Attendance

6/19/81 McKAY BAY REFUSE TO ENERGY

Joe Murdoch	City of Tampa
Rick Garrity	"
Carl Bock	FDER
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June 18, 1981

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

Dear Mr. Fancy:

As of June 11, 1981, the City of Tampa is the lead agency for the implementation of the McKay Bay Resource Recovery Project. The data presented here is the data that will be used in the actual PSD application.

The questions that need to be addressed in our June 18, 1981 meeting will include the following:

1. Emission Data.
2. Monitoring Requirements.
3. Modeling.
4. Offset Requirements.
5. LAER and BACT.
6. The Other Impacts Analysis.

This material represents our approach to the PSD application.

It is hoped that the results of this meeting will clear the way for a straight forward permit review.

Sincerely,

HENNINGSON, DURHAM & RICHARDSON, INC.

Easel Roberts

Easel Roberts

BACKGROUND

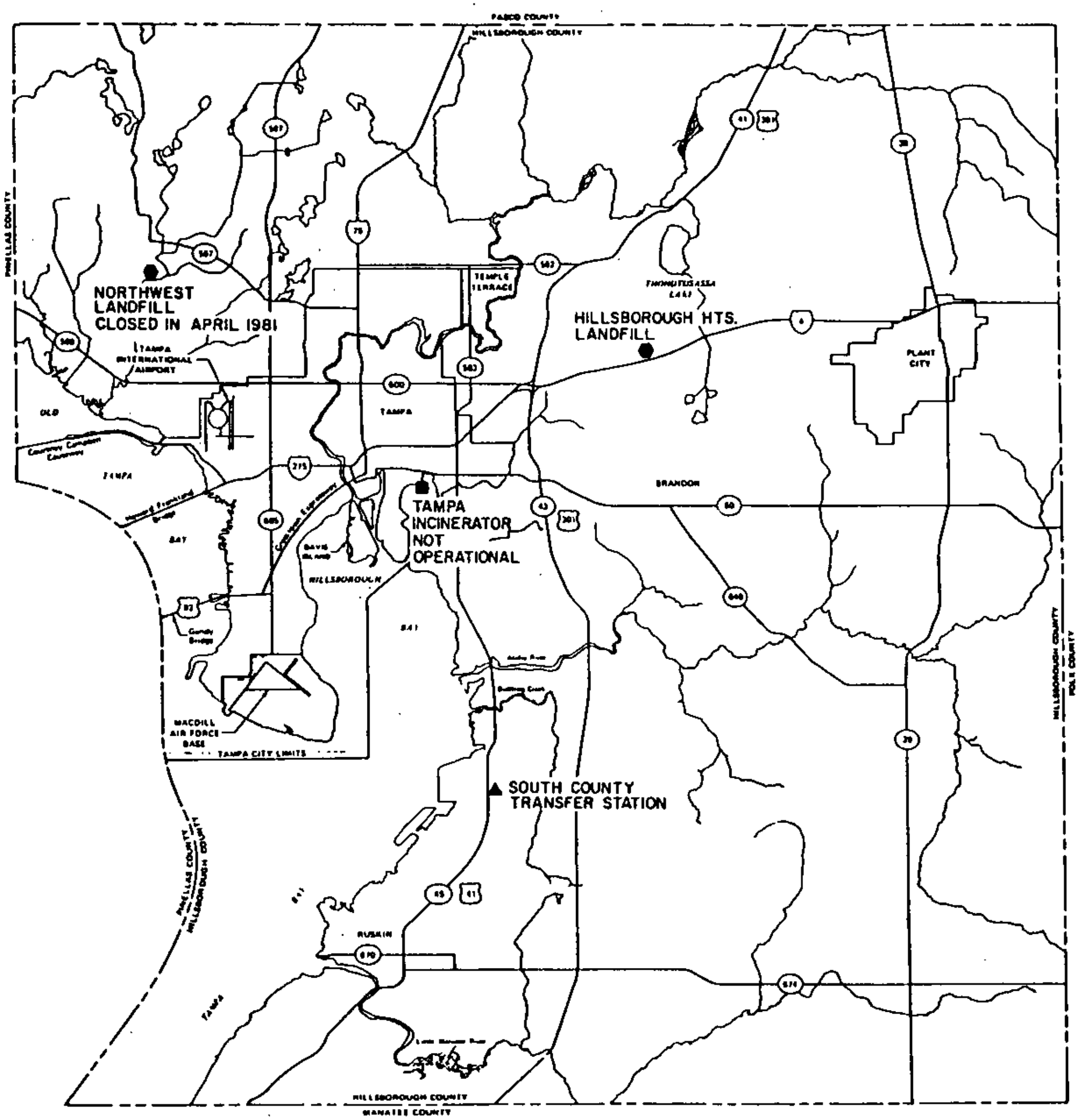
In Hillsborough County, with the City of Tampa as the lead agency under a negotiated interlocal agreements, there has been an increased interest in solid waste disposal and the concept of resource recovery from solid wastes. This has been stimulated by an increased awareness of the environmental and siting problems associated with past disposal methods, and by the shortages and increased prices of energy and recyclable materials. Each of the cities in Hillsborough County maintains a solid waste collection system within its respective boundaries, while the County is responsible for the collection system in the unincorporated areas. Residential waste is usually collected twice a week, with more frequent collections for commercial waste.

The solid waste generated in Hillsborough County is currently disposed of in the Hillsborough Heights Landfill. In previous years, other landfills were used, but are now closed. The Ruskin Landfill operated until August 1, 1978 when the waste they were handling was diverted to the Taylor Road Landfill. The Plant City Landfill operated until October 1, 1979 when this waste was diverted to the Taylor Road Landfill. The City of Tampa operated an incinerator until December 31, 1979 when it was closed because of air and water pollution problems. When this facility creased operation, those wastes were diverted to the Taylor Road Landfill also. Hillsborough Heights replaced the adjacent Taylor Road Landfill in February 1980. In April, 1981 the Northwest Landfill was closed. Figure 1 shows the locations of existing solid waste facilities in Hillsborough County.

Because of landfill capacity limitations and legal restrictions concerning the only operating site, the City has initiated actions to site, design and permit a new landfill by March 1982. The new landfill will be used for both a residue disposal site for the proposed resource recovery system and as an emergency back-up system.

Resource Recovery Plan

In September 1980, the Board of County Commissioners of Hillsborough County approved a resource recovery plan to minimize solid waste management costs by converting the municipal solid waste to energy and secondary materials. The revenues from the energy and secondary materials would help decrease the total disposal cost.



N

SCALE IN MILES

0 1 2 3 4

EXISTING
SOLID WASTE FACILITIES

HILLSBOROUGH COUNTY

FIGURE 1

As presently envisioned, the resource recovery plan has three parts: 1) The siting of a new landfill; 2) rehabilitating and enlarging the existing Tampa Incinerator, and; 3) the construction of a new resource recovery facility.

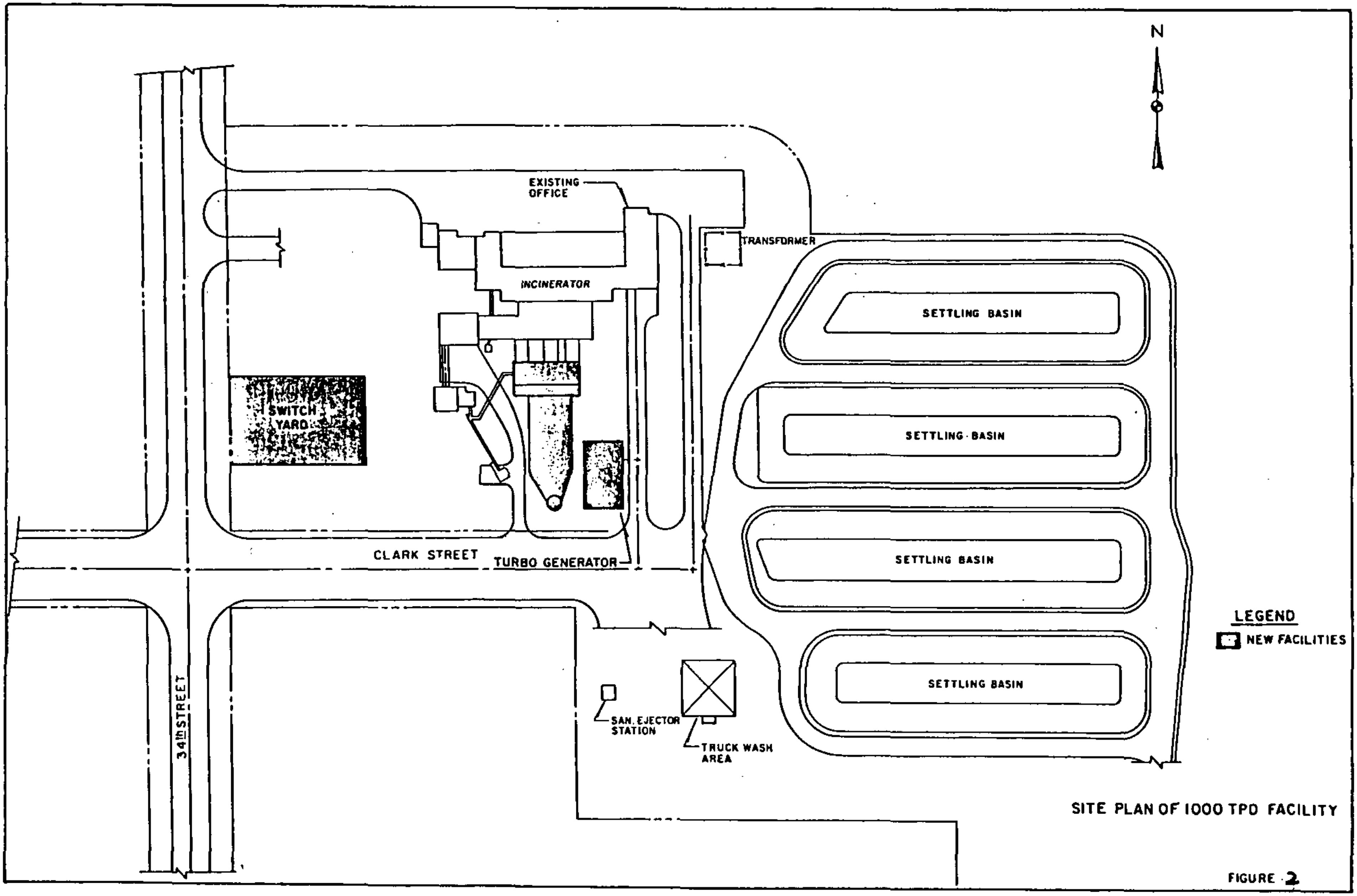
Tampa Incinerator Conversion (TIC)

The Tampa Incinerator is located on a 14 acre site adjacent to McKay Bay south of Route U. S. 60. Figure 2 is the site plan of the Incinerator.

