CITY OF TAMPA

MEMORANDUM

DATE: March 27, 2000

TO: BRIAN BEALS, EPA
CLAIR FANCY, DEP
MARY JEAN YON, DEP
BOB BUTERA, DEP
JERRY CAMPBELL, EPC
PAUL SCHIPFER, EPC
DAVID DEE, Landers and Parsons

FROM: GREIG GROTECLOSS, City of Tampa

SUBJECT: McKay Bay Refuse-to-Energy Facility

The quarterly progress report for the Clean Air Act retrofit of the McKay Bay Refuse-to-Energy Facility is attached. This is submitted in accordance with the dioxin agreement, the ash building variance and the yard waste variance.

Please call me at (813) 242-5408 if you have any questions or would like additional information.

McKay Bay Refuse-to-Energy Facility
Clean Air Act Retrofit Status Report

Actions Taken Last Quarter (1Q00)

Completed construction of new stack and all 4 flues.

Completed installation of the boiler support steel for units 3 and 4.

Completed construction of the floor and concrete bunker walls of the ash building.

Began installation of the support steel for the ash building roof and sidewalls.

Began construction of a new tipping floor of 12 inch thick concrete.

Completed installation of the grates in units 3 & 4.

Began erecting the waterwall sections of the boilers for units 3 & 4.

Completed erecting the support steel and shells of the scrubbers and fabric filters for units 3 & 4.

Completed installation of the gas line for the auxiliary burners.

Began installation of new control system.

Continued diverting half of the City's waste to the Southeast County Landfill.

Actions Planned For Next Quarter (2Q00)

Continue mechanical erection of units 3 and 4 (boilers, scrubbers and fabric filters).

Continue construction of ash building and ash handling systems.

Begin refuse crane repairs.

Continue installation of new distributed control system.

Continue construction of new 12 inch concrete pavement in the tipping building.

Begin reconstruction of the tipping building

Begin systems startup of units 3 & 4 for demonstration testing.

CITY OF TAMPA
MEMORANDUM

RECEIVED
FEB 01 2000
BUREAU OF AIR REGULATION

DATE: January 25, 2000

TO: BRIAN BEALS, EPA
CLAIR FANCY, DEP
MARY JEAN YON, DEP
BOB BUTERA, DEP
JERRY CAMPBELL, EPC
PAUL SCHIPFER, EPC
DAVID DEE, Landers and Parsons

FROM: GREIG GROTECLOSS, City of Tampa

SUBJECT: McKay Bay Refuse-to-Energy Facility

The quarterly progress report for the Clean Air Act retrofit of the McKay Bay Refuse-to-Energy Facility is attached. This is submitted in accordance with the dioxin agreement, the ash building variance and the yard waste variance.

Please call me at (813) 242-5408 if you have any questions or would like additional information.

McKay Bay Refuse-to-Energy Facility
Clean Air Act Retrofit Status Report

Actions Taken Last Quarter (4Q99)

- Completed pile driving and foundations for units 3 and 4, the stack and the ash building.
- Began installation of the boiler support steel for units 3 and 4.
- Began erection of the ash building walls.
- Completed concrete repairs to the waste storage pit in front of units 3 and 4.
- Completed stack testing on units 3 and 4.
- Completed installation of the majority of the new storm water management system.
- Continued diverting half of the City's waste to the Southeast County Landfill.
- Began erection of stack shell.

Actions Planned For Next Quarter (1Q00)

- Complete stack shell and install flues.
- Continue mechanical erection of units 3 and 4 (boilers, scrubbers and fabric filters).
- Continue construction of ash building and ash handling systems.
- Begin refuse crane repairs.
- Begin installation of new distributed control system.

File

Memorandum

Florida Department of Environmental Protection

To: Noel Morera
Hillsborough County EPC

From: Joseph Kahn, P.E.
New Source Review Section

Date: October 13, 1999

Re: McKay Bay New Stack Location

I reviewed your memo of October 5, 1999 to Clair Fancy regarding dioxin emission modeling for the McKay Bay facility and believe that the revised modeled concentration is not cause for concern. One of our meteorologists reviewed the modeling information provided by CDM in its letter dated August 30th and believes that the modeling appears to be satisfactory. The new modeled maximum annual dioxin impact of 1.70E-07 $\mu g/m^3$ is not significantly different from the original modeled value of 1.61E-07 $\mu g/m^3$, and the emission rate is unchanged.

We thoroughly reviewed the construction permit application and determined that the project will comply with 40 CFR 60 Subpart Cb, and we issued the construction permit on that basis. This federal standard constitutes Maximum Achievable Control Technology for this facility for dioxin as well as other air pollutants. Our understanding is that after completion of construction, emissions of dioxins will be reduced dramatically compared to recent testing of the current combustion units.

Because relocating the proposed stack prior to construction does not constitute a physical change, and neither the emission rates nor control equipment are proposed to be changed, the stack relocation does not constitute a modification of the permit. We agree that the facility must demonstrate compliance with its permitted emission rates for dioxin and other air pollutants after construction is completed, and this is required by the construction permit conditions.

Please call me at 850/921-9519 if you have any questions.

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530
WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788
WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

ENVIRONMENTAL PROTECTION COMMISSION
of Hillsborough County

FAX Transmittal Sheet

ATE: 10-6-99

O: Mr. Clair Fancy, PE

FAX Phone: c Voice Phone: 850/488-1344

OTAL NUMBER OF PAGES INCLUDING THIS COVER PAGE: 2

PC FAX Transmission Line: (813) 272-5605
For retransmission or any FAX problems, call: (813) 272-5530

ROM: Noel Morera
(Circle applicable section below)

Air Division

-Compliance -Enforcement/Analysis

-Monitoring/Toxics -Permitting

PECIAL INSTRUCTIONS:

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
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WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

M E M O R A N D U M

DATE: October 5, 1999

TO: Mr. Clair Fancy, P.E.

