.65 micrograms per cubic meter. It was estimated (Appendix A-4-2) that the impact of the emissions from Unit No. 5 was 3.2 micrograms per cubic meter, annual average, and the impact of emissions from No. 6 unit were 2.5 micrograms per cubic meter, annual average. The location of the point of maximum impact was 0.76 kilometers east-northeast of the TEP.

The impact of emissions from the two generating units, 5.65 micrograms per cubic meter, is much less than the federally defined significant impact level for nitrogen oxides of 14.0 micrograms per cubic meter, annual average. The impact, when added to the background nitrogen

## 4.5 Summary

Based on the air quality review conducted to evaluate the emissions of the proposed source, it can be concluded that the source can be operated at maximum capacity and for 8,760 hours per year without causing or contributing to an exceedance of the nitrogen oxides ambient air quality standard. It can also be concluded that the impact of the proposed unit is only 22 percent of the significant impact level for nitrogen oxides as defined by the federal PSD regulations.

### TABLE 4-1

SUMMARY OF  $\mathrm{NO}_{\mathrm{X}}$  EMISSIONS AND SOURCE PARAMETERS

REGENCY SQUARE PROPERTIES TOTAL ENERGY PLANT

NO <sub>x</sub> Emissions (1)		Stack		Stack Gas		
Source	(1b/hr)	(tpy) (2)	Ht. (m)	Dia. (m)	Vel. (m/s)	Temp. (°K)
No. 5	4 <del>5.</del> 6 25.94	<del>199.9</del> 113.62	17.3	0.61	21.4	753
No. 6	36.4	159.6	17.3	0.61	17.1	753

<sup>(1)</sup> NO $_{\rm x}$  emissions based on natural gas firing; the maximum NO $_{\rm x}$  emission rate (See Appendix A-2) and an operating factor of 100 percent rated capacity.

<sup>(2)</sup> Based on 8760 hours per year operating time.

CHOLIES A KOOCHER

APPENDIX A-4-1

Background Air Quality Modeling - Regency Square TEP SKEC 258-81-01

June 21, 1982

Mr. Robert C. Gillander, Jr. Regency Square Properties Barnett Regency Tower Suite 1200 Jacksonville, Florida 32211

Dear Mr. Gillander:

This letter report, describing the impact of nitrogen oxides emissions from the Regency Square Properties Total Energy Plant on ambient air quality, was prepared to satisfy a Florida Department of Environmental Regulation and a Duval County Bio-Environmental Services requirement related to the permitting of the Total Energy Plant.

On December 8, 1981, Sholtes & Koogler, as a representative of Regency Square Properties, met with DER and BES representatives in Tallahassee. One of the items agreed upon at that meeting was an air quality review which would describe the ambient impact of nitrogen oxides emissions from the Regency Square Properties Total Energy Plant on ambient air quality. This requirement was confirmed in a letter to you from Mr. Jerry Woosley of BES dated December 18, 1981.

Specifically, the requirement for the air quality review stated that the review would be performed to determine the ambient impact of nitrogen oxides emissions from Worthington generators 1, 2, 3, 4 and 6 and the 9 Caterpillar engines, with all engines operating at maximum load and operating 8,760 hours per year. The emission rates used in the air quality review were to be determined by emission measurements.

On March 30 and 31, 1982, SKEC conducted nitrogen oxides emission measurements on the five Worthington engines and one typical Caterpillar engine at the Regency Square Properties Total Energy Plant. During the test period, the engines were operating at maximum rated capacity and were being fired with natural gas; the primary fuel for the engines. The report of these emission measurements was reviewed by Duval County Bio-Environmental Services and approved.

The results of the nitrogen oxides emission measurements are summarized in Table 1. Also summarized in Table 1 are the other source parameters required for air quality modeling. It should be noted that the nitrogen oxides emissions reported in Table 1 are reported as nitrogen dioxide ( $NO_2$ ). During the time the emission measurements were conducted, however, it was determined that over 90 percent of the nitrogen oxides emitted from the engines were nitric oxide (NO).

The air quality modeling to evaluate the annual impact of the nitrogen oxides emissions was conducted with the ISC-long term model. This model used as input the emission data and source parameters defined in Table 1, a summary of meteorological data from Jacksonville for the period 1970 through 1974 (in STAR format) and a receptor grid defined to include the area of maximum nitrogen oxides impact. The receptor grid was defined as a 2.8 kilometer square grid with grid points located at 0.2 kilometer intervals (225 total receptors). The Regency Square Properties Total Energy Plant was located in the center of the receptor grid.