The incinerator system consists of three mass burn combustion trains without energy recovery, based upon the Volund technology. Each unit is rated at 250 TPD. Our design engineers have inspected the Incinerator, and it is our opinion that it can be rehabilitated and converted into a resource recovery system capable of generating electricity for sale to TECO. To renovate the incinerator, waste heat boilers, electrostatic precipitators for particulate control, and turbine generators with all support equipments and instrumentation will have to be added. In addition, the inplace combustion system will have to be modified to bring the facility into "like new" operating condition for long-term operation and incorporate modern design features of modern Volund systems.

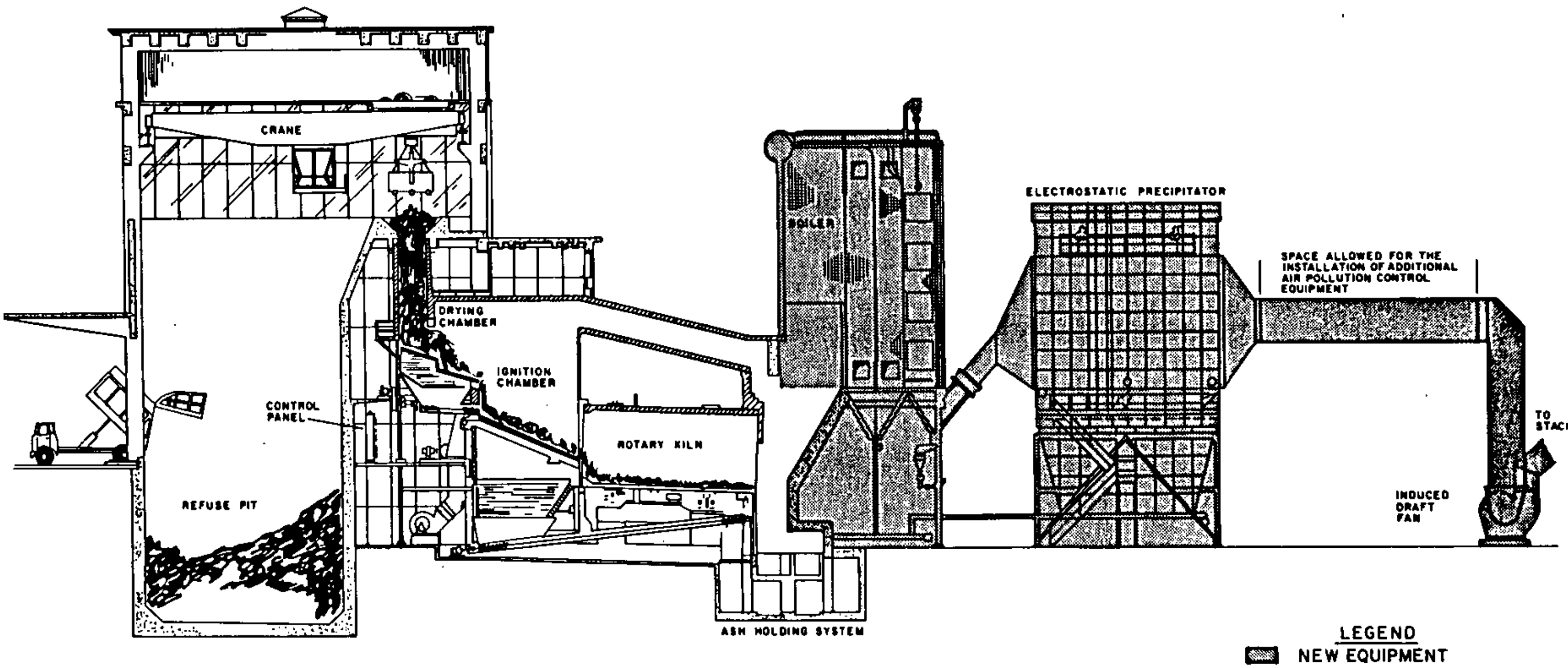
Figure 3 shows a potential equipment configuration, with a boiler and electrostatic precipitator added to the existing equipment.

Three combustion trains were initially constructed with adequate space left in the building including all foundations required to add a fourth unit at a later date. We are of the opinion that the fourth unit should be added, the design capacity of the facility be increased to 1000 TPD. By considering the online equipment availability, we are of the opinion that approximately 300,000 tons per year of solid waste could be disposed of by the facility.



SITE PLAN OF 1000 TPD FACILITY

FIGURE 2



CROSS SECTIONAL VIEW OF THE TAMPA INCINERATOR WITH RESOURCE RECOVERY EQUIPMENT ADDED

Figure 3

The steam generated by the four boilers will be used to produce electricity in a 21 MW condensing turbine generator. All generation support systems will be provided to sustain operation on an annual operating schedule consistent with parameters used in the electrical utility industry.

Air emission generated by the combustion process will be controlled within accepted standards by a multi-cyclone mechanical separator and an electrostatic precipitator (ESP) for each incinerator/boiler train. The treated flue gas will be vented through individual flues within a common chimney.

Ash produced by the combustion process will be handled by a wet system. The wet ash will be dewatered and loaded into trucks for subsequent disposal in the County's designated residue disposal site. On a dry basis, the ash quantity requiring landfilling is estimated to be a 15 percent by weight and 5 percent by volume of the input solid waste combusted.

New Resource Recovery Facility (RRF)

The companion facility in the county resource recovery plan is the construction of a new facility to accommodate a significant portion, i.e. 50-60% of the solid waste generated. The site of this facility will be located adjacent to the old Tampa Incinerator site on McKay Bay. The capacity of the facility is proposed to be 1000 TPD.

The apparent technology options available are another rotary kiln mass burn resource recovery system or the waterwall mass burn resource recovery system. The ultimate energy output from the system finally selected will be electrical eneregy for sale to TECO.

Mass burn technology, a variation of which was used at the Tampa Incinerator, is based upon the combustion of unprocessed solid waste in a specifically designed furnace system that facilitates complete burnout and generates heat for subsequent energy recovery. The heat produced will pass through waste heat boilers to produce high pressure steam which will be converted into electricity by inplant turbine generators.

Table 1

Expected Emissions

	TIC gm/s	TIC TPY	RRF gm/s	RRF TPY	TOTAL TPY
Particulate (Controlled)	4.6	160	3.2	109	269
Sulfur Dioxide	20.8	722	12.1	420	1142
Nitrogen Oxides	26	903	9.5	330	1233
Carbon Monoxide	1.68	58	5.8	200	258
Hydrocarbons	.92	32	.92	32	64
Lead	.47	16.3	.47	16.3	32.6
Mercury (vaporous)	.05	1.8	.05	1.8	3.6
Mercury (particulate)	2.3x10-3	.08	2.3x10-3	.08	.16
Beryllium	4.0x10-5	1.4x10-3	4.0x10-5	1.4x10-3	2.8x10-3
Flouride	.53	18.4	.53	18.4	32.6
Hydrogen Chloride	23.7	823	23.7	823	1646

There has been some confusion on the applicability of the NESHAP rules to this project. According to 40 CFR 61.30 and 61.50 the NESHAP rules concerning our emission of Beryllium are applicable but the Mercury NESHAP rules are not.

The NESHAP rules for Beryllium require that no more than 10 grams/day be emitted. The conservative data used in these estimates indicate an emission rate of less than seven (7) grams of Beryllium per day.

The NESHAP rules for Mercury are applicable to those sources that process mercury ore, use mercury chlor-alkali cells, or dry and/or incinerate wastewater treatment plant sludges. Neither the TIC nor the RRF will process or burn any wastewater treatment plant sludges.

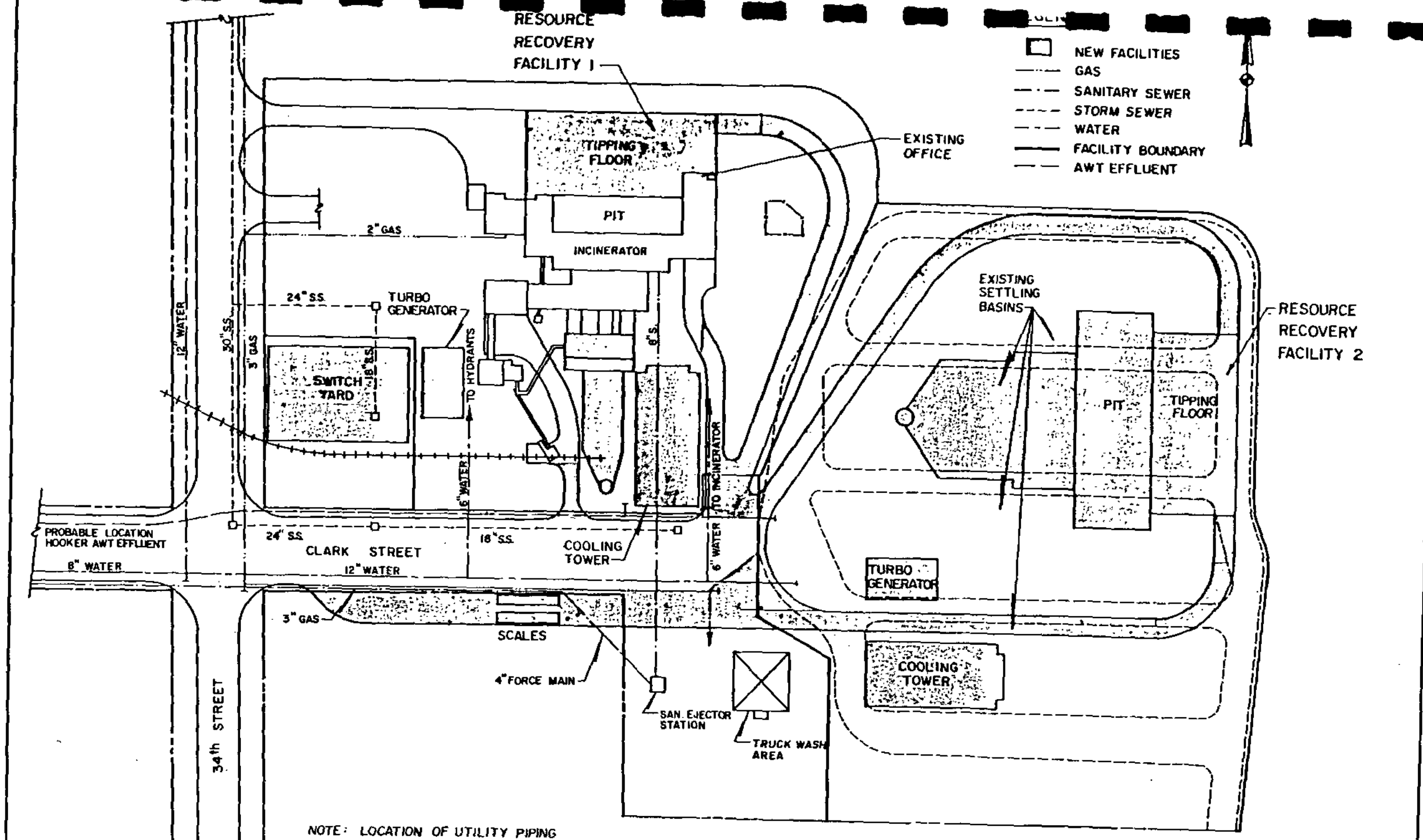
The important characteristic of the mass burn systems is that no processing or separation of the refuse components is required other than to remove oversize bulky items from the mixed waste before refuse is fed to the furnaces for combustion. Noncombustibles in the refuse are handled as furnace ash residue. Recyclable materials such as ferrous metals and aluminum can be recovered from the ash residue and sold. The remaining non-recyclable residue fraction normally requires landfilling. The air pollution control system used most often by the various system vendors are multicyclones followed by individual multifield electrostatic precipitors.