FROM: Noel Morera NM. THRU: Richard C. Kirby, IV, P.E. RK
Jerry Campbell, P.E.
Leroy Shelton

SUBJECT: Mckay Bay Refuse to Energy Facility - Modeling of new Stack Location

On August 31, 1999, the Environmental Protection Commission of Hillsborough County (EPC) received a copy of a letter from Camp Dresser & McKee Inc. (CDM) to you containing the revised stack location modeling for Mckay Bay's new stack location. During our review of this letter, dated August 30, 1999, it was noted that the annual modeled dioxin concentration in table 6-8 was 1.70E-07 ug/m^3, which is higher than the old FDEP ambient reference concentration (ARC) of 2.20E-08 ug/m^3 for 2,3,7,8-TCDD. However, in table 6-10, CDM adjusted the FDEP ARC for total dioxins and furans to 1.21E-06 ug/m^3 (see note 1 on table 6-10), a lower value than modeled. While the dioxin emission standard is based on the total mass of dioxin and furans, we are unable to verify the conversion factor used by this consultant.

Currently there is no permissible exposure level (PEL) listed for dioxin that the results of this modeling can be compared to. The lack of a PEL standard leads us to question if the 1.70E-07 ug/m^3 concentration is something we should be concerned about? EPC would like to know if it would be possible to have the State toxicologist look at the potential health effects of this level of exposure to dioxin. An alternative would be for the City of Tampa to update its 1996 Dioxin Risk Assessment for the Mckay Bay facility to reflect the new air pollution control equipment. At a minimum, it is imperative that the dioxin emissions measured during the required initial new stack test be compared against the modeled emission rate, which apparently was based on the maximum permitted emission rate of 30 ng/dscm.

We look forward to hearing from you.

Cc: Bill Thomas

LANDERS & PARSONS, P.A.
ATTORNEYS AT LAW

DAVID S. DEE
JOSEPH W. LANDERS, JR.
JOHN T. LaVIA, III
FRED A. McCORMACK
PHILIP S. PARSONS
ROBERT SCHEFFEL WRIGHT

HOWELL L. FERGUSON
OF COUNSEL

VICTORIA J. TSCHINKEL
SENIOR CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

MAILING ADDRESS:
POST OFFICE BOX 271
TALLAHASSEE, FL 32302-0271

310 WEST COLLEGE AVENUE
TALLAHASSEE, FL 32301

TELEPHONE (850) 681-0311
TELECOPY (850) 224-5595
www.landersandparsons.com

October 5, 1999

Mr. Scott Davis
United States Environmental Protection Agency
Region 4
Air & Radiation Technology Branch
61 Forsyth Street
Atlanta, Georgia 30303

Re: Dioxin Testing for Tampa's McKay Bay Facility

Dear Mr. Davis:

On behalf of the City of Tampa, I am sending you this letter to confirm and supplement the information I provided to you during our recent telephone conversations.

Since 1995 the City of Tampa has worked with the United States Environmental Protection Agency (EPA) to evaluate the potential dioxin emissions from the City's McKay Bay Refuse-to-Energy Facility (Facility), in accordance with the City's informal agreement with EPA. Among other things, City hired a consultant to perform an independent health risk assessment (HRA) concerning the Facility's dioxin emissions. The HRA demonstrated that the potential risks associated with the Facility's emissions would be below the levels that would be a regulatory concern. After the HRA was prepared, the City continued to conduct routine stack tests, which have confirmed that the Facility's emissions typically have been substantially less than the levels that were used for the analyses in the HRA.

In July 1999, two of the Facility's four municipal waste combustor (MWC) units were shut down and construction commenced on various Facility improvements. These two MWC units will not recommence operations until they have been equipped with new air pollution control systems. At that time, the units will be able to operate in compliance with the low emission limits for dioxin that are set forth in 40 C.F.R. 60, Subpart Cb.

Only two of the Facility's four MWC units currently are operating. It is anticipated that these two remaining MWC units will be taken out of operation in November, 2000. New air pollution control systems will be installed on these units before they resume operations.

In light of these facts, the City of Tampa believes it is not necessary to conduct further dioxin tests on the two MWC units that currently are in operation at the Facility. The City already has collected a significant amount of data concerning the Facility's dioxin emissions. Since two MWC units are no longer in operation, the Facility's emissions presumably are only about one-half of the levels that were evaluated in the HRA. Conducting additional stack tests on the two operational units would be expensive, but would provide little or no useful data because these two units will cease operations in the future.

Accordingly, the City of Tampa respectfully requests EPA to concur in writing that no additional dioxin testing needs to be performed at the Facility at this time. The City will conduct its annual stack tests at the Facility during the week of October 25th, but the City will not test for dioxin unless promptly requested to do so by EPA. Assuming the City's retrofit proceeds as planned, the City does not expect to test for dioxin again until the City completes the retrofit and recommences operations with the new air pollution control systems.

Please feel free to call me at (850) 681-0311 if you have any questions. Thank you for your cooperation and assistance with this matter.

Sincerely,

David S. Dee

DSD/nw
cc: Walt Stevenson
Clair Fancy
Nancy McCann
Mike Salmon
Jerry Campbell

CITY OF TAMPA

Department of Solid Waste
Office of Environmental Coordination

Mr. Jerry Kissel
Department of Environmental Protection
Air Permitting Section
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Re: Permit Number 0570127-002-AC
PSD-FL-086 (A)

Dear Mr. Kissel:

Specific condition B.26 of the above referenced permit requires submittal of furnace and boiler design capacities for the McKay Bay Refuse-to-Energy Facility retrofit. Several drawings and data sheets are attached in response to specific condition B.26. The drawings are not finalized and may be subject to minor changes as the design is completed. I also wish to stress that the data sheets provided are design points and are not submitted as actual operating ranges for the furnace and boiler parameters. The construction permit contains limits on steam flows, charging rates and boiler outlet temperatures. Please review the information and contact me if you have any questions or require additional information. My phone number is (813) 242-5408.