The results of the modeling are summarized in Figure 1. The results of the modeling show that the maximum annual impact of nitrogen oxides emissions from the Total Energy Plant is 17.8 micrograms per cubic meter. This impact compares with the annual air quality standard for nitrogen oxides 100 micrograms per cubic meter and a significant impact level for nitrogen oxides for the annual period of 14 micrograms per cubic meter. The significant impact level is defined by state and federal PSD regulations and is reported here only as a point of reference. From Figure 1, it can be determined that the nitrogen oxides impact drops below the significant impact level within 1.0 kilometer of the source.

Based on this air quality review, it can be concluded that nitrogen oxides emissions from the Regency Square Properties Total Energy Plant, with all permitted generating units operating at 100 percent rated capacity and operating 8760 hours per year, will result in a maximum impact which is less than 18 percent of the applicable air quality standard. It can further be concluded that the area of significant impact of the nitrogen oxides emissions does not extend beyond 1.0 kilometers from the source. The impact of nitrogen oxides emissions from the Total Energy Plant is well below levels that would be expected to have an adverse effect on human health and welfare.

If you have any questions regarding the information contained herein, please do not hesitate to contact me.

Very truly yours,

SHOLTES & KOOGLER ENVIRONMENTAL CONSULTANTS

John B. Koogler, Ph.D., P.E.

JBK:1dh Enclosures

# **BEST AVAILABLE COPY**

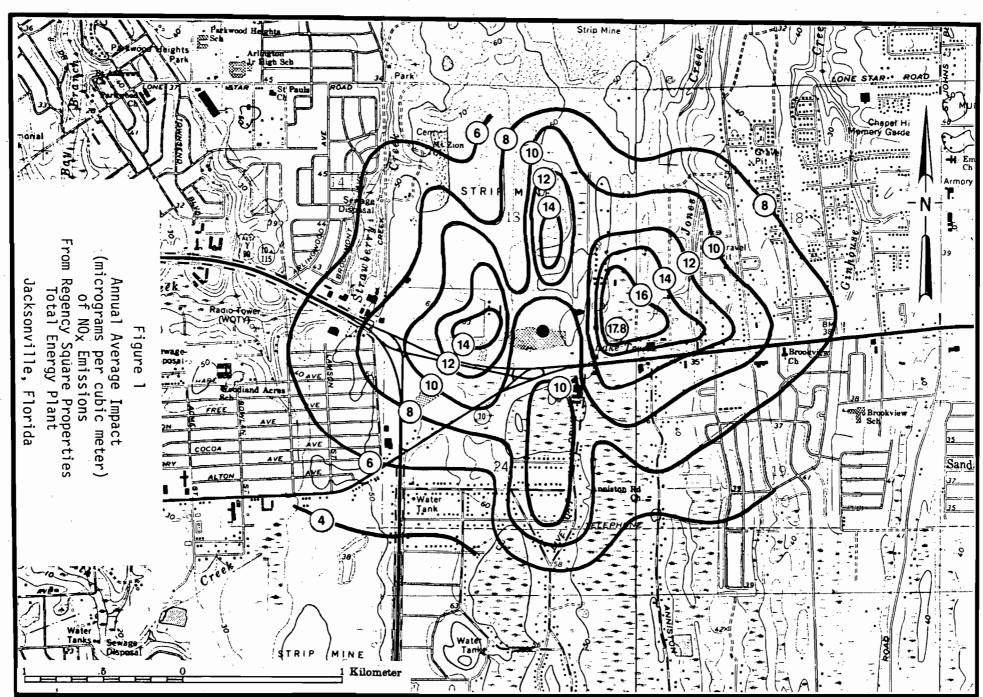


TABLE 1  ${\rm NO}_{\rm X}$  EMISSION DATA AND SOURCE PARAMETERS

# Regency Square Properties Total Energy Plant

Jacksonville, Florida

		Sta	ck	Stack	Gas
Engine 	NO <sub>X</sub> Emissions* (g/sec)	Ht (m)	Dia (m)	Vel (m/s)	Temp (°k)
Worthington 1	1.71	12.8	0.46	18.73	444
2	2.85	12.8	0.46	20.04	472
3 .	4.99	12.8	0.46	19.18	477
4	1.36	12.8	0.46	27.72	753
6	3.49	12.8	0.61	16.63	527
Caterpillar 9 Engines	0.16**	12.8	0.22	23.50	597

<sup>\*</sup> Emissions as NO $_2$  resulting from gas firing; NO/NO $_2$  ratio ranged from 11.7 to 11.9 for Worthington Engines and was 10.0 for the Caterpillar Engines

<sup>\*\*</sup> Total emissions for 9 identical engines

APPENDIX A-4-2

Air Quality Modeling Results

Regency Square TEP Units No. 5 and No. 6

CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07 ACCELERATION OF GRAVITY (METERS/SEC\*\*2) = 9.800

HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) = 10.000

ENTRAINMENT PARAMETER FOR UNSTABLE CONDITIONS = 0.400 ENTRAINMENT PARAMETER FOR STABLE CONDITIONS = 0.600

CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) =

DECAY COEFFICIENT =0.0

1200.00.