For discussion purposes only, we selected a mass burn technology offered by one of the full service vendors to conceptually design the New Facility. The principal difference between the system tentatively selected and the Volund rotary kiln system are the grate system used to ensure complete combustion of the unprocessed solid waste and the steam generation system. Figure 4 is a site plan showing both facilities' configuration.

EMISSIONS

The emissions that will be used in the modeling of the facilities are shown in Table 1.

The data for the TIC was obtained from Waste Management Inc. (WMI) test data on similar units the RRF data is conservative data assimilated from recent proposals for a similar facility



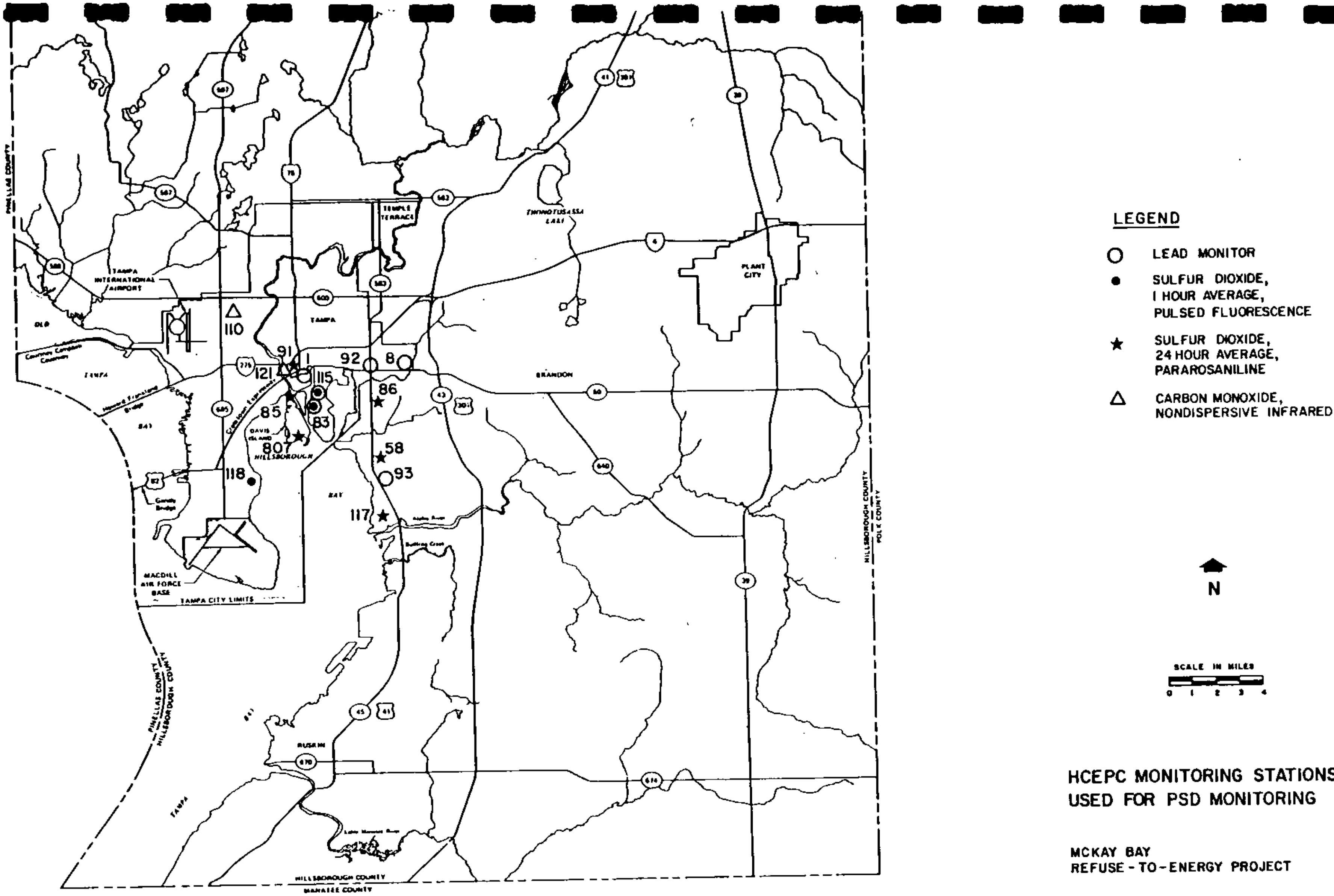
REHABILITATE EXISTING INCINERATOR 4-250 TPD UNITS AND INSTALL A 1000 TPD UNIT

MONITORING REQUIREMENTS

The Prevention of Significant Deterioration (PSD) regulations dated August 7, 1980 state that monitoring data is to be collected for each pollutant the source will emit in significant amounts. There is an exemption allowed, at the Administrator's discretion, if the modeled impacts are below certain amounts. The impact of most pollutants for which the Tampa Incinerator will be significant are below this de minimus value.

Both facilities will be significant sources for particulate, sulfur dioxide, nitrogen oxide, carbon monoxide, lead, beryllium, mercury, and hydrogen flouride. When the impacts of both facilities are included, the pollutants that exceeds the de minimus value are sulfur dioxide, lead, carbon monoxide, and hydrogen flouride. Monitoring data will be acquired from the Hillsborough County Environmental Protection Commission (HCEPC) monitors shown in Figure 5. It is proposed to use this monitoring data to fulfill the monitoring requirements of 40 CFR 52.21 (m)(iv). The hydroger flouride monitoring data requirements will need to be discussed in reference to FR 52724 of August 7, 1981 which allows discretion on the monitoring requirements for non-criteria pollutants.

The sulfur dioxide monitoring data will be supplied from seven existing monitors operated by the HCEPC. They include two pulsed flourescence monitors located on Hookers Point near the locations of the maximum annual impact. There are five Pararosaniline monitors located both west and east of the site which can be included at DER request, The lead data will be obtained from the four lead monitors in the downtown area. The carbon monoxide will be supplied from the nondispersive infared monitor located downtown.



HCEPC MONITORING STATIONS USED FOR PSD MONITORING

MCKAY BAY REFUSE-TO-ENERGY PROJECT

To determine the initial impact, the CRSTER model was used with 1974 meteorological data. The model was run specifically for the TIC. To include the RRF the values were added proportional to the emission rate. Even though the stacks will be separated by about 100 yds., the CRSTER model is adequate for this level of analysis. If each facilitiy were modeled separately the results would be smaller than those predicted. This scenario overlays both maximums instead of separating them by some distance. A copy of the modeling data is included in the attached Appendix.

The input emission rate was 1.0 gm/sec/250 TPD unit. This rate was used as a base amount to simplify converting the data to represent each pollutant. Table 2 shows the results of the modeling and the values presented in 40 CFR 52.21 (i)(8).

Table 2

Modeling Results for Both Facilities

	Deminimus Value, Avg. Time	**Highest Modeled Amount ug/m^3**
Particulate	10, 24 hr.	10.2
Sulfur Dioxide	13, 24 hr.	42.8
Nitrogen Dioxide	14, annual	6.0
Carbon Monoxide	575, 8 hr.	47.3 (3 hr. avg.)
Lead	0.1, 24 hr.	1.2
Mercury	0.25, 24 hr.	.14
Beryllium	$5x10^{-4}$, 24 hr.	$1.2x11^{-4}$
Flouride	.25, 24 hr.	1.4

The particulate data is included for your information.

The presented data demonstrates that the emission from both phases of the City of Tampa Resource Recovery Project will cause an small impact. It is requested at the DER render an opinion that no additional continuous monitoring data than that provided by the HCEPC be required. Monitoring data for flourides will be provided as negotiated.

MODELING

The air quality impacts will be modeled by using ISCLT and ISCST. ISC was selected because of the flexibility it allows with receptor location, its adaptability to differing topographical situations, and its ability to handle differing types of emissions (point, area & volume).

The input data for determining the impact of the sulfur dioxide emission will be the same as those used by CONSERV with a few added due to location differences and a few deleted because of the excessive distance. Before any source was deleted its effect on the impact area was determined by the use of PTDIS. If the value was less than 1 ug/m3 then its impact will be ignored. The emissions from the old incinerator will be included as a negative emission.

The receptor location will be in polar coordinates at 10 ring distances determined by the method proposd in the "Proposed Revision of the Guidelines on Air Quality Models".

OFFSETS

The sites chosen for the Resource Recovery Project are within nonattainment areas for particulate and ozone. This will require offsets from other facilities to be obtained for particulates and hydrocarbons.

The offsets for the particulate emission will come from the emission from the old incinerator. We are aware that these offsets will not be available until the SIP is approved by EPA. In the interim we propose to use the resource recovery exemption. To show a good faith effort each major source for particulate will be contacted to ascertain the availability of offsets.

To offset the hydrocarbon emissions we propose to use the existing New Source Allowance. Since the combined facilities will only emit 64 TPY, each facility alone would not need offsets but with the single permit application this will be our approach.

AIR EMISSION CONTROL

The air emissions control review will vary for each substance emitted from the stack with the Lowest Achievable Emission Rate (LAER) and Best Available Control Tehcnology (BACT) regulations providing the scope.

LAER

Emissions of particulates and volatile organic compounds (VOC) must comply with LAER regulations. For this project we support a LAER for particulates of 0.03 gr/dscf at 12% CO_2, 50% excess air. Based upon a review of the operating experience with dry and wet scrubbers, fabric filters, and electrostatic precipitators at solid waste incinerators and resource recovery facilities an electrostatic precipitator has been tentatively selected to achieve LAER for particulates. Analysis is preceding to determine the parameters of the electrostatic precipitator system; for instance, single vs. multiple units, number of fields, and qualified vendors.

The level of hydrocarbon emissions is influenced by the operation of the solid waste combustion unit and the uniformity of the feed. LAER compliance will be achieved by maintaining the maximum possible homogeneity in the solid waste feed, feeding the solid waste at uniform rates, and by sufficiently high combustion maintaining a temperatures and proper air control.

BACT

BACT analysis for the emission of nitrogen oxides, sulfur dioxide, carbon monoxide, lead, beryllium, mercury and hydrogen flouride is being prepard pursuant to applicable Federal and State regulations, notably Title 40, Part 52 of the Federal regulations, and the guidelines presented in the "Prevention of Significant Deterioration" workshop manual prepared by the U.S. Environmental Protection Agency. The BACT analysis has determined:

- The pollutants to which BACT applies (i.e., listed previously)

- The emission source to which BACT applies (i.e., the stack emissions).