Sincerely,

Greig Grotecloss
Engineer II

cc Rick Kirby, EPC
Don Markley, MPI
Dan Strobridge, CDM
Luke Koon, WMB
A. Linero, FDEP w/4 full size drawings

2.1.2 Technical Proposal/Facility Retrofit/Equipment Specification Data Sheets

COMBUSTION/STEAM GENERATION UNITS

1.	Number of Units:	Four (4)
2.	Type:	Balanced Draft, Water Wall, Natural Cir'
3.	Manufacturer:	DB Riley, Inc.
4.	Maximum Continuous Rating Per Unit (million Btu/hr):	100
	a. Furnace / Boiler Firing Diagram (Design Envelope)	See Von Roll Drawing 2009 G 320 001
	b. Temperature and Residence Time Profile Diagram	See Figures 2.1.2 A & B.
	c. Maximum continuous throughput at Maximum Continuous Rating (lb/hr)	62,186 - Steam 20,833 - Refuse
5.	Stoker or Combustion:	
	a. Type:	Reciprocating Von Roll R-10029
	b. Manufacturer:	Von Roll Inc.
	c. Total GrateArea (sq/ft) (per unit): width 9.5 length 32.7	311
	No 1 Module area :(sq.ft.)	62.2
	No. 2 Module area:(sq.ft.)	62.2
	No. 3 Module area :(sq.ft.)	62.2
	No. 4 Module area :(sq.ft.)	62.2
	No. 5 Module area (sq/ft):(sq.ft.)	62.2
	d. Design Grate Loading (Btu/hr/ft^2):	321,600
	e. Materials of Construction:	Chrom Alloy Steel
	f. Charging Description:	Variable Speed Hydraulic Ram

2.1.2 Technical Proposal/Facility Retrofit/Equipment Specification Data Sheets

g.	Capacity Control Method:	Variable Speed of Ram (Stroke/min.)
h.	Siftings Handling Description:	See Section Article 7.9, Section 2.1.1
I.	Forced Draft Air System Description:	See Section Article 7.4, Section 2.1.1
j.	Overfire Air System Description (Including the percentage of overfire air to total combustion air)	See Article 7.4, Section 2.1.1
k.	Ash Discharger Description, Size:	See Article 7.8, Section 2.1.1
l.	Hydraulic System Description:	See Article 7.10, Section 2.1.1

6. Charging Hopper, Type and Size: Refurbish Existing Hoppers

7. a. Excess Air at MCR with 4,800 Btu/lb Waste (%): 80% Design

8. Average Gas Velocities* and Temperatures @ 4800 Btu/lb:, Excess Air and Normally Fouled Conditions

a.	Furnace Section:	12.2 Ft/sec	1381 °F
b.	Radiant Pass:	11.1 Ft/sec	1095 °F
c.	Superheater Tube Section:	16.6 Ft/sec	1065 °F
d.	Convection Tube Section:	12.4 Ft/sec	846 °F
e.	Convection Pass 1:	13.1 Ft/sec	7 818 °F
f.	Convection Pass 2:	16.3 Ft/sec	785 °F
g.	Convection Pass 3:	15.8/14.2 Ft/sec	746/620 °F
h.	Economizer Tube Section:	12.8 Ft/sec	515 °F
I.	Air Preheater Tube Section:	N/A Ft/sec	N/A °F

*

9. Furnace Volume (cu ft): 11,814 (Radiant Pass 1)

2.1.2 Technical Proposal/Facility Retrofit/Equipment Specification Data Sheets

a. Design Heat Release Rate (Btu/hr/ft^3): 8464.5

10. Steam Output Per Unit at MCR with 4,800 Btu/lb Waste (lb/hr): 62,185

Performance tests and performance calculations, if required, shall be made in accordance with the applicable ASME Test Form for Abbreviated Efficiency Tests in the latest edition of the "Steam Generating Units - Power Test Code" of the American Society of Mechanical Engineers and the measure of performance shall be the results of such tests. Performance calculations shall be based on the ASME Steam Tables published in 1967. Specific performance test procedures to be established by mutual agreement between the Vendor and the Purchaser.

b. Guaranteed Performance

The design of each furnace/boilers shall be nominally based on processing 250 tons per day ("TPD") of Processible Waste, designed to meet the Maximum Continuous Rating ("MCR") of the boiler and having a peak operating capability based on the designed high heating value of the waste fuel. The Facility shall be capable of processing Processible Waste, which varies in composition and heat content. The waste processing capacity range for each of the four (4) processing trains shall, at a minimum, meet the following requirements without the use of auxiliary fuel:

1) Nominal Throughput of 250 TPD

2) MCR at 100 million Btu per hour of heat input from waste fired (firing 250 TPD of waste at a HHV of 4800 Btu/lb)

3) A Peak Operating Capacity of 110 percent of Nominal Throughput while firing 4,800 Btu/lb waste

4) Range of fired-waste HHV: 3800 Btu per pound to 6000 Btu per pound

5) Turn-down capability to 75 percent of nominal heat input

The Vendor guarantees the following items of performance when operating at steady steaming conditions, 650 psig steam outlet pressure, 280°F feedwater, and when burning the 4800 Btu/hr waste fuel under a nominally fouled boiler condition. Specific testing procedures to be established by mutual agreement between DB Riley and Purchaser.

Steam capacity	62,185 lb/hr
Steam temperature at superheater outlet	725 °F +/-10 °F
Steam temperature control range	75 to 110%
Economizer exit gas temperature	435 °F

DEUTSCHE BABCOCK
DB RILEY, INC.