PROGRAM OPTION SWITCHES = 1, 1, 1, 0, 0, 3, 2, 2, 3, 2, 2, 0, 0, 0, 0, 0, 0, 0, 1, 0,

ALL SOURCES ARE USED TO FORM SOURCE COMBINATION 1 DISTANCE X AXIS GRID SYSTEM POINTS (METERS )= 1200.00 1400.00, 1600.00, 1800.00,

1600.00.

DISTANCE Y AXIS GRID SYSTEM POINTS (METERS )=

1400.00

0.0 . 2000.00, 0.0 .

2000.00.

200,00, 400.00, 2200.00, 2400.0d, 200.00, 400.00.

2400.00.

2200.00.

600.00, 2600.00, 600.00,

800.00, 1000.00. 2800.00,

800.00, 1000.00,

2600.00, 2800.00,

- AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

1800.00.

STABILITY STABILITY STABILITY STABILITY STABILITY CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6 SEASON 1 298.0000 298.0000 298.0000 298.0000 298.0000

#### - MIXING LAYER HEIGHT (METERS) -

#### SEASON 1

WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6 STABILITY CATEGORY 10.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.10000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.1000000E+040.1000000E+040.1000000E+040.1000000E+040.1000000E+040.1000000E+040.100 STABILITY CATEGORY 20.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040.100000E+040. 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# - ISCLT INPUT DATA (CONT.) -

# - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

## SEASON 1

## STABILITY CATEGORY 1

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
DIRECTION						(12,5000MPS)
(DEGREES)						
0.0	0.00016501	0.00020601	0.0	0.0	0.0	0.0
22.500	0.00014101	0.00013701	0.0	0.0	0.0	0.0
45.000	0.00025702	0.00020601	0.0	0.0	0.0	0.0
67.500	0.00030502	0.00034302	0.0	0.0	0.0	0.0
90.000	0.00049303	0.00061704	0.0	0.0	0.0	0.0
112.500	0.00023701	0.00041102	0.0	0.0	0.0	0.0
135.000	0.00004800	0.00013701	0.0	0.0	0.0	0.0
157.500	0.00028102	0.00027402	0.0	0.0	0.0	0.0
180.000	0.00032902	0.00041102	0.0	0.0	0.0	0.0
202.500	0.00007200	0.00020601	0.0	0.0	0.0	0.0
225,000	0.00019201	0.00054803	0.0	0.0	0.0	0.0
247.500	0.00033302	0.00068504	0.0	0.0	0.0	0.0
270,000	0.00007200	0.00020601	0.0	0.0	0.0	0.0
292,500	0.00021301	0.00034302	0.0	0.0	0.0	0.0
315,000	0.00039802	0.00034302	0.0	0.0	0.0	0.0
337, 500	0.00021501	0.00024001	0.0	0.0	0.0	0.0

#### SEASON 1

## STABILITY CATEGORY 2

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)				:		
0.0	0.00221813	0.00239714	0.00082205	0.0	0.0	0.0
22.500	0.00082705	0.00109607	0.00089105	0.0	0.0	0.0
45.000	0.00058003	0.00095906	0.00109607	0.0	0.0	0.0
67,500	0.00096306	0.00157509	0.00123307	0.0	0.0	0.0
90.000	0.00068804	0.00246515	0.00178111	0.0	0.0	0.0
112.500	0.00062204	0.00130108	0.00137008	0.0	0.0	0.0
135.000	0.00127008	0.00219113	0.00143809	0.0	0.0	0.0
157.500	0.00042603	0.00095906	0.00089105	0.0	0.0	0.0
180.000	0.00137208	0.00239714	0.00150709	0.0	0.0	0.0
202.500	0.00086905	0.00143809	0.00089105	0.0	0.0	0.0
225.000	0.00176511	0.00246515	0.00226014	0.0	0.0	0.0
247.500	0.00127708	0.00287617	0.00191811	0.0	0.0	0.0
270.000	0.00171310	0.00267116	0.00239714	0.0	0.0	0.0
292.500	0.00104706	0.00226014	0.00123307	0.0	0.0	0.0
315.000	0.00140608	0.00267116	0.00130108	0.0	0.0	0.0
337.500	0.00117707	0.00143809	0.00089105	0.0	0.0	0.0