Being determined are potentially sensitive air quality concerns which the Tampa project will affect.

The control strategies selected for BACT analysis are as follows:

Base

Pollutant	Strategy
sulfur dioxide	use of low sulfur solid waste as fuel
nitrogen oxides	combustion unit design and operation
carbon monoxide	combustion unit design and operation
lead	ESP, as design for particulate removal
beryllium	ESP, as design for particulate removal
mercury	no control
flouride	no control

Alternative

Pollutant	Strategy
sulfur dioxide	none available*
nitrogen oxides	dry or wet scrubbers
carbon monoxide	"
lead	"
beryllium	"
mercury	"
flouride	wet scrubbers

Systems are being tested for the control of some air emissions from the Tampa project subject to BACT (i.e., sulfur dioxide and nitrogen oxides). The lack of operating experience with these systems installed at resource recovery facilities suggests their use at the Tampa facility is not appropriate, but a BACT review will be conducted.

The economic and energy impact of the base alternative for the control of nitrogen oxides, sulfur dioxide, carbon monoxide, lead, beryllium, mercury, and hydrogen flouride will be considered as zero because the alternatives will be implemented for other dominant purposes or has no identifiable cost or energy usage. The environmental impacts will be developed concurrently with the modeling of the air quality impacts.

In summary, the air emissions control technologies to comply with LAER and BACT regulations have been tentatively identified. The development of design parameters and/or analysis of the environmental impact of the proposed technologies is underway.

OTHER IMPACTS

The Hillsborough County City-County Planning Commission publication entitled, "Population and Housing Estimates," April 1, 1970-April 1, 1980 projects the population of Hillsborough County to increase from 630,698 to 757,300 persons from 1980 to 1985. This increase of 126,602 people represents a 20% increase in 5 years. The future projections continue to the year 2000 with an estimated increase of 63% within 20 years. For the City of Tampa and the Hillsborough County project of the rehabilitation the present Tampa Bay incinerator and the construction of a new facility, the workforce is expected to average between 150 to 300 persons throughout the construction phase. With the present construction in the surrounding area it is feasible to state that the majority of construction workforce will be available locally. There may be some relocation to move closer to the project site but this action would be considered negligible in impact analysis. The figure of 150 persons represents less than .03% of the total population. For the operation of the facilities a projected employment of 65 persons per facility is expected, which again reduces the overall potential impact.

The most significant air emission anticipated during construction is fugitive dust generated by numerous vehicles for the transportation of the workforce. Additionally anywhere from 5-12 pieces of construction equipment will be used in excavating, scrapping, filling and compacting. Fugitive dust can be reduced by the frequent spraying of water on the site and roadway.

Noise generation is another characteristic of construction activity. This nuisance will be generally limited to normal working hours thus allowing a reduction of noise during the evening hours.

For the operational phase atmospheric emission will be controlled by the use of Electrostatic Precipitators (ESP). To date ESP's have the only proven technology for the successful removal of particulate matter. The efficiencies of the ESP's have been proven to be as high as 99.9%. Another emission of potential concern is the pollutant "dioxins". The American Society of Mechanical Engineers reports that the risk of cancer caused from the "dioxins" is minimal and is several orders of magnitude less than the risk of death to which the general public is presently exposed in everyday life. Fugitive dust emissions for the operational phase are caused primarily by the frequent delivery of solid waste to the facility. With proper surface treatment these emissions are minimized. Dust and odors in the refuse handling area will be managed by the total enclosure of the tipping area. This area will also be placed under negative pressure with the air then being used in the combustion phase. The high temperatures then remove any potential for any emission of odor.

The primary source of noise during the operational phase is the movement of the solid waste delivery vehicles. Again the times available will be restricted allowing a break in the noise level thus reducing the nuisance potential.

The traffic patterns will be affected with the delivery of solid waste by vehicles. Also the arrival and departure of the shift workforce will have some impact. However, the majority of the impact will be during the normal rush hours of daylight.

Explosions or fires within the pit areas are minimized by the thorough training of the crane operators who manage the pit area. Any smoldering material can be loaded immediately into a combustion unit thus resolving the problem. Also, firehoses and sprinklers will be available. If explosive material were accidently fed into a combustion unit, any resulting explosion would be dissipated within the large volume of the boiler.

Vermin and rodent control of the pit area is accomplished by the enclosure of the pit area. The refuse is managed within the pit by the crane operator to minimizing any concentrations of food supplies. The refuse in the pit will be stored no more than three days before being combusted. This will eliminate vermin and rodent survivability.

APPENDIX

CLIMATOGRAPHY OF THE UNITED STATES NO. 90 (1965-1974)

AIRPORT CLIMATOLOGICAL SUMMARY

TAMPA, FLORIDA
INTERNATIONAL AIRPORT

DEPARTMENT OF COMMERCE • UNITED STATES OF AMERICA •

This Airport Climatological Summary (ACS) is intended mainly as an aid to aviation. Stations were selected from those airports for which Local Climatological Data (LCD) publications were prepared. Criteria for airport selection were principally the number of instrument approaches, and secondly geographic coverage of the United States. Stations which, during the 1965-74 period, underwent a significant move or had less than a full observation set on computer tape were not chosen. Depending on future funding and on the degree of demand for copies of the present ACS, additional LCD stations will be processed and existing summaries will be updated.

In many cases more detailed information with a longer period of record for Tables 1-8 may be obtained from the appropriate LCD (Annual) publication. The LCD may also furnish other climatological data, description of the local topography, and a discussion of the types of weather systems affecting the airport during a typical year.

CAPSULE SUMMARY OF AVIATION WEATHER

Flying Weather (Table 9): Ceiling less than 1500 feet and/or visibility less than 3 miles.

-- Month (all hours) with greatest percent frequency of occurrence: January (16.9%)

-- Month (all hours) with lowest percent frequency of occurrence: July (2.1%)

-- 3-hourly observation time (annual) with greatest percent frequency of occurrence: 0700 (18.3%)

-- 3-hourly observation time (annual) with lowest percent frequency of occurrence: 1600 (2.4%)

Ceiling, Visibility, and Weather by Wind Direction (Table 10 - Annual):

-- Percent frequency of ceilings over 9500 feet (10,000 feet or greater): 77.2%

-- Prevailing surface wind direction with ceiling over 9500 feet and percent frequency of occurrence: E (11.4%)

-- Percent frequency of visibilities over 6 miles (7 miles or greater): 86.7%

-- Prevailing surface wind direction with visibility over 6 miles and percent frequency of occurrence: E (12.2%)

Wind Direction vs. Wind Speed (Table 11 - Annual):

All Weather - Table A (percent frequency of all observations):

-- Prevailing wind direction: E (14.4%) wind speed (all directions) greater than 16 knots: 1.2%

IFR (Instrument Flight Rules) - Table B (percent frequency of IFR observations):

-- Prevailing wind direction: E (12.8%) wind speed (all directions) greater than 16 knots: 2.1%

(12.8% = percent frequency from E direction X 100% ÷ total IFR percent frequency)

Weather Condition by Hour (Table 12 - Annual):

-- Time of day with most obstructions to vision and mean number of days with visibility less than 7 miles at this hour: 0700 (137.0 days)

-- Time of day with least obstructions to vision and mean number of days with visibility less than 7 miles at this hour: 2200 (12.6 days)

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA SERVICE / NATIONAL CLIMATIC CENTER ASHEVILLE, N.C. AUGUST 1978

TABLE 10. CEILING, VISIBILITY, AND WEATHER BY WIND DIRECTION (PERCENT FREQUENCY OF OBSERVATIONS)

WIND DIR	CEILING (FEET) 0	100	200 TO 300	400 TO 900	1000 TO 1400	1500 TO 1900	2000 TO 2900	3000 TO 4900	5000 TO 9500	OVER 9500
N	.0	.0	.1	.2	.1	.1	.2	.4	.2	4.3
NNE	.0	.0	.1	.2	.1	.1	.2	.3	.3	3.9
NE	.0	.0	.1	.3	.1	.1	.2	.5	.5	5.3
ENE	.0	.0	.1	.2	.1	.1	.2	.7	.6	7.5
E	.0	.0	.1	.2	.1	.1	.4	1.2	.9	11.4
ESE	.0	.0	.0	.1	.1	.1	.2	.5	.5	5.5
SE	.0	.0	.0	.1	.0	.1	.2	.4	.4	4.0
SSE	.0	.0	.0	.1	.1	.1	.2	.3	.3	3.9
S	.1	.0	.1	.2	.1	.2	.2	.4	.5	3.4
SSW	.0	.0	.0	.1	.0	.1	.1	.2	.2	2.5
SW	.0	.0		.1	.0	.1	.2	.2	.2	2.1
WSW		.0	.0	.1	.1	.1	.2	.3	.2	2.9
W	.0	.0	.0	.1	.1	.2	.3	.6	.3	6.9
WNW	.0	.0	.0	.1	.1	.1	.2	.3	.2	2.9
NW	.0	.0	.0	.1	.1	.1	.2	.3	.2	3.5
NNW	.0	.0	.0	.1	.1	.1	.2	.3	.2	3.2
CALM	.0	.0	.0	.0	.0	.0	.0	.2	.1	4.0
TOT	.3	.3	.7	2.4	1.3	1.6	3.4	7.0	5.7	77.2

WIND DIR	VISIBILITY (MILES) 0 TO 3/16	1/4 TO 3/8	1/2 TO 3/4	1 TO 2 1/2	3 TO 6	OVER 6	WEATHER RAIN AND/OR DRZL	FRZ RAIN AND/OR FRZ DRZL	SNOW AND/OR IP	FOG	FOG AND SMOKE	SMOKE AND/OR HAZE	TSTM	HAIL
N	.0	.0	.0	.1	.5	4.9	.3			.3	.1	.3	.1	
NNE	.0	.0	.0	.2	.4	4.6	.3			.3	.0	.3	.1	
NE	.0	.0	.0	.2	.7	6.1	.3			.4	.2	.6	.1	
ENE	.1	.0	.0	.3	1.0	8.3	.4			.6	.2	.9	.1	
E	.1	.0	.0	.4	1.6	12.2	.6			.9	.3	1.5	.2	
ESE	.0	.0	.0	.3	1.0	5.7	.3			.5	.2	.9	.1	
SE	.0	.0	.0	.2	.7	4.1	.3			.4	.2	.7	.1	
SSE	.0	.0	.0	.2	.5	4.3	.4			.3	.1	.4	.2	
S	.0	.0	.0	.1	.5	4.5	.6			.3	.0	.2	.2	
SSW	.0	.0	.0	.0	.3	3.0	.2			.1	.0	.2	.1	
SW	.0	.0	.0	.0	.2	2.6	.2			.1	.0	.1	.1	
WSW	.0	.0	.0	.0	.2	3.5	.2			.1	.0	.2	.1	
W	.0	.0	.0	.1	.6	7.8	.3			.1	.0	.5	.3	
WNW	.0	.0	.0	.0	.2	3.5	.2			.1	.0	.2	.1	
NW	.0	.0	.0	.0	.3	4.3	.2			.1	.0	.2	.1	
NNW	.0	.0	.0	.1	.3	3.9	.2			.2	.0	.2	.1	
CALM	.1	.1	.1	.2	.7	3.4	.1			.7	.3	.6	.0	
TOT	.5	.3	.4	2.3	9.7	86.7	5.1			5.5	1.7	8.1	2.0	