PREDICTED PERFORMANCE SUMMARY
RETROFIT OF FOUR EXISTING UNITS

Name: WAPC FOR: MCKAY BAY
Location: TAMPA, FLORIDA
Unit No.: 1, 2, 3, & 4

Notes: *Based on DBR Drawing No. 500052LPS-04*
Revision: 14-Oct-98
CONTRACT NO.: 500052

CASE:		DESIGN HHV		DESIGN HHV		DESIGN HHV		
BOILER LOAD	% MCR	100.0%		110.0%		75.0%		
STEAM FLOW	lb/hr	62,166		69,217		47,128		
NOTES:	Unit Design	250 TPD		275 TPD		187.5 TPD		
	Fuel HHV	4,800 Btu/lb		4,800 Btu/lb		4,800 Btu/lb		
	Excess Air	80%		70%		90%		
	Load ID	100% MCR		110% MCR		75%		
	Cleanliness	Nom. Foul		Nom. Foul		Nom. Foul		

1 FUEL FLOW

FUEL FLOW RATE - TOTAL	lb/hr	20,834		22,917		15,625		
MSW FLOW RATE	lb/hr	20,834		22,917		15,625		
MSW FLOW RATE	tons/day	250		275		187.5		
NAT. GAS FLOW RATE	lb/hr	0		0		0		

2 WATER & STEAM FLOW RATES

FEEDWATER (into economizer)	lb/hr	60,438		66,807		47,960		
BLOWDOWN	lb/hr	1,036		1,049		999		
STEAM THROUGH PRIM. SH	lb/hr	59,402		65,758		46,961		
AUXILIARY STEAM OUTPUT	lb/hr	0		0		0		
STEAM THROUGH SEC. SH	lb/hr	62,186		69,217		47,128		
SH SPRAY	lb/hr	2,764		3,459		167		

3 WATER / STEAM TEMPERATURES

SPRAY WATER, SUPERHEAT	°F	280		280		280		
FEEDWATER	°F	280		280		280		
ECONOMIZER OUTLET	°F	479		472		478		
DRUM / SATURATION	°F	509		512		504		
FINAL STEAM	°F	725		725		726		

4 WATER / STEAM PRESSURES

FEEDWATER	psia	775		795		726		
ECON DP	*psi*	*35*		*40*		*20*		
DRUM	psia	740		755		706		
SH DP	*psi*	*75*		*90*		*40*		
MAIN STEAM OUTLET	psia	665		665		665		

5 AIR AND FLUE GAS FLOW RATES

COMBUSTION AIR FLOW	lb/hr	130,683		135,732		103,430		
FLUE GAS FLOW FROM COMB.	lb/hr	147,673		154,445		116,200		

DEUTSCHE BABCOCK
DB RILEY, INC.

PREDICTED PERFORMANCE SUMMARY
RETROFIT OF FOUR EXISTING UNITS

Name: WAPC FOR: MCKAY BAY
Location: TAMPA, FLORIDA
Unit No.: 1, 2, 3, & 4

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Revision: 14-Oct-98
CONTRACT NO.: 500052

CASE:		-	DESIGN HHV		DESIGN HHV		DESIGN HHV		
BOILER LOAD		% MCR	100.0%		110.0%		75.0%		
STEAM FLOW		lb/hr	82,166		69,217		47,128		
NOTES:		Unit Design	250 TPD		275 TPD		187.5 TPD		
		Fuel HHV	4,800 Btu/lb		4,800 Btu/lb		4,800 Btu/lb		
		Excess Air	80%		70%		90%		
		Load ID	100%MCR		110%MCR		75%		
		Cleanliness	Nom. Foul		Nom. Foul		Nom. Foul		
6 FLUE GAS TEMPERATURES									
LVG. 1st. RAD PASS		°F	1381		1428		1324		
LVG. 2nd. RAD. PASS		°F	1277		1320		1206		
LVG. 3rd. RAD. PASS (FEGT)		°F	1095		1130		1014		
PLATEN SH HORZ. BANK IN		°F	846		867		766		
FINAL SH IN		°F	818		837		765		
INTERMEDIANT SH IN		°F	785		799		749		
LOWER ECON. IN		°F	746		754		729		
MIDDLE ECON.IN		°F	620		623		600		
UPPER ECON. IN		°F	515		517		494		
UPPER ECON. OUT		°F	432		435		414		
7 AIR TEMPERATURES									
AMBIENT AIR		°F	80		80		80		
FD FAN OUTLET		°F	80		80		80		
STEAM COIL OUTLET		°F	80		80		80		
8 HEAT RELEASE RATES									
GROSS HEAT INPUT		MBtu/hr	100,000		110,000		76,000		
NET HEAT AVAILABLE		MBtu/hr	82,789		91,066		62,089		
GRATE AREA		ft2							
FURNACE EPRS AREA		ft2							
FURNACE VOLUME		ft3							
GRATE HEAT RELEASE	G	Btu/hr/ft2							
FURNACE EPRS HEAT RELEASE	N	Btu/hr/ft2							
FURNACE VOL. HEAT RELEASE	G	Btu/hr/ft3							
9 FLUE GAS VELOCITIES									
ENT. 1st / 2nd PLATEN SH PASS		ft/sec	16.6		17.6		12.6		
ENT. PLATEN SH HORZ. BANK		ft/sec	12.4		13.4		9.6		
ENT. FINAL SH		ft/sec	13.1		13.9		9.9		
ENT. INTERMEDIANT SH		ft/sec	16.3		17.2		12.6		
ENT. LOWER ECON.		ft/sec	15.8		16.6		12.2		
ENT. MIDDLE ECON.		ft/sec	14.2		14.8		10.9		
ENT. UPPER ECON.		ft/sec	12.8		13.4		9.8		
10 MISCELLANEOUS									
NET STEAM GEN. HEAT OUTPUT		MBtu/hr	69,406		77,228		52,078		
% EXCESS AIR		%	80		70		90		
%O2 IN FLUE GAS		% vol. dry	9.38		8.69		10.54		

DEUTSCHE BABCOCK
DB RILEY, INC.