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## - ISCLT INPUT DATA (CONT.) -

## - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

## STABILITY CATEGORY 3

	WIND SPEED					
	. CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)		•				
0.0	0.00122407	0.00273916	0.00328720	0.00013701	0.0	0.0
22.500	0.00058403	0.00143809	0.00212313	0.00048003	0.0	0.0
45.000	0.00064004	0.00130108	0.00390323	0.00048003	0.0	0.0
67.500	0.00052803	0.00157509	0.00636838	0.00178111	0.0	0.0
90.000	.0.00036102	0.00109607	0.00917555	0.00280817	0.00006900	0.0
112.500	0.00024301	0.00089105	0.00616237	0.00191811	0.0	0.0
135,000	0.00062204	0.00164410	0.00554633	0.00171210	0.0	0.0
157,500	. 0.00087105	0.00123307	0.00239714	0.00034302	0.0	0.0
180,000	0.00121807	0.00226014	0.00417725	0.00061704	0.0	0.0
202.500	0.00072704	0.00178111	0.00397124	0.00089105	0.00006900	0.0
225,000	0.00102506	0.00253415	0.00506730	0.00116407	0.00013701	0.0
247.500	0.00106306	0.00273916	0.00787447	0.00123307	0.0	0.0
270.000	0.00099406	0.00369822	0.00739544	0.00191811	0.00020601	0.0
<b>292.5</b> 00	0.00089505	0.00137008	0.00356121	0.00095906	0.00006900	0.0
315.000	0.00107506	0.00191811	0.00404024	0.00061704	0.0	0.00006900
337.500	0.00074004	0.00095906	0.00219113	0.00020601	0.0	0.0

#### SEASON 1

## STABILITY CATEGORY 4

	WIND SPEED					
	CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
DIRECTION	( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
(DEGREES)						
0.0	0.00254215	0.00520431	0.01225673	0.00465628	0.00013701	0.00006900
22.500	0.00080605	0.00287617	0.00746345	0.00835350	0.00054803	0.00013701
45.000	0.00070204	0.00328720	0.00924356	0.01561194	0.00226014	0.00027402
67, 500	0.00094006	0.00335520	0.00944957	0.01246174	0.00109607	0.0
90.000	0.00127708	0.00424526	0.01027061	0.01253075	0.00068504	0.0
112.500	0.00062804	0.00267116	0.00773746	0.00773746	0.00027402	0.00013701
135,000	0.00070704	0.00205412	0.00896954	0.01075064	0.00061704	0.00013701
157.500	0.00078905	0.00273916	0.00636838	0.00424526	0.00054803	0.00006900
180.000	0.00157309	0.00479329	0.01218773	0.00746345	0.00054803	0.0
202.500	0.00096706	0.00294418	0.00876452	0.00554633	0.00034302	0.0
225,000	0.00095406	0.00410825	0.01300978	0.01006560	0.00116407	0.0
247.500	0.00100006	0.00321819	0.00896954	0.00938056	0.00102706	0.00020601
270.000	0.00114007	0.00438226	0.00801148	0.01225673	0.00260216	0.00054803
292.500	0.00114507	0.00315019	0.00410825	0.00835350	0.00232814	0.00027402
315.000	0.00101906	0.00273916	0.00602536	0.00753245	0.00171210	0.00006900
337.500	0.00093506	0.00267116	0.00513531	0.00410825	0.00020601	0.0