IP = ICE PELLETS (REPLACES SLEET AND SMALL HAIL)

TABLE 11. WIND DIRECTION VS. WIND SPEED (PERCENT FREQUENCY OF OBSERVATIONS)

A. ALL WEATHER

WIND DIR	WIND SPEED (KNOTS) 0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	OVER 40	TOT	AVG SPEED
N	.4	2.1	2.1	.9	.1					5.8	7.4
NNE	.4	1.8	2.1	.9	.0					5.2	7.5
NE	.4	2.7	2.7	1.2	.0	.0				7.0	7.5
ENE	.7	4.1	3.5	1.3	.0	.0				9.7	7.1
E	1.0	6.2	5.0	2.1	.1	.0				14.4	7.2
ESE	.5	2.9	2.5	1.0	.0	.0			.0	7.0	7.2
SE	.4	1.9	2.1	.8	.0	.0				5.2	7.4
SSE	.4	1.9	[illegible]	.7	.0	.0	.0			5.1	7.5
S	.2	1.6	2.1	1.1	.1	.0	.0			5.2	8.3
SSW	.1	.9	1.5	.7	.1	.0				3.3	8.6
SW	.1	1.1	1.3	.4	.0	.0				2.9	7.6
WSW	.1	1.1	1.9	.6	.0					3.8	7.9
W	.3	1.7	4.2	2.3	.1	.0	.0			8.6	8.9
WNW	.2	1.2	1.2	1.0	.1	.0	.0			3.8	8.7
NW	.2	1.6	1.6	1.0	.2	.0	.0			4.7	8.4
NNW	.3	1.4	1.4	1.1	.2	.0				4.3	8.5
CALM	4.5									4.5	
TOT	10.2	34.3	37.3	16.9	1.1	.1	.0		.0	100.0	7.4

ALL WEATHER: ALL WIND OBSERVATIONS

B. IFR

WIND DIR	WIND SPEED (KNOTS) 0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	OVER 40	TOT	AVG SPEED
N	.0	.1	.1	.1	.0					.3	8.5
NNE	.0	.1	.2	.1						.4	7.8
NE	.0	.1	.2	.0	.0					.4	7.6
ENE	.0	.2	.2	.1		.0				.5	7.2
E	.1	.3	.2	.0	.0	.0				.6	6.4
ESE	.0	.2	.1	.0		.0			.0	.4	6.4
SE	.0	.1	.1	.0		.0				.3	6.5
SSE	.0	.1	.1	.0	.0		.0			.3	8.1
S	.0	.1	.1	.1	.0					.3	8.4
SSW		.0	.1	.0						.1	9.1
SW	.0	.0	.0	.0						.1	7.3
WSW	.0	.0	.0	.0						.1	7.8
W	.0	.1	.1	.0	.0	.0				.2	7.9
WNW	.0	.0	.0	.0	.0					.1	9.4
NW		.1	.0	.1						.2	8.9
NNW	.0	.0	.1	.0		.0				.2	9.0
CALM	.2									.2	
TOT	.6	1.7	1.6	.7	.1	.0	.0		.0	4.7	7.2

IFR: CEILING < 1000 FT AND/OR VISIBILITY < 3 MI BUT ≥ 200 FT AND ≥ 1/2 MI.

TABLE 12. WEATHER CONDITION BY HOUR (MEAN NO. OF DAYS)

	WEATHER CONDITIONS	HOUR (LST) 01	04	07	10	13	16	19	22
WEATHER TYPE	RAIN AND/OR DRIZZLE	11.6	12.4	14.1	16.3	21.2	26.3	27.8	18.2
	FRZ RAIN AND/OR FRZ DRIZZLE								
	SNOW AND/OR ICE PELLETS								
	HAIL								
	PRECIPITATION	11.6	12.4	14.1	16.3	21.2	26.3	27.8	18.2
	FOG	16.3	33.1	75.2	18.3	2.7	2.7	4.2	7.9
	FOG AND SMOKE	2.7	8.9	31.1	3.9	.3	.2	.4	1.7
	SMOKE AND/OR HAZE	9.7	26.2	94.5	57.7	18.7	12.6	11.7	6.6
	OBSTRUCTIONS TO VISION	23.3	50.2	137.0	71.8	21.1	15.0	15.3	12.8
	THUNDERSTORM	1.2	1.9	2.7	4.5	12.0	16.3	15.9	3.9
WIND SPEED (KNOTS)	CALM	33.2	33.3	29.5	1.6	.8	.7	6.0	25.1
	1 – 6	205.4	217.7	204.1	94.2	55.2	49.5	149.7	195.5
	7 – 10	101.5	90.6	107.2	167.2	184.1	170.8	159.0	110.1
	11 – 16	22.8	21.3	22.1	95.9	115.4	135.5	47.0	32.3
	17 – 21	1.8	1.9	2.0	5.8	8.7	7.7	2.6	1.6
	22 – 27	.4	.4	.1	.3	.7	.8	.6	.4
	28 – 33			.2	.1	.3	.2	.2	
	OVER 33	.1							
VISIBILITY (MILES)	0 – 3/16	1.8	3.9	6.7	.5				.7
	1/4 – 3/8	1.5	2.2	3.5	.4	.2	.1	.1	1.0
	1/2 – 3/4	.9	2.2	5.6	1.9	.3	.3	.6	.6
	1 – 2 1/2	2.9	6.3	33.0	16.2	3.1	3.9	3.5	1.1
	3 – 6	10.7	25.7	66.6	37.0	14.4	10.5	10.8	8.9
	OVER 6	347.4	324.9	249.8	311.1	347.2	350.4	350.1	352.7
TEMPERATURE (°F)	ZERO OR LOWER								
	1 – 32	.8	1.3	2.2				.1	.5
	33 – 44	16.3	20.8	24.1	3.6	.7	.5	4.7	11.2
	45 – 64	112.6	125.6	124.2	64.7	32.4	30.6	69.7	97.8
	65 – 89	235.5	217.7	214.7	295.9	301.1	301.7	290.4	255.5
	90 – 99				.9	31.0	32.4	.2	
	OVER 99								

VALUES ARE ROUNDED TO NEAREST TENTH, BUT NOT ADJUSTED TO MAKE THEIR SUMS EXACTLY EQUAL TO COLUMN OR ROW TOTALS.

THESE VALUES ARE BASED ON 3—HOURLY OBSERVATIONS.

Administrator did not intend to require BACT. For example, the proposal could be interpreted as requiring BACT review for any pollutant emitted from a source that was modified, regardless of whether the emissions of the pollutant increased. However, that was not the Agency's intent.

If a new unit were added or if a modification were made to a unit at a source, but there are contemporaneous decreases in emissions elsewhere at the source, BACT is required only for the pollutants for which there is a net significant plant-wide increase. For example, consider the addition of a boiler whose emissions of PM, SO_2, and NO_x each exceed *de minimis* levels. If, at the same time, an emission unit of SO_2 elsewhere at the source were shut down, such that plant-wide emissions of SO_2 either do not increase or increase by less than a *de minimis* amount, BACT is required for the new boiler only for PM and NO_x. Of course, BACT will not be required if there is no significant plant-wide increase in emissions of any pollutant. Similarly, if an existing emissions unit of a source were modified such that there is an emissions increase for one or more pollutants, but not all, BACT is required only for the pollutants for which there is both a net increase at the unit and a net significant plant-wide increase.

The above final policy governing the applicability of BACT to modifications is also consistent with existing policy under section 111, which the court said should govern modification concerns. The applicable regulation, 40 CFR 60.14(a), states that "any physical or operational change to an existing facility which results in an increase in the emissions rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Upon modification, an existing facility shall become an affected facility *for each pollutant to which a standard applies and for which there is an increase in the emissions rate* to the atmosphere." (Emphasis added.)

The regulation cited above makes two important statements about the applicability requirements. First, the BACT requirements apply only with regard to those pollutants for which there has been a net significant increase. This was emphasized by the Alabama Power decision: "Congress wished to apply the permit process, then only where industrial changes might increase pollution in an area, not where an existing plant changed its operations in ways that produced no pollution increase * * *. The interpretation of 'modification' as requiring a net increase is thus consistent with the purpose of the Act * * *. The EPA has properly exempted from best available control technology (BACT) and ambient air quality review those 'modifications' of a source that do not produce a net increase in any pollutant." 13 ERC at 2043.

Second, BACT is required for net significant increases of *any* pollutant regulated under the Act, regardless of the category of source involved or the emissions standards generally applicable to it. Section 165(a)(4) of the Act requires application of BACT "for each pollutant subject to regulation under this Act" emitted from a subject facility. 42 U.S.C. 7475(a)(4). This includes not only criteria pollutants but also all pollutants regulated under NSPS or NESHAP. In this manner, BACT can complement the NSPS process by extending coverage to additional source types and units and perhaps identifying candidates for future NSPS and NESHAP regulations.

XVI. Monitoring

In *Alabama Power,* the court held that section 165(e)(1) of the Act requires an ambient air quality analysis for each pollutant subject to regulation under the Act that a proposed source or modification would emit, prior to applying for a PSD permit. Since existing PSD regulations require monitoring only for criteria pollutants emitted in major amounts, EPA responded to the June 18, 1979 *per curiam* opinion by proposing to require, for criteria and noncriteria pollutants, an air quality analysis that would generally include monitoring data. In order to gather and analyze the appropriate data necessary to apply for a PSD permit, a proposed source would have to establish an appropriate monitoring network or would have to gather and analyze representative air monitoring data resulting from ongoing monitoring activities.

As proposed, preconstruction monitoring data was required as part of the air quality analysis when: (1) the estimated ambient impact of any new pollutant emissions from the stationary source or modification would be larger than the pollutant specific *de minimis* air quality concentration (Table B); or (2) the new emissions or net emissions increases for the pollutant would be major (100/250 tons per year). In addition to this rule, EPA proposed that a case-by-case analysis of the proposed stationary source or modification which would impact on a Class I area be conducted even though the anticipated impact would fall below the *de minimis* level. Later, in October 1979, EPA provided further guidance for applying these requirements in the draft revision of the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD),* OAQPS 1.2–096, U.S. EPA, Office of Air Quality Planning and Standards and Office of Research and Development, RTP, NC 27711.

The proposal stated that certain noncriteria pollutants (sulfuric acid mist, carbon disulfide, carbonyl sulfide, methyl mercaptan, dimethyl disulfide, and dimethyl sulfide) were lacking measurement methods approved by EPA. Until such time as approved techniques would become available, the Agency proposed to use mathematical modeling to estimate the air quality resulting from the emissions of these pollutants. Considering these limitations and the general lack of experience in monitoring on a routine basis, the Administrator proposed to implement noncriteria pollutant monitoring requirements on a case-by-case basis.