PREDICTED PERFORMANCE SUMMARY
RETROFIT OF FOUR EXISTING UNITS

Name: WAPC FOR: MCKAY BAY
Location: TAMPA, FLORIDA Unit No.: 1, 2, 3, & 4

Notes: *Based on DBR Drawing No. 500052LPS-04*

Revision: 14-Oct-98

CONTRACT NO. 500052

CASE:	-	DESIGN HHV	DESIGN HHV	DESIGN HHV
BOILER LOAD	% MCR	100.0%	110.0%	75.0%
STEAM FLOW	lb/hr	82,188	89,217	47,128
NOTES:	Unit Design	250 TPD	275 TPD	187.5 TPD
	Fuel HHV	4,800 Btu/lb	4,800 Btu/lb	4,800 Btu/lb
	Excess Air	80%	70%	90%
	Load ID	100%MCR	110%MCR	75%
	Cleanliness	Nom. Foul	Nom. Foul	Nom. Foul

11 UNIT EFFICIENCY

DRY FLUE GAS LOSS	%	11.2	10.4	11.3
FUEL MOISTURE LOSS	%	7.6	7.5	7.4
HYDROGEN COMB. LOSS	%	8.2	8.2	8.2
AIR MOISTURE LOSS	%	0.3	0.3	0.3
UNBURNED CARBON LOSS	%	2.3	2.3	2.3
RADIATION LOSS	%	0.6	0.6	0.7
UNACCOUNTABLE LOSS	%	0.5	0.5	0.5
MANUFACTURER'S MARGIN	%	1.0	1.0	1.0
TOTAL LOSSES	%	31.7	30.8	31.7
UNIT EFFICIENCY	%	68.3	69.2	68.3

12 FUEL

FUEL TYPE		MSW
CARBON	% wt	27.30
HYDROGEN	% wt	3.67
OXYGEN	% wt	20.62
NITROGEN	% wt	0.33
SULFUR	% wt	0.10
CHLORINE	% wt	0.02
H2O	% wt	30.00
ASH	% wt	18.06
TOTAL	% wt	100.00
GCV (HHV)	Btu/lb	4,800

h. Primary and Secondary Combustion Air Ducts including:

1) Associated hangers

2) Instruments

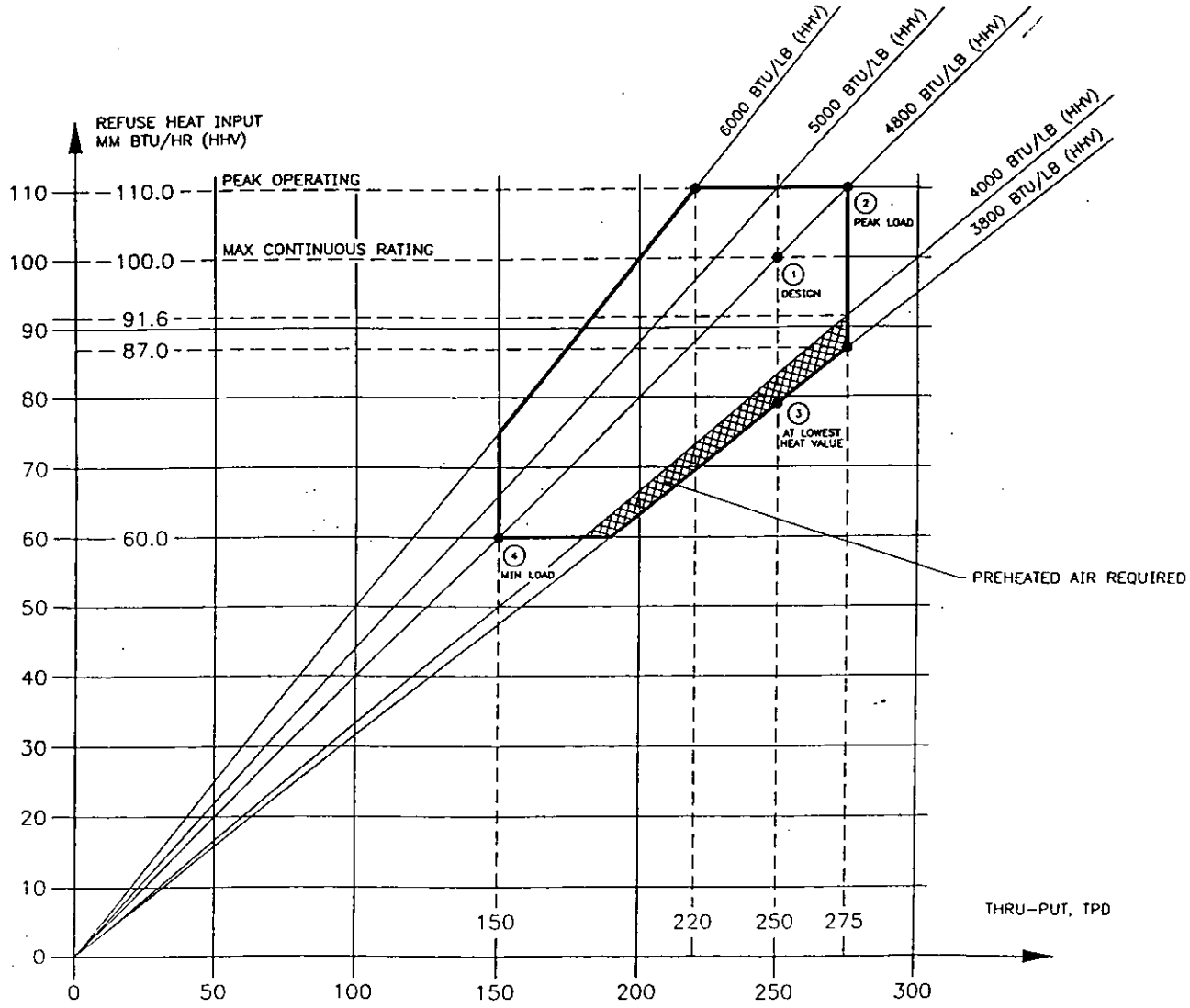
3) Control valves

6.0 PERFORMANCE AND DESIGN DATA

a. Each grate system and ram feeder shall be designed for heavy duty continuous service under the following conditions:

Effective grate area	311 ft²
Thermal grate load	321,600 Btu/sq ft hr, HHV
Mechanical grate load	65.4 lb/sq ft hr
Design refuse nominal capacity	250 short tons/day
Design refuse-heating value, HHV	4800 Btu/lb
Maximum continuous fuel input, MMBtu/hr	100.00
Design ambient air temperature	80°F
Relative humidity	60%
Design combustion air temperature	80°F at 4800 Btu/lb refuse, 250 ton/day 250°F at 3800 Btu/lb refuse, 250 ton/day

b. Each unit shall be capable of operating over a wide range of refuse conditions as shown on Von Roll Inc. Drawing No. 2009 G 320 001 Rev A.