- ISCLT INPUT DATA (CONT.) -

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

#### SEASON 1

#### STABILITY CATEGORY 5

WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED	WIND SPEED
CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5	CATEGORY 6
( 0.7500MPS)	( 2.5000MPS)	( 4.3000MPS)	( 6.8000MPS)	( 9.5000MPS)	(12.5000MPS)
0.01462888	0.01485789	0.00479329	0.0	0.0	0.0
0.00481729	0.00513531	0.00109607	0.0	0.0	0.0
0.00607736	0.00691541	0.00130108	0.0	0.0	0.0
0.00861451	0.01211973	0.00171210	0.0	0.0	0.0
0.00756145	0.01040762	0.00356121	0.0	0.0	0.0
0.00680641	0.00849051	0.00451927	0.0	0.0	0.0
0.00873252	0.01246174	0.00499830	0.0	0.0	0.0
0.00753645	0.00766946	0.00239714	0.0	0.0	0.0
0.01490989	0.01780207	0.00335520	0.0	0.0	0.0
0.01010360	0.01376282	0.00198612	0.0	0.0	0.0
0.01261776	0.01650199	0.00376623	0.0	0.0	0.0
0.01240174	0.01561194	0.00616237	0.0	0.0	0.0
0.01757006	0.01643299	0.00609437	0.0	0.0	0.0
0.01485389	0.01177670	0.00356121	0.0	0.0	0.0
0.01118667	0.01129768	0.00404024	0.0	0.0	0.0
0.00947656	0.00821649	0.00321819	0.0	0.0	0.0
	CATEGORY 1 (0.7500MPS) 0.01462688 0.00481729 0.00607736 0.00861451 0.00756145 0.00873252 0.00753645 0.01490989 0.01010360 0.01261776 0.01240174 0.01757006 0.01485389 0.01118667	CATEGORY 1 CATEGORY 2 ( 0.7500MPS) ( 2.5000MPS) ( 0.7500MPS) ( 2.5000MPS) ( 0.01485789	CATEGORY 1 CATEGORY 2 CATEGORY 3 (0.7500MPS)(2.5000MPS)(4.3000MPS)  0.01462688 0.01485769 0.00479329 0.00481729 0.00513531 0.00109607 0.00607736 0.00691541 0.00130108 0.00541541 0.01211973 0.00171210 0.00756145 0.01040762 0.00356121 0.00480641 0.00849051 0.00451927 0.00873252 0.01246174 0.00499830 0.00753645 0.00766946 0.00239714 0.01490989 0.01780207 0.00335520 0.01010360 0.01376282 0.00198612 0.01261776 0.01650199 0.00376623 0.01240174 0.01561194 0.00616237 0.01485389 0.01177670 0.00356121 0.01118667 0.01129768 0.00404024	CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 ( 0.7500MPS) ( 2.5000MPS) ( 4.3000MPS) ( 6.8000MPS) ( 0.07500MPS) ( 2.5000MPS) ( 4.3000MPS) ( 6.8000MPS)	CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 (0.7500MPS) (2.5000MPS) (4.3000MPS) (6.8000MPS) (9.5000MPS) (0.7500MPS) (0.7500MPS) (0.7500MPS) (0.7500MPS) (0.7500MPS) (0.00479329 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.

#### - VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED WIND SPEED CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6 STABILITY CATEGORY 10.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 20.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 30.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 40.0 0.0 0.0 0.0 0.0 0.0 STABILITY CATEGORY 50.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.200000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.20000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-010.2000E-0

#### - WIND PROFILE POWER LAW EXPONENTS -

WIND SPEED WIND SPEED

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###### PAGE \*\*\*\* ISCLT \*\*\*\*\*\*\* Resency Sq. - TEP NOX Emissions - Blds Wake Effect Included - SOURCE INPUT DATA -C T SOURCE SOURCE EMISSION BASE / - SOURCE DETAILS DEPENDING ON TYPE -A A NUMBER TYPE COORDINATE COORDINATE HEIGHT ELEV- / RP (H) ATION / (H) DΕ (H) / 0.0 GAS EXIT TEMP (DEG K)= 753.00, GAS EXIT VEL. (M/SEC)= 21.40, 5 STACK 1450.00 1450.00 17.30 STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( UNAMS PER SEC SEASON 1 SEASON 2 SEASON 3 5.74000E+00 1400.00. 1400.00 IS LEGO THAN PERMITTED WARNING - DISTANCE BETWEEN SOURCE 5 AND POINT X,Y= 1450.00 17.30 0.0 GAS EXIT TEMP (DEG K)= 753.00, GAS EXIT VEL. (M/SEC)= 17.10, 6 STACK 1450.00 STACK DIAMETER (M)= 0.610, HEIGHT OF ASSO. BLDG. (M)= 8.20, WIDTH OF ASSO. BLDG. (M) = 150.00, WAKE EFFECTS FLAG = 1 - SOURCE STRENGTHS ( UHAMS PER SEC SEASON 1 SEASON 2 SEASON 3 SEASON 4 4.59000E+00 1400.00 IS LEGS THAN PERMITTED WARNING - DISTANCE BETWEEN SOURCE 6 AND POINT X,Y= 1400.00,

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	.960141	4.654199	5.112777	4.767076	4.438409	4.125918			
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	.472760	5.240659	5.422725	5.232121	4.895541	4.583902			
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	. 160921	5.076097	5.595911	5.560935	5.280249	4.948410			
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\*\*\*\* ISCLT \*\*\*\*\*\*\*\* Resency Sq. - TEP NOX Emissions - Bldg Wake Effect Included