In addition to the pre-application monitoring requirements already described, EPA's proposal included discretionary authority for requiring post-construction monitoring to determine the effects of the new emissions on existing air quality. For cases in which larger pollutant emission impacts are anticipated, post-construction monitoring can be a particularly useful aid in adjusting modeling results used to predict concentrations resulting from the source's operation. The approach was thought to be responsive to the *Alabama Power* decision which required EPA to use monitors to help refine modeling techniques. Accordingly, EPA proposed to generally require post-construction monitoring from large sources of particulate matter and sulfur dioxide. Other sources whose emissions are estimated to result in air quality levels approaching an allowable increment or a NAAQS could also be required to submit post-construction monitoring data. The rule promulgated today is consistent with the proposal.

The Administrator believed that the required monitoring data would be most productive in checking the accuracy of models and, in some cases, could be used to calculate increment consumption. If an applicant or other party believes that a model required by EPA had either overpredicted or underpredicted the air quality impact of a source, EPA stated that monitoring data would be evaluated to the extent possible to determine whether adjustments would be necessary. EPA anticipated that the future development of more sophisticated monitoring techniques may permit increased use of monitoring data to track increment consumption and establish ambient baselines, as well as improve the level of confidence in modeling.

Lastly, EPA considered the approach needed to smoothly usher in the new monitoring requirements. The September 5 **Federal Register** indicated that EPA intended to require any additional monitoring requirements, as now necessary under *Alabama Power*, to be phased in. Later, in October 1979, the draft ambient monitoring guidelines specified that a three-month allowance would be subtracted from the time interval over which the owner must monitor to allow for procuring and setting up the necessary monitoring equipment. (*See* Transition).

There was a large response to EPA's proposal and draft monitoring guidelines—nearly 100 public comments and over 800 requests for the guidance document were received. The comments indicated general agreement with EPA's interpretation of the court's preliminary opinion. But some concern was expressed over certain specific portions of the proposal: (1) the limited technology available to monitor the noncriteria pollutants in the ambient air; (2) the large cost associated with gathering all the required air quality data for all regulated pollutants; (3) the identification process for "representative" data; and (4) the need for post-construction monitoring.

Subsequent to the publication of the September 5, 1979 proposal and the receipt of the public comment, the court issued its final decision on December 14, 1979. One important change the court made upon reconsideration of the June 18 opinion was "that section 165(e)(1) requires that *an analysis* be conducted, and that it be conducted for each pollutant regulated under the Act. But * * * that section 165(e)(1), standing alone does not require monitoring as *the* method of analysis to be employed in the fulfillment of its requirements." 13 ERC 1993, 2019. This ruling gave EPA more flexibility in defining the minimum requirements for a proper analysis of the noncriteria pollutants. "EPA might * * * choose *either* monitoring or modeling as the method of analysis * * *" *Id.* In other monitoring issues the court essentially affirmed its preliminary opinions.

Today, the Administrator is promulgating the proposed monitoring requirements with the noted exceptions. (*See* 40 CFR 51.24(m), 52.21(m)). EPA will generally require one year's worth of monitoring data as part of the air quality analysis for only the criteria pollutants. For the noncriteria and hazardous pollutants, modeling, not monitoring, will be the mechanism used to perform most detailed air quality analyses. However, there may be certain circumstances where monitoring may be the only option available to perform an adequate analysis for the noncriteria pollutants (e.g., when little or no data on emission inventories for the area of concern exist). In that case, EPA will require ambient monitoring for the noncriteria pollutants if there is an acceptable method for the monitoring of that pollutant. Presently, the Administrator has acceptable methods for measuring ambient concentrations of: (1) all the criteria pollutants; (2) mercury; (3) beryllium; (4) vinyl chloride; (5) fluorides; and (6) hydrogen sulfide. A list of acceptable methods and copies of the method description are available by writing to: U.S. EPA, Environmental Monitoring Systems Laboratory, Quality Assurance Division (MD-77), Research Triangle Park, N.C. 27711. Also, techniques to measure ambient total reduced sulfur and reduced sulfur compounds have been chosen and will be added to the list within the next several months. At this time there are no acceptable methods for measuring ambient levels of asbestos and sulfuric acid mist.

As EPA gains more experience from the PSD program with respect to noncriteria pollutant analysis and as the technology develops, the Administrator will consider an increased role for ambient monitoring within the required air quality analysis.

In addition to the exemptions given in the *de minimis* section of this **Federal Register** publication, EPA may not always require a source owner to establish a monitoring network when the data would not validate or improve the estimates made by the mathematical models. When the existing air pollution levels are conservatively estimated to be quite small and a monitoring network could not reliably measure the predicted background concentrations, EPA will generally not require the source owner to generate preconstruction monitoring data. Also, if the source owner has submitted preconstruction data for the source site, and the post-construction monitoring network could not measure a predicted degradation in the air quality, then EPA will generally not require the source owner to collect further monitoring data. More guidance for meeting all the monitoring requirements is given in the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (PSD), EPA-450/4-80-012, July 1980, available from the Monitoring and Data Analysis Division, OAQPS, (MD-14), U.S. EPA, Research Triangle Park, N.C. 27711.

In the September 5, 1979 proposed regulations and the October 1979 draft of *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (PSD), EPA solicited comments on the use of representative air quality data to satisfy PSD monitoring requirements. Thirty-nine comments were received on the various aspects of the use of representative air quality data. The major responses were as follows: twenty-four commenters supported the use of existing representative air quality data, especially for remote areas. Five commenters wanted EPA to allow the use of bubbler data in lieu of continuous monitoring data, seven respondents believed that data older than two years should be allowed, and three objected to the quality assurance requirements for the representative data.

EPA has considered all of the comments and has taken the following actions:

(1) The use of existing representative air quality data will be permitted in lieu of monitoring, provided that the data meet the criteria in the above reference guideline.

(2) No bubbler data will be permitted because the data should be of the same quality as that obtained if the applicant monitored according to the requirements in the above referenced guideline. This guideline specifies monitoring must be done with continuous instruments to eliminate measurement biases associated with bubbler data. Continuous measurements are also more suitable for routine monitoring purposes in checking for compliance with short-term standards.

(3) EPA will allow the use of data, for preconstruction purposes only, collected in the three-year period preceding the permit application provided reference/equivalent quality assurance procedures were followed during the measurement period. The draft guideline has previously specified a two-year requirement.

(4) EPA reaffirms the intent that all monitoring data collected must have been collected in accordance with acceptable quality assurance procedures. The specifics of the minimum quality assurance program needed for collecting air quality data are contained in the referenced guideline.

Finally, the court held that EPA had failed to provide concrete guidance to the states for designating when less than one year of monitoring data would meet the required air quality analysis, as specifically allowed under section 165(e)(2). Such guidance is given under

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PLANT NAME: HILLSBOROUGH 1000 TPD    POLLUTANT: 1G/S    EMISSION UNITS: GM/SEC    AIR QUALITY UNITS: GM/M**3
 HILLSBOROUGH 1000 TPD    BASIS RUN    EMISSION RATE = 1.00 G/S
 CRSTER RUN OF 1000 TPD FACILITY IN TAMPA,FLORIDA.
 BASED ON 1974 METEROLOGICAL DATA.
 RUN BY EASEL ROBERTS AND DAVID MOLEK.

             MET FILE       REQUESTED
           STN NO. YR     STN NO. YR
 SURFACE     12842  74     12842  74
 UPPER AIR   12842  74     12842  74
PLANT LOCATION: URBAN
NO_TAPE_OUTPUT
MET DATA WILL NOT BE PRINTED

DAY--  1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
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       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
       1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

 * * * * * * * * * * * * * * * * * * * * N O T E * * * * * * * * * * * * * * * * * * * *

        ALL TABLES, INCLUDING SOURCE CONTRIBUTION, THAT CONTAIN #ANNUAL# IN THE HEADING ARE BASED ONLY ON THOSE DAYS

        MARKED BY #1# IN THE ABOVE TABLE
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RING DISTANCES(KM)= 1.00 1.25 1.60 2.30 3.80

PLANT ELEVATION (FEET ABOVE SEA LEVEL)-- 0.0 PLANT ELEVATION (METERS ABOVE SEA LEVEL)-- 0.0

	RECEPTOR ELEVATIONS (FEET ABOVE SEA LEVEL)					RECEPTOR ELEVATIONS (METERS ABOVE SEA LEVEL)				
DIRECTION	RING#1	RING#2	RING#3	RING#4	RING#5	RING#1	RING#2	RING#3	RING#4	RING#5
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STACK # 1-- STACK 1
STACK # 2-- STACK 2
STACK # 3-- STACK 3
STACK # 4-- STACK 4

STACK	MONTH	EMISSION RATE (GMS/SEC)	HEIGHT (METERS)	DIAMETER (METERS)	EXIT VELOCITY (M/SEC)	TEMP (DEG.K)	VOLUMETRIC FLOW (M**3/SEC)
1	ALL	1.0000	45.72	1.35	21.30	500.00	30.49
2	ALL	1.0000	45.72	1.35	21.30	500.00	30.49
3	ALL	1.0000	45.72	1.35	21.30	500.00	30.49
4	ALL	1.0000	45.72	1.35	21.30	500.00	30.49
		4.0	45.72	2.7 Diameter	21.3	500	122