McKAY BAY RETROFIT
REFUSE TO ENERGY FACILITY
TAMPA, FLORIDA

GRATE R-10030 FURNACE
LOAD RANGE DIAGRAM

DCP 2-3-99

SCALE: NONE

DRAWING NUMBER 2009 G 320 001 REV A

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August 30, 1999

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: City of Tampa McKay Bay Refuse-to-Energy Facility
Revised Stack Location Modeling
DEP File No. 0570127-002-AC
CDM PN 6616-26441

Dear Mr. Fancy:

Camp Dresser & McKee (CDM) modeled the air quality impacts associated with the final proposed stack location at the McKay Bay Refuse-to-Energy Facility. The results of the modeling change no conclusions previously presented to the Department. The following is provided for your information and for inclusion in the referenced file.

The final proposed stack location is approximately 36-feet from the location assumed for the dispersion modeling in the September 1997 permit application. We have remodeled and evaluated the effects of this change in location on building aerodynamics, proximity to the property boundary, and impacts in Class II areas. The Class I area impacts were not remodeled because changes to impacts are expected to be extremely small at the 75-km distance to the nearest Class I area. A set of revised tables is attached which briefly summarizes our findings.

As shown at the bottom of the revised Table 6-6, the predicted normalized impacts increased slightly from repositioning the stack. The most significant increase was 15% for the 3-hour highest of the second-high (HSH) values. Consequently, the revised impacts for criteria pollutants as compared to Class II Significant Impact Levels (SILs) also increased slightly. However, despite small increases in the SILs analysis, the findings documented in the September 1997 permit application remain unchanged. As shown on the revised Table 6-9, no new pollutants exceed the SILs as a result of relocating the stack. Also, as before, no increments or AAQS will be exceeded. The 3-hour SO_2 impact, which was the largest change, went from 53.55 $\mu g/m^3$ to 61.74 $\mu g/m^3$ but is only 37% of the 1,300 $\mu g/m^3$ AAQS.

As part of this evaluation, the net change in impacts from the existing facility to the proposed modification was also reviewed. The net change in impact is used to determine what pollutants exceed the SILs and the extent of the Significant Impact Area. In the process of

remodeling the net impacts for the future stack, an error was found in the coordinates of one of the existing stacks. After correcting the existing stack location in conjunction with moving the future stack, the combined effect is an approximate 50% decrease in net impacts. The net decreases shown in the revised Table 6-14 cause the annual NO_2 and Annual SO_2 to fall below the SILs.

The combined result of relocating the stack and correcting the existing stack location in the netting analysis changes the values reported in the permit application. However, these changes are not significant and combine to show a net improvement in regional air quality. Consequently, the regulatory findings presented in the September permit application do not change.

If you have any questions in this regard, do not hesitate to contact me.

Sincerely,

CAMP DRESSER & McKEE INC.

Daniel E. Strobridge, QEP
Associate

c: N. McCann
G. Grotecloss
D. Dee
FDEP SW District
HCEPC

Table 6-6
Normalized Modeling Results [1]
Project Vicinity (Class II Area)
Tampa McKay Bay Refuse-to-Energy Facility
Relocated Stack (33', 17.4')

Year	High or High Second High (H/HSH)	1-Hour (µg/m³)/(g/s)	3-Hour (µg/m³)/(g/s)	8-Hour (µg/m³)/(g/s)	24-Hour (µg/m³)/(g/s)	Annual (µg/m³)/(g/s)
1987	H	**5.08550** (-52, -294)	2.75841 (-100, -173)	**1.85839** (100, -173)	1.10143 (129, -153)	0.07249 (-306, -257)
	HSH	4.25900 (-137, -376)	2.62982 (-200, 346)	1.81447 (150, -260)	0.69817 (-306, -257)	--- ---
1988	H	4.33490 (-257, -306)	2.94079 (-257, -306)	2.21387 (-68, -188)	**1.12191** (-200, 346)	**0.11000** (-257, -306)
	HSH	4.31845 (-257, -306)	2.60434 (-69, -394)	1.50355 (-200, -346)	**0.99306** (-68, -188)	--- ---
1989	H	4.63786 (-52, -294)	**3.20794** (-200, 346)	**2.53921** (-137, -376)	0.97904 (-35, -197)	0.09035 (-137, -376)
	HSH	**4.36720** (-257, -306)	**2.99711** (-137, -376)	1.63735 (0, -400)	0.93050 (-137, -376)	--- ---
1990	H	4.52949 (-137, -376)	2.62793 (103, 282)	1.63327 (-257, -306)	0.76256 (-150, 260)	0.07412 (-260, 150)
	HSH	4.22584 (193, 230)	2.48587 (137, -346)	1.54090 (-257, -306)	0.69317 (-103, 282)	--- ---
1991	H	4.58341 (-200, -346)	3.14517 (306, -257)	1.61824 (-257, -306)	0.91379 (-257, -306)	0.08080 (-260, 150)
	HSH	4.30643 (-200, -346)	2.25991 (-200, -346)	1.49958 (-257, -306)	0.86275 (-257, -306)	--- ---

* Note: Maximum values for each averaging period are highlighted in bold type.
[1] Emission rate is normalized to 1 g/s for the total Facility (4 units).