ANNUAL GROUND LEVEL CONCENTRATION ( MICROGRAMS PER CUBIC METER ) FROM ALL SOURCES COMBINED (CONT.) \*\*

- PROGRAM DETERMINED MAXIMUM 10 VALUES -

COORDINATE	COORDINATE	
(METERS)	(METERS )	
2200.00	1600.00	5.652878
2200.00	1400.00	5.595911
2400.00	1400.00	5.560935
2400.00	1600.00	5.549187
2200.00	1800.00	5.422725

1800.00 2000.00

2000.00 2600.00

2000.00

2200.00

2000.00

1600.00 5.274210 2000.00 5.242806 1800.00 5.240659

CONCENTRATION

5.372938 5.280249

5.0 IMPACT ON SOILS, VEGETATION AND VISIBILITY AND SECONDARY IMPACTS
The land use within five kilometers of the Regency Square TEP is primarily commercial and/or residential. There are no agricultural or horticultural crops of commercial significance grown in the area and there are no hospitals, convalescence homes or nursing homes in the area which might contain an ultra-sensative population of persons.

In view of the land use in the vicinity of the Regency Square TEP, the fact that the impact of emissions from the proposed generating Unit No. 5 are only 22 percent of the significant impact level for nitrogen oxides and the fact that the maximum expected ground-level concentration in the area is 39.0 micrograms per cubic meter or 39 percent of the air quality standard for nitrogen oxides, it can be concluded that the emissions from the proposed source will not have a significant impact on soils, vegetation or visibility.

The operation of the proposed generating unit will not increase employment at the Regency Square TEP nor will it increase traffic either at the TEP, shopping center owned by Regency Square Properties or the office complex owned by Regency Square Properties. The expansion of the shopping center which necessitated the installation of the proposed generating unit was covered, in 1979, under the complex source permitting procedure. In view of these facts it can be concluded that there are no significant secondary impacts that will result from the installation or operation of the proposed source.

DEPARTMENT OF HEALTH, WELFARE & BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services Division
Air and Water Pollution Control

August 26, 1982



Mr. Robert Gillander Regency Square Properties Barnett Regency Tower Suite 1200 Jacksonville, Florida 32211

Re: #5 Worthington Generator

Dear Mr. Gillander:

On August 25, 1982 I discovered that the #5 Worthington Generator at your facility is currently being installed and reassembled. Since the #5 unit is considered a new source, an air pollution Construction Permit is required prior to construction according to Chapter 17-2 Florida Administrative Code (FAC). In order to apply for the required permit, please submit the following information to this Agency on or before September 15, 1982:

- (1) Completed permit application (application enclosed).
- (2) Application fee payable to the Florida Department of Environmental Regulation (Please determine appropriate fee from attached fee schedule).

If I can be of further assistance in this matter, please advise.

Very truly yours,

Jerry E. Woosley Assistant Engineer

JEW/vj Enclosures

cc: Robert Sholtes, Ph.D., P.E. (Sholtes & Koogler) - with enclosure

c: Mr. Clair Fancy, DER - with enclosure



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

# INTEROFFICE MEMORANDUM

And/Or To	Outing To District Offices Other Than The Address	<b>~</b>
To Lace	Loctn.	
To	Loctr -	
To:	Locto.:	<u> </u>
From:	Date	<u></u>
Reply Optional (	Reply Required ( )	into. Only ( )
Date Due:	Date Due:	

TO:

District/Subdistrict Managers

Suzanne Walker Steve Smallwood

FROM:

Bill Buzick

DATE:

June 25, 1982

SUBJECT: Fee Schedule; General Permits

The attached are new rules and amendments adopted by the Secretary June 15 and filed with the Secretary of State June 18, 1982. They are effective July 8, 1982.

## FEE SCHEDULE (17-4.05)

All applications filed on July 8 or subsequent to that date are to be charged the fees listed here. Applications which contain requests for construction and operation permits are to be charged fees for each type of permit (except for an application in which stormwater is considered as a part of some other type of permit). For example, a domestic wastewater treatment plant with disposal to injection well would pay both the fee for the plant and the fee for the injection well. Another example, an operation permit was issued in 1977 for several air sources in one permit; when it is renewed, the fees would be the total of each separate source although you may continue to issue one permit to the permittee. If there are any doubts as to the appropriate fee to charge because of a unique situation or for any reason, call Helen Setchfield. It is imperative that we implement the new fee system consistently because of the stringent audit reviews associated with the new Permit Fee Trust Fund.