Pi May

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

MAXIMUM MEAN CONC= 6.7870E-07 DIRECTION= 27 DISTANCE= 1.0 KM

ANNUAL MEAN CONCENTRATION AT EACH RECEPTOR

RANGE / DIR	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	2.79258E-07	2.26904E-07	1.75176E-07	1.14771E-07	6.11747E-08
2	2.45647E-07	1.91529E-07	1.41636E-07	8.76360E-08	4.35945E-08
3	2.05392E-07	1.57555E-07	1.14606E-07	6.95379E-08	3.40932E-08
4	1.98931E-07	1.53311E-07	1.12281E-07	6.89499E-08	3.44965E-08
5	2.19984E-07	1.67886E-07	1.21774E-07	7.38591E-08	3.63786E-08
6	2.63282E-07	2.00929E-07	1.46127E-07	8.92909E-08	4.45571E-08
7	3.05483E-07	2.31315E-07	1.66679E-07	1.00250E-07	4.86358E-08
8	3.75009E-07	2.85882E-07	2.07488E-07	1.25956E-07	6.16820E-08
9	4.66896E-07	3.65380E-07	2.72920E-07	1.72540E-07	8.88384E-08
10	4.11859E-07	3.20258E-07	2.37011E-07	1.47475E-07	7.42537E-08
11	3.03290E-07	2.39157E-07	1.78882E-07	1.11969E-07	5.58881E-08
12	2.61255E-07	2.16918E-07	1.70077E-07	1.11880E-07	5.80127E-08
13	2.87997E-07	2.53283E-07	2.09563E-07	1.46877E-07	8.14387E-08
14	3.13562E-07	2.78504E-07	2.31758E-07	1.62805E-07	8.98237E-08
15	3.17875E-07	2.83995E-07	2.37945E-07	1.68908E-07	9.46523E-08
16	2.90291E-07	2.57085E-07	2.14286E-07	1.51440E-07	8.44047E-08
17	2.69329E-07	2.36229E-07	1.95536E-07	1.37514E-07	7.65561E-08
18	2.79361E-07	2.45757E-07	2.03817E-07	1.44506E-07	8.26838E-08
19	2.46836E-07	2.05449E-07	1.60378E-07	1.04390E-07	5.34874E-08
20	3.14365E-07	2.67336E-07	2.13836E-07	1.44285E-07	7.77070E-08
21	4.41812E-07	3.91569E-07	3.26644E-07	2.32779E-07	1.33919E-07
22	4.89786E-07	4.26993E-07	3.49720E-07	2.42633E-07	1.34302E-07
23	5.10996E-07	4.46023E-07	3.65545E-07	2.53630E-07	1.40305E-07
24	6.14455E-07	5.52981E-07	4.65339E-07	3.32278E-07	1.88874E-07
25	6.71660E-07	6.12106E-07	5.20545E-07	3.76557E-07	2.18245E-07
26	6.22610E-07	5.62632E-07	4.73078E-07	3.34870E-07	1.86481E-07
27	6.78704E-07	6.23951E-07	5.34952E-07	3.89867E-07	2.26549E-07
28	6.29051E-07	5.65957E-07	4.74895E-07	3.36122E-07	1.87588E-07
29	5.45396E-07	4.85950E-07	4.04651E-07	2.84685E-07	1.58738E-07
30	5.05309E-07	4.48478E-07	3.72948E-07	2.63072E-07	1.47984E-07
31	4.62452E-07	3.98228E-07	3.22348E-07	2.20233E-07	1.19435E-07
32	4.33308E-07	3.67418E-07	2.94139E-07	1.99163E-07	1.07705E-07
33	4.07566E-07	3.44082E-07	2.74855E-07	1.86186E-07	1.01142E-07
34	3.60664E-07	3.04664E-07	2.43493E-07	1.65073E-07	8.98710E-08
35	3.04971E-07	2.59406E-07	2.08362E-07	1.41713E-07	7.70195E-08
36	2.79779E-07	2.31821E-07	1.81352E-07	1.19600E-07	6.33839E-08

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

YEARLY MAXIMUM 24-HOUR CONC= 5.2083E-06 DIRECTION= 8 DISTANCE= 1.3 KM DAY=168

HIGHEST 24-HOUR CONCENTRATION AT EACH RECEPTOR

RANGE / DIR	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	3.0834E-06 (79)	2.8632E-06 (79)	2.8885E-06 (43)	2.5776E-06 (43)	1.7774E-06 (43)
2	2.9519E-06 (83)	2.3366E-06 (83)	1.7423E-06 (83)	1.0908E-06 (83)	5.6300E-07 (83)
3	2.4223E-06 (83)	1.9604E-06 (31)	1.6352E-06 (31)	1.1573E-06 (31)	6.5627E-07 (31)
4	2.3610E-06 (80)	1.8093E-06 (80)	1.3306E-06 (31)	9.7821E-07 (12)	6.5871E-07 (155)
5	2.2899E-06 (88)	1.8047E-06 (88)	1.3501E-06 (88)	9.7155E-07 (30)	5.4838E-07 (30)
6	3.4200E-06 (309)	3.7539E-06 (309)	3.6962E-06 (309)	3.0835E-06 (309)	2.0053E-06 (309)
7	2.8616E-06 (88)	2.0528E-06 (88)	1.6010E-06 (84)	1.3946E-06 (84)	9.2065E-07 (84)
8	4.8183E-06 (168)	5.2083E-06 (168)	5.1248E-06 (168)	4.3077E-06 (168)	2.8260E-06 (168)
9	4.1115E-06 (230)	3.6134E-06 (230)	3.2576E-06 (272)	2.6721E-06 (337)	1.7839E-06 (337)
10	4.1727E-06 (230)	3.9060E-06 (230)	3.3930E-06 (230)	2.4846E-06 (230)	1.4066E-06 (230)
11	2.4101E-06 (113)	2.6224E-06 (113)	2.5361E-06 (113)	2.0321E-06 (113)	1.2144E-06 (113)
12	2.3332E-06 (112)	2.7509E-06 (112)	2.8181E-06 (112)	2.4123E-06 (112)	1.5766E-06 (112)
13	2.6019E-06 (337)	2.7739E-06 (364)	3.0289E-06 (364)	2.8128E-06 (364)	2.0278E-06 (364)
14	3.1249E-06 (107)	3.1368E-06 (107)	2.9186E-06 (107)	2.3435E-06 (107)	1.4924E-06 (107)
15	3.3235E-06 (40)	2.5170E-06 (162)	2.5757E-06 (162)	2.2330E-06 (162)	1.5155E-06 (162)
16	2.4995E-06 (17)	2.8689E-06 (124)	3.0744E-06 (124)	2.7863E-06 (124)	1.9538E-06 (124)
17	3.3842E-06 (350)	2.9226E-06 (77)	3.1055E-06 (77)	2.7983E-06 (77)	1.9389E-06 (77)
18	3.3324E-06 (280)	3.4956E-06 (338)	3.4480E-06 (338)	3.0620E-06 (338)	2.2755E-06 (338)
19	2.4658E-06 (57)	1.9853E-06 (338)	1.8085E-06 (338)	1.3990E-06 (338)	8.4863E-07 (338)
20	2.8840E-06 (311)	2.5591E-06 (317)	2.1682E-06 (317)	1.5654E-06 (317)	9.0509E-07 (317)
21	2.9828E-06 (274)	3.0078E-06 (121)	3.2016E-06 (121)	2.9209E-06 (121)	2.1037E-06 (121)
22	4.0458E-06 (312)	3.3323E-06 (312)	2.6596E-06 (59)	2.1003E-06 (237)	1.3964E-06 (237)
23	3.1317E-06 (266)	2.5979E-06 (258)	2.6545E-06 (77)	2.4062E-06 (77)	1.7583E-06 (77)
24	3.8681E-06 (348)	2.9538E-06 (348)	2.4591E-06 (285)	1.7814E-06 (282)	1.1509E-06 (308)
25	3.9809E-06 (8)	3.9103E-06 (340)	3.7128E-06 (340)	3.4876E-06 (61)	2.6991E-06 (61)
26	2.9480E-06 (356)	2.8203E-06 (118)	2.6535E-06 (118)	2.1643E-06 (118)	1.4619E-06 (118)
27	3.5486E-06 (198)	4.2983E-06 (198)	4.5024E-06 (198)	3.9404E-06 (198)	2.6337E-06 (198)
28	3.8723E-06 (140)	3.5961E-06 (118)	3.1906E-06 (118)	2.4084E-06 (118)	1.4556E-06 (118)
29	3.0576E-06 (140)	2.6631E-06 (197)	2.9611E-06 (197)	2.7660E-06 (197)	1.9647E-06 (197)
30	2.8664E-06 (102)	2.5856E-06 (102)	2.5446E-06 (261)	2.1056E-06 (261)	1.3292E-06 (261)
31	2.7738E-06 (142)	2.3561E-06 (142)	1.8799E-06 (142)	1.5328E-06 (150)	1.0432E-06 (120)
32	2.7932E-06 (142)	2.5750E-06 (229)	2.4657E-06 (123)	2.1607E-06 (123)	1.4081E-06 (123)
33	2.6829E-06 (213)	2.1812E-06 (213)	1.9867E-06 (206)	1.5596E-06 (205)	9.6826E-07 (165)
34	3.1451E-06 (213)	3.5311E-06 (46)	3.5725E-06 (46)	3.0465E-06 (46)	2.0658E-06 (46)
35	2.5417E-06 (208)	2.8400E-06 (157)	2.9514E-06 (157)	2.5462E-06 (157)	1.6615E-06 (157)
36	3.6108E-06 (175)	2.7188E-06 (175)	2.2776E-06 (27)	1.9676E-06 (27)	1.3777E-06 (27)