Maximum 5-year Normalized Model Results

High or High Second High (H/HSH)	1-Hour (µg/m³)/(g/s)	3-Hour (µg/m³)/(g/s)	8-Hour (µg/m³)/(g/s)	24-Hour (µg/m³)/(g/s)	Annual (µg/m³)/(g/s)
H	5.08550	3.20794	2.53921	1.12191	0.11000
% change	-3 98	3.30	9.53	5.28	5.84
HSH	4.36720	2.99711	1.81447	0.99306	--
% change	2.67	15.29	3.31	4.74	

Table 6-8

Pollutant-Specific Impacts [1]

Tampa McKay Bay Refuse-to-Energy Facility

Relocated Stack (33', 17.4')

Pollutant	*Facility Emission Rate (g/s)*	*Averaging Time*	*Maximum Facility Vicinity Impact ($\mu g/m^3$)*
SO_2	20.60	3-hour	66.08
		24-hour	23.11
		Annual	2.27
NO_x	20.22	Annual	2.22
CO	6.00	1-hour	30.51
		8-hour	15.24
PM10	1.42	24-hour	1.59
		Annual	0.16
Dioxin	1.55E-06	8-hour	3.93E-06
		24-hour	1.73E-06
		Annual	1.70E-07
Mercury	7.00E-03	8-hour	1.78E-02
		24-hour	7.85E-03
		Annual	7.70E-04
Cadmium	2.10E-03	8-hour	5.33E-03
		24-hour	2.36E-03
		Annual	2.31E-04
Lead	2.30E-02	8-hour	5.84E-02
		24-hour	2.58E-02
		Annual	2.53E-03
HCl	7.82	8-hour	19.86
		24-hour	8.77
		Annual	0.86
HF	7.56E-01	8-hour	1.92
		24-hour	0.85
		Annual	0.08
Beryllium	5.80E-05	8-hour	1.47E-04
		24-hour	6.51E-05
		Annual	6.38E-06
Ammonia	1.82	8-hour	4.62
		24-hour	2.04
		Annual	0.20

Note: [1] Impacts are highest maximum short-term and annual impacts.

Table 6-9
Comparison of Proposed Facility PSD Impacts to Significant Impact Levels (SILs)
Tampa McKay Bay Refuse-to-Energy Facility
Relocated Stack (33', 17.4')

Pollutant	Averaging Time	Refined Modeling		
		Concentration ($\mu g/m^3$)	SILs ($\mu g/m^3$)	Percent of SIL
SO_2	3-hour	66.08	25	264%
	24-hour	23.11	5	462%
	Annual	2.27	1	227%
NO_2	Annual	2.22	1	222%
CO	1-hour	30.51	2000	2%
	8-hour	15.24	500	3%
PM_{10}	24-hour	1.59	5	32%
	Annual	0.16	1	16%
Pb	Quarter	0.010 [b]	0.1	10%

[a] Significant Impact Levels currently recommended by the National Park Service. NPS SILs are more stringent, or lower than (about 1/2 to 1/3 of) those proposed by the U.S. EPA as part of New Source Review Reform (61 FR 38292, July 23, 1996).

[b] Conservatively estimated as four times the maximum annual lead impact.

NOTE: Class I modeling does not reflect the revised stack coordinates.

Table 6-10
Comparison of Proposed Facility Impacts to FDEP "Ambient Reference Concentrations"
Tampa McKay Bay Refuse-to-Energy Facility
Relocated Stack (33', 17.4')

Pollutant	Averaging Time	Refined Modeling		
		Concentration (µg/m3)	ARCs (µg/m3)	Percent of ARCs
Dioxin [1]	Annual	1.70E-07	1.21E-06	14%
Mercury	8-hour	0.018	0.1	18%
	24-hour	0.008	0.024	33%
	Annual	0.001	0.3	0%
Cadmium	8-hour	5.33E-03	0.02	27%
	24-hour	2.36E-03	0.005	47%
	Annual	2.31E-04	0.00056	41%
Lead	8-hour	0.058	0.5	12%
	24-hour	0.026	0.12	22%
	Annual	0.003	0.09	3%
HCl	8-hour	19.86	75	26%
	24-hour	8.77	18	49%
	Annual	0.86	7	12%
HF	8-hour	1.92E+00	26	7%
	24-hour	8.48E-01	6.2	14%
Beryllium	8-hour	1.47E-04	0.02	1%
	24-hour	6.51E-05	0.005	1%
	Annual	6.38E-06	4.20E-04	2%
Ammonia	8-hour	4.62E+00	170	3%
	24-hour	2.04E+00	41	5%
	Annual	2.00E-01	1.00E+02	0%

[1] The ARC is for toxic equivalent dioxin, 2,3,7,8-TCDD. This was adjusted for total dioxins and furans, consistent with the Facility impact analysis, by multiplying by 55. The conversion factor is from 60 FR 65395, December 19, 1995, Table 1.

Table 6-11
Model Parameters[1] for Net Impact Analysis
Tampa McKay Bay Refuse-to-Energy Facility

Parameter	*Two Existing Stacks*	*Future Proposed Single Stack*
Height	50.3 m	61.3 m
Exit Diameter	1.77 m each	2.57 m
Exit Temperature	547 K	416 K
Exit Velocity	27.889 m/s	22.215 m/s
SO_2 Emission Rate[2]	17.63 g/s	20.25 g/s
NO_x Emission Rate[2]	29.08 g/s	19.39 g/s

[1] Based on four operating units and two stacks for the existing Facility, and one stack for the upgraded future Facility.
For the SILs analysis, the existing stack parameters are based on 100% load and 5000 BTU/lb.
The future stack parameters are based on 115% load and 6000 BTU/lb.

[2] Emission rates are for the total combined Facility of 4 units. Existing emission rates are the highest Facility test result since its reconstruction in 1985 (6 SO_2 tests and 6 NO_x tests in that period). Future emission rates are the maximum potential to emit. See Section 2 and Appendix A.