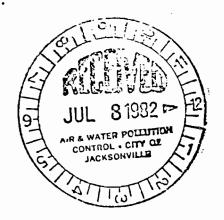
## GENERAL PERMITS (17-4.51 - 17-4.63)

Notices to use a general permit will not be processed and reviewed. Only collection/Distribution Systems have a notice form, I recognize it will be necessary to read the application to determine if it is a request to use a general permit. This should take no more than a few minutes. No written response should be given unless it is to tell the individual that he does not qualify. The basic information should be entered in the computer programs by the appropriate staff. They will be logged in PATS as exemptions, and in GPSI or MSIS as appropriate.

WLB/hs

## Attachments

cc: Terry Cole
Steve Fox
Larry Lukin
Howard Rhodes
Don Mills
Fran Steverson
Mary Clark



tdt When the applicant is a person acting as a public officer employed by the State; a county; or a municipality; or other governmental unit of the State; only on work where the total estimated cost is less than \$10,7000;

fe+ in any other situation where professional engineering is
not required by Chapter 471, F.S.

- (4) Each application for a permit shall be accompanied by a processing fee, except for applications filed by departments of the executive branch established pursuant to Chapter 20, F.S., and water management districts established pursuant to Chapter 373, F.S. The check shall be made payable to the Department of Environmental Regulation. The processing fee is non-refundable except as provided for in Section 120.60, F.S, and in this section. Processing fees are as follows:
  - (a) Air Pollution Source Permits
- 1. Construction Permit for a source having potential
  emissions of more than 100 tons per year of any single
  pollutant
  \$1000
- 2. Construction Permit for a source having potential
  emissions of more than 75 tons per year of any single
  pollutant

  \$750
- 3. Construction Permit for a source having potential
  emissions of more than 50 tons per year of any single
  pollutant

  \$500
- 4. Construction Permit for a source having potential

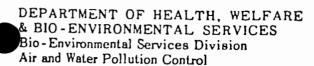
  emissions of more than 25 tons per year of any single

  pollutant

  \$250
- 5. Construction Permit for a source having potential
  emissions of less than 25 tons per year of any single
  pollutant
  \$100
  - 6. Operation Permit for a source required to stack

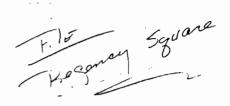
Adopted 6/18/82 Effective 7/8/82

CODING: Words underlined are additions; words in struck through type are deletions from existing law.



December 18, 1981

Mr. Robert Gillander Regency Square Properties Barnett Regency Tower Suite 1200 Jacksonville, Florida 32211





Re: Permit A016-45674

Dear Mr. Gillander:

As a result of the meeting with Sholtes & Koogler Inc. (Regency Square Properties consultants), the Department of Environmental Regulation representatives and this agency on December 8, 1981 in Tallahassee, Florida, the following actions were agreed upon:

- Regency Square Properties will perform emission tests on Worthington Generators 1,2,3,4 and 6 for total hydrocarbons, nitrogen oxides and visible emissions.
- 2. Regency Square Properties will perform emission tests on one representative Caterpillar engine for total hydrocarbons and nitrogen oxides.
- 3. Prior to the emission tests, Regency Square Properties will have a pretest conference with Bio-Environmental Services representatives.
- 4. Regency Square Properties will have computer modelling performed to determine the ambient air concentrations of Nitrogen oxides while operating Worthington Generators 1,2, 3,4, and 6 at maximum load, 8760 hours per year. Emission data for the computer modelling will be taken from the test results obtained under item 1 and 2 above which must have been accepted by Bio-Environmental Services prior to the computer modelling.
- 5. Visible emission tests performed under item 1 will be considered in establishing visible emission limiting standards for Worthington Generators 1,2,3,4, and 6.
- 6. Visible emission limits for the Caterpillar engines will remain at 5% opacity.

- 7. Visible emission limits for the Worthington Generators while burning 100% diesel fuel will be 20% opacity.
- 8. All emission tests, test results, and computer modelling will be submitted to BES for review in determining revised operating permit conditions for permit A016-45674.
- 9. The #6 Worthington Generator will be treated as a replacement for the #5 Worthington Generator.
- 10. The #5 Worthington Generator is considered a new unit and is subject to all local, state, and federal reviews and permitting requirements prior to initiation of reassembly.
- 11. The current permit conditions for A016-45674 are effective until revised.

It is requested that all emission tests be performed on or before January 8, 1982.

If you have any questions concerning this matter please advise.

Very truly yours,

Jerry E. Woosley Assistant Engineer

JEW/vj

cc: D. Dutton - DER

cc: C. Fancy - DER (Tallahassee)

- (32) "Coating" The application of a protective film to a surface.
- (33) "Coating Application System" Any operations and equipment which apply, convey, and dry a surface coating, including, but not limited to, spray booths, flow coaters, conveyors, flashoff areas, air dryers and ovens.
- (34) "Coating Applicator" An apparatus used to apply a surface coating to a surface.
- (35) "Coating Line" One or more apparatus or operations which include a coating applicator, flash-off area, and oven wherein a surface coating is applied, dried, and/or cured.
- (36) "Coil Coating" The coating of any flat metal sheet or strip that comes in rolls or coils.
- (37) "Cold Cleaning" The batch process of cleaning and removing soils from metal surfaces by brushing, flushing, or immersion while maintaining the solvent below its boiling point. Wipe cleaning is not included in this definition.
- (38) "Cold Mixed Asphaltic Concrete Patching Material" A mixture of asphalt cement, stone aggregate, and mineral filler blended together with a small amount of petroleum solvent (diluent). The diluent prevents the material from hardening after the heat of mixing has dissipated, thereby allowing stockpile storage of the material for use in pavement repairs when the use of hot asphaltic concrete is impractical.
- (39) "Commence Construction" As applied to the construction or modification of a facility, means that the owner has all preconstruction permits and approvals required under federal air pollution control laws and regulations which are part of the State Implementation Plan (SIP) or which are part of Chapter 17-2 to the extent that the provisions of this chapter specify conditions or requirements for obtaining a state construction permit for an air pollution source, and has:
- (a) Begun, or caused to begin, a continuous program of actual on-site construction or physical modification of the facility, to be completed within a reasonable time; or
- (b) Entered into binding agreements or contractual obligations, which cannot be cancelled or modified without substantial loss to the owner or operator, to undertake a program of actual construction or physical modification of the facility to be completed within a reasonable time; or
- (c) Begun, or caused to begin, those on-site activities, other than preparatory activities, which mark the initiation of a change in the method of operation of the facility.
- (40) "Complete" In reference to an application for a permit, means that the application contains all of the information necessary for processing the application.
- (41) "Condensate" Hydrocarbon liquid separated from natural gas which condenses due to changes in the temperature and/or pressure and remains liquid at standard conditions.
  - (42) "Construction" The act of performing on-site

fabrication, erection, installation or modification of a source or facility of a permanent nature, including, but not limited to installation of foundations or building supports, laying of underground pipe work or electrical conduit; and fabrication or installation of permanent storage structures, component parts of a source or facility, associated support equipment, or utility connections. Land clearing and other site preparation activities are not part of the construction activities.

- (43) "Continuous Monitoring System" All equipment, required under Section 17-2.710, used to calibrate, sample, condition (if applicable), and analyze air emissions, or used to provide a permanent record of emissions or process parameters.
- (44) "Conveyorized Degreasing" The continuous process of cleaning and removing soils from metal surfaces by operating with either cold or vaporized solvents.
- (45) "Crude Oil" A naturally occurring mixture which consists of hydrocarbons and/or sulfur, nitrogen and/or oxygen derivatives of hydrocarbons and which is a liquid at standard conditions.
- (46) "Cutback Asphalt" Asphalt cement which has been liquefied by blending with petroleum solvents (diluents). Upon exposure to atmospheric conditions the diluents evaporate, leaving the asphalt cement to perform its function.
- (47) "Delivery Vessel" Tank trucks or trailers equipped with a storage tank and used for the transport of gasoline from sources of supply to stationary storage tanks of gasoline dispensing facilities.
- (48) "Department" The State of Florida Department of Environmental Regulation.
- (49) "Dry Cleaning Facility" A facility engaged in the cleaning of fabrics in an nonaqueous solvent by means of one or more washes in solvent, extraction of excess solvent by spinning, and drying by tumbling in an airstream. The facility includes but is not limited to: washer, dryer, filter and purification systems; waste disposal systems; holding tanks; pumps and attendant piping and valves.
- (50) "Emission Limiting Standard" or "Emission Standard" or "Emission Limitation" or "Performance Standard" Any restriction established in or pursuant to a regulation adopted by the Department on the quantity, rates, concentration or opacity of any pollutants which are released, allowed to escape or emitted, whether intentionally or unintentionally, into the atmosphere.
- (51) "Emission Offset" or "Offset" A compensating reduction in the emissions of an affected pollutant from a permitted source to provide an emission allowance for a new or modified source.
- (52) "Emission Point" or "Discharge Point" The point at which an air pollutant first enters the atmosphere.
- (53) "Emulsified Asphalt" An emulsion of asphalt cement and water which contains a small amount of an emulsifying agent; a heterogeneous system containing two normally immiscible