Table 6-12
5-year Modeled Maximum Net Increases in Facility Impacts
Due to Proposed Facility Retrofit
Project Vicinity (Class II Area)
Tampa McKay Bay Refuse-to-Energy Facility
Relocated Stack (33', 17.4')

Year	SO_2 3-Hour ($\mu g/m^3$)	SO_2 24-Hour ($\mu g/m^3$)	SO_2 Annual ($\mu g/m^3$)	NO_x Annual ($\mu g/m^3$)
1987	**35.94529** (-282, 103)	7.37647 (-282, 103)	0.64352 (-282, 103)	0.57353 (-94, -34)
1988	25.77973 (282, -103)	5.66739 (-282, 103)	0.38467 (-94, -34)	0.35314 (-94, -34)
1989	21.63789 (-282, 103)	4.62102 (69, -394)	0.22368 (-282, 103)	0.19715 (-94, -34)
1990	23.73731 (-282, 103)	6.80936 (-87, -50)	**0.78592** (-282, 103)	**0.68407** (-94, -34)
1991	27.92719 (-282, 103)	**7.94401** (-282, 103)	0.65938 (-282, 103)	0.60252 (-94, -34)

* Note: Maximum values for each averaging period are highlighted in bold type and summarized below.

Summary of Maximum Increases

Pollutant	3-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)
SO_2	35.94529	7.94401	0.78592
% Change	-36.2	-56.0	-59.1
NO_x	--	--	0.68407
% Change			-43.0

Table 6-14
Comparison of Maximum Increases in Facility Impacts to Significant Impact Levels (SILs)
Tampa McKay Bay Refuse-to-Energy Facility
Relocated Stack (33', 17.4')

		Facility Vicinity		
Pollutant	***Averaging Time***	***Concentration ($\mu g/m^3$)***	***SILs ($\mu g/m^3$)***	***Percent of SIL***
SO_2	3-hour	35.95	25	144%
	24-hour	7.94	5	159%
	Annual	0.79	1	79%
NO_2	Annual	0.68	1	68%

Notes: [1] National Park Service (NPS)/Fish and Wildlife Service (FWS) Class I SILs
[2] U.S. EPA proposed Class I SILs (61 FR 38292, July 23, 1996).

Table 6-15
PSD Class II Increment
Compliance Demonstration
Tampa McKay Bay Refuse to Energy Facility
Relocated Stack (33', 17.4')

Pollutant	*Averaging Time*	*Facility Vicinity*		
		Maximum Increase in Facility Impacts ($\mu g/m^3$)	*Class II Increment ($\mu g/m^3$)*	*% of Increment ($\mu g/m^3$)*
SO_2	3-hour	35.945	512	7%
	24-hour	7.944	91	9%
	Annual	0.786	20	4%
NO_2	Annual	0.684	25	3%

Table 6-16
AAQS Compliance Demonstration
Tampa McKay Bay Refuse to Energy Facility
Relocated Stack (33', 17.4')

Pollutant	*Averaging Time*	*Highest, High Second Highest Concentration ($\mu g/m^3$) [1]*	*Background ($\mu g/m^3$) [2]*	*Total Concentration ($\mu g/m^3$)*	*AAQS ($\mu g/m^3$) [3]*	*% of AAQS ($\mu g/m^3$)*
SO_2	3-hour	61.74	422	483.7	1300	37%
	24-hour	20.46	79	99.5	260	38%
	Annual	2.27	14	16.3	60	27%
NO_2	Annual	2.22	18	20.2	100	20%

Notes:

[1] Highest of the second highest modeled impacts were used for short-term averages, because one excess per year is allowed.

[2] Maximum second-highest monitored value during 1993-1995. SO_2 values were monitored at the at the Causeway Blvd. monitoring station.
NO_2 values were monitored at the Gandy Blvd. monitoring station.

[3] AAQS shown are the Florida AAQS, which are more restrictive for the annual SO_2 than the National AAQS.

ORIGINAL

Table 6-8

Pollutant-Specific Impacts 1

City of Tampa's McKay Bay Refuse-to-Energy Facility

Pollutant	Facility Emission Rate (g/s)	Averaging Time	Maximum Facility Vicinity Impact ($\mu g/m^3$)	Maximum Class I Area Impact ($\mu g/m^3$)
SO_2	20.60	3-hour	63.97	1.52
		24-hour	21.95	0.31
		Annual	2.14	0.02
NO_2	20.22	Annual	2.10	0.022
CO	6.00	1-hour	31.78	---
		8-hour	13.91	---
PM10	1.42	24-hour	1.51	0.02
		Annual	0.15	0.0015
Dioxin	1.55E-06	8-hour	3.58E-06	---
		24-hour	1.65E-06	---
		Annual	1.61E-07	---
Mercury	7.0E-03	8-hour	1.62E-02	---
		24-hour	7.46E-03	---
		Annual	7.28E-04	---
Cadmium	2.1E-03	8-hour	4.78E-03	---
		24-hour	2.20E-03	---
		Annual	2.14E-04	---
Lead	2.3E-02	8-hour	5.33E-02	---
		24-hour	2.45E-02	---
		Annual	2.39E-03	---
HCl	7.82	8-hour	18.13	---
		24-hour	8.33	---
		Annual	0.81	---
HF	0.756	8-hour	1.75	---
		24-hour	0.81	---
		Annual	0.08	---
Beryllium	5.8E-05	8-hour	1.34E-04	---
		24-hour	6.18E-05	---
		Annual	6.03E-06	---
Ammonia	1.82	8-hour	4.22	---
		24-hour	1.94	---
		Annual	0.19	---

Note: [1] Impacts are highest maximum short-term and annual impacts.

From 60 FR 65392-5, Dec. 19, 1995, Table 1.
MWC Organic Emissions (measured as total mass dioxins/furans):

- Dioxins/furans (performance test by EPA Reference Method 23)
  Large and small MWC plants..... 13 ng/dscm total mass (mandatory) or 7 ng/dscm total mass (optional to qualify for less frequent testing).<SUP>*b.

<SUP>b Although not part of the dioxin/furan limit, the limit of 13 ng/dscm total mass is equal to about 0.1 to 0.3 ng/dscm TEQ. The optional reduced testing limit of 7 ng/dscm total mass is equal to about 0.1 to 0.2 ng/dscm TEQ.

$$\frac{\text{TOTM}}{\text{TEQ}} = \frac{7}{0.127} = 55$$