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

YEARLY SECOND MAXIMUM 24-HOUR CONC= 3.8410E-06 DIRECTION= 22 DISTANCE= 1.0 KM DAY=313

SECOND HIGHEST 24-HOUR CONCENTRATION AT EACH RECEPTOR

RANGE / DIR	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	2.9878E-06 (175)	2.7206E-06 (43)	2.4694E-06 (79)	1.9252E-06 (44)	1.3970E-06 (44)
2	2.0930E-06 (38)	1.6773E-06 (79)	1.3168E-06 (79)	8.6781E-07 (91)	4.5915E-07 (28)
3	2.1880E-06 (31)	1.8638E-06 (83)	1.3822E-06 (38)	9.6784E-07 (91)	5.5804E-07 (91)
4	2.0587E-06 (31)	1.7302E-06 (31)	1.3211E-06 (80)	9.6989E-07 (155)	6.4864E-07 (12)
5	1.8236E-06 (80)	1.4392E-06 (90)	1.2896E-06 (30)	8.4874E-07 (88)	4.3986E-07 (90)
6	2.9593E-06 (88)	2.1403E-06 (88)	1.4573E-06 (88)	9.1672E-07 (270)	5.5637E-07 (32)
7	2.0944E-06 (168)	1.8546E-06 (168)	1.5007E-06 (168)	1.1138E-06 (24)	7.3112E-07 (24)
8	2.8111E-06 (147)	2.1364E-06 (45)	2.1205E-06 (45)	1.7718E-06 (45)	1.1335E-06 (45)
9	3.7763E-06 (192)	3.5522E-06 (272)	3.0723E-06 (337)	2.5907E-06 (272)	1.6612E-06 (272)
10	3.2764E-06 (192)	2.5562E-06 (192)	2.1466E-06 (179)	1.8506E-06 (179)	1.3216E-06 (179)
11	2.3137E-06 (193)	1.6898E-06 (193)	1.6898E-06 (236)	1.4675E-06 (236)	9.8090E-07 (236)
12	2.2666E-06 (335)	1.7038E-06 (335)	1.5774E-06 (325)	1.2921E-06 (325)	8.0569E-07 (325)
13	2.5810E-06 (99)	2.5186E-06 (99)	2.2898E-06 (99)	1.8510E-06 (315)	1.1984E-06 (315)
14	2.8143E-06 (40)	2.0565E-06 (76)	1.7573E-06 (123)	1.5127E-06 (207)	1.0305E-06 (207)
15	2.6130E-06 (56)	2.4780E-06 (40)	2.1771E-06 (69)	1.8709E-06 (69)	1.2928E-06 (69)
16	2.4352E-06 (40)	2.7142E-06 (362)	2.8371E-06 (362)	2.4850E-06 (362)	1.6822E-06 (362)
17	2.7151E-06 (280)	2.6702E-06 (350)	1.9696E-06 (350)	1.3395E-06 (323)	8.8601E-07 (323)
18	3.3079E-06 (338)	2.8835E-06 (325)	2.7161E-06 (325)	2.1859E-06 (325)	1.4204E-06 (325)
19	2.3620E-06 (311)	1.8743E-06 (57)	1.7175E-06 (325)	1.3291E-06 (325)	8.1733E-07 (325)
20	2.8274E-06 (317)	2.3353E-06 (311)	1.7991E-06 (311)	1.3255E-06 (344)	8.2735E-07 (344)
21	2.9210E-06 (313)	2.7058E-06 (59)	2.6861E-06 (59)	2.2236E-06 (59)	1.3865E-06 (59)
22	3.8410E-06 (313)	3.0959E-06 (313)	2.6209E-06 (312)	2.0123E-06 (59)	1.2414E-06 (60)
23	3.0486E-06 (267)	2.5458E-06 (77)	2.4718E-06 (258)	2.1044E-06 (27)	1.5979E-06 (27)
24	3.2434E-06 (285)	2.9316E-06 (285)	2.3160E-06 (264)	1.7262E-06 (285)	1.1021E-06 (288)
25	3.7369E-06 (340)	3.6780E-06 (8)	3.6704E-06 (61)	3.0057E-06 (340)	1.9658E-06 (340)
26	2.8360E-06 (340)	2.7813E-06 (340)	2.4892E-06 (340)	1.8654E-06 (340)	1.0998E-06 (340)
27	3.2242E-06 (356)	3.4437E-06 (355)	3.4234E-06 (355)	2.8856E-06 (355)	1.8953E-06 (355)
28	3.7743E-06 (118)	3.3296E-06 (2)	2.7561E-06 (2)	1.9578E-06 (205)	1.2917E-06 (44)
29	2.8737E-06 (74)	2.6263E-06 (64)	2.5868E-06 (64)	2.2003E-06 (64)	1.5658E-06 (64)
30	2.6342E-06 (184)	2.5645E-06 (261)	2.1981E-06 (102)	1.6822E-06 (2)	1.1173E-06 (2)
31	2.5884E-06 (136)	2.1236E-06 (136)	1.7669E-06 (150)	1.2907E-06 (120)	1.0336E-06 (150)
32	2.4453E-06 (229)	2.3265E-06 (123)	2.4154E-06 (229)	1.8965E-06 (229)	1.1522E-06 (229)
33	2.1542E-06 (131)	2.1305E-06 (206)	1.8568E-06 (165)	1.5210E-06 (165)	9.6080E-07 (206)
34	3.0751E-06 (46)	2.7821E-06 (213)	2.3175E-06 (213)	1.6470E-06 (213)	9.6074E-07 (14)
35	2.3498E-06 (157)	2.6139E-06 (173)	2.7454E-06 (173)	2.4212E-06 (173)	1.6511E-06 (173)
36	2.6127E-06 (341)	2.3082E-06 (27)	1.9676E-06 (175)	1.2503E-06 (175)	7.2728E-07 (175)

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

YEARLY MAXIMUM   3-HOUR CONC= 2.5182E-05 DIRECTION= 34 DISTANCE= 1.6 KM DAY= 46 TIME PERIOD= 1

HIGHEST 3-HOUR CONCENTRATION AT EACH RECEPTOR

RANGE / DIR	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	1.3972E-05 (43, 8)	1.7553E-05 (43, 8)	1.8946E-05 (43, 8)	1.7152E-05 (43, 8)	1.1955E-05 (43, 8)
2	7.7443E-06 (31, 4)	6.1752E-06 (46, 6)	6.4084E-06 (44, 1)	5.2111E-06 (44, 1)	2.8159E-06 (44, 1)
3	7.0972E-06 (39, 2)	6.3908E-06 (11, 7)	6.2447E-06 (11, 7)	5.1757E-06 (11, 7)	3.4192E-06 (11, 7)
4	7.7553E-06 (346, 6)	8.8663E-06 (12, 1)	9.0843E-06 (12, 1)	7.8079E-06 (12, 1)	5.2656E-06 (155, 1)
5	7.0706E-06 (19, 6)	7.1235E-06 (272, 1)	6.7636E-06 (30, 8)	5.5051E-06 (30, 8)	3.3788E-06 (30, 8)
6	1.3007E-05 (309, 8)	1.5887E-05 (309, 8)	1.6746E-05 (309, 8)	1.4848E-05 (309, 8)	1.0219E-05 (309, 8)
7	7.9884E-06 (24, 7)	9.2912E-06 (24, 7)	9.4675E-06 (24, 7)	8.1733E-06 (24, 7)	5.5668E-06 (24, 7)
8	1.1130E-05 (168, 1)	1.3315E-05 (168, 2)	1.3820E-05 (168, 2)	1.1896E-05 (168, 2)	7.7215E-06 (168, 2)
9	1.2027E-05 (337, 7)	1.4361E-05 (337, 7)	1.4870E-05 (337, 7)	1.2936E-05 (337, 7)	8.7120E-06 (337, 7)
10	1.2167E-05 (179, 8)	1.4601E-05 (179, 8)	1.5319E-05 (179, 8)	1.3859E-05 (179, 8)	1.0159E-05 (179, 8)
11	1.1106E-05 (113, 8)	1.3111E-05 (113, 8)	1.3398E-05 (113, 8)	1.1396E-05 (113, 8)	7.3510E-06 (113, 8)
12	1.1875E-05 (112, 8)	1.4416E-05 (112, 8)	1.5067E-05 (112, 8)	1.3134E-05 (112, 8)	8.7236E-06 (112, 8)
13	1.1171E-05 (364, 2)	1.4302E-05 (364, 2)	1.5895E-05 (364, 2)	1.4938E-05 (364, 2)	1.0874E-05 (364, 2)
14	1.1617E-05 (107, 8)	1.4132E-05 (107, 8)	1.4872E-05 (107, 8)	1.3241E-05 (107, 8)	9.1417E-06 (107, 8)
15	1.3131E-05 (162, 8)	1.6016E-05 (162, 8)	1.6864E-05 (162, 8)	1.4937E-05 (162, 8)	1.0268E-05 (162, 8)
16	1.2423E-05 (362, 2)	1.5149E-05 (362, 2)	1.5925E-05 (362, 2)	1.4033E-05 (362, 2)	9.5362E-06 (362, 2)
17	1.0294E-05 (355, 6)	1.0088E-05 (77, 1)	1.0840E-05 (77, 1)	9.8495E-06 (77, 1)	6.7629E-06 (77, 1)
18	1.0661E-05 (338, 1)	1.3014E-05 (338, 1)	1.4228E-05 (338, 1)	1.3826E-05 (338, 1)	1.0843E-05 (338, 1)
19	7.0266E-06 (325, 3)	7.3367E-06 (365, 8)	7.0097E-06 (365, 8)	5.3523E-06 (365, 8)	3.3432E-06 (325, 3)
20	7.7079E-06 (311, 3)	9.2574E-06 (204, 1)	9.6441E-06 (204, 1)	8.4321E-06 (204, 1)	5.7360E-06 (204, 1)
21	1.3013E-05 (59, 8)	1.6028E-05 (59, 8)	1.6880E-05 (59, 8)	1.4681E-05 (59, 8)	9.5749E-06 (59, 8)
22	1.0705E-05 (100, 2)	1.1933E-05 (100, 2)	1.1705E-05 (100, 2)	1.0080E-05 (237, 8)	7.2375E-06 (60, 2)
23	1.3242E-05 (343, 1)	1.6243E-05 (343, 1)	1.7198E-05 (343, 1)	1.5351E-05 (343, 1)	1.0686E-05 (343, 1)
24	1.0805E-05 (124, 8)	1.2710E-05 (124, 8)	1.2941E-05 (124, 8)	1.1162E-05 (308, 1)	8.1747E-06 (308, 1)
25	1.1960E-05 (61, 2)	1.4901E-05 (61, 2)	1.6594E-05 (61, 2)	1.6400E-05 (61, 2)	1.3067E-05 (61, 2)
26	9.4406E-06 (365, 2)	1.0491E-05 (365, 2)	1.0266E-05 (5, 1)	9.3625E-06 (5, 1)	6.4843E-06 (5, 1)
27	1.2507E-05 (198, 2)	1.5225E-05 (198, 2)	1.5982E-05 (198, 2)	1.4065E-05 (198, 2)	1.0550E-05 (122, 1)
28	9.8001E-06 (118, 2)	1.1278E-05 (118, 2)	1.1272E-05 (118, 2)	9.3977E-06 (118, 2)	6.2673E-06 (44, 2)
29	1.1470E-05 (200, 8)	1.4173E-05 (197, 2)	1.5400E-05 (197, 2)	1.4239E-05 (197, 2)	1.0899E-05 (120, 1)
30	9.9394E-06 (261, 2)	1.1599E-05 (261, 2)	1.1732E-05 (261, 2)	9.8400E-06 (261, 2)	6.4151E-06 (359, 2)
31	1.1572E-05 (150, 1)	1.3714E-05 (150, 1)	1.4135E-05 (150, 1)	1.2262E-05 (150, 1)	8.3450E-06 (120, 2)
32	1.0226E-05 (33, 1)	1.1656E-05 (33, 1)	1.1634E-05 (33, 1)	9.7372E-06 (33, 1)	6.2927E-06 (33, 1)
33	8.4697E-06 (165, 1)	1.0307E-05 (165, 1)	1.0821E-05 (165, 1)	9.5271E-06 (165, 1)	6.4699E-06 (165, 1)
34	1.9691E-05 (46, 1)	2.3964E-05 (46, 1)	2.5182E-05 (46, 1)	2.2220E-05 (46, 1)	1.5532E-05 (46, 1)
35	1.2827E-05 (173, 1)	1.5629E-05 (173, 1)	1.6431E-05 (173, 1)	1.4503E-05 (173, 1)	9.8965E-06 (173, 1)
36	8.0073E-06 (130, 2)	9.4229E-06 (130, 2)	9.6530E-06 (130, 2)	8.3202E-06 (130, 2)	6.3862E-06 (27, 3)

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

YEARLY SECOND MAXIMUM   3-HOUR CONC= 1.6404E-05   DIRECTION= 1   DISTANCE= 1.6 KM   DAY= 44   TIME PERIOD= 1

SECOND HIGHEST 3-HOUR CONCENTRATION AT EACH RECEPTOR

DIR \ RANGE	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	1.1186E-05 (44, 1)	1.4662E-05 (44, 1)	1.6404E-05 (44, 1)	1.5401E-05 (44, 1)	1.1176E-05 (44, 1)
2	7.4701E-06 (46, 6)	6.1646E-06 (44, 1)	5.3992E-06 (43, 8)	4.1444E-06 (43, 8)	2.3895E-06 (359, 7)
3	5.8232E-06 (29, 7)	5.5297E-06 (203, 8)	5.2900E-06 (49, 7)	4.3180E-06 (49, 7)	2.8224E-06 (49, 7)
4	7.6855E-06 (155, 1)	8.8655E-06 (155, 1)	8.9892E-06 (155, 1)	7.7352E-06 (155, 1)	5.1868E-06 (12, 1)
5	6.7916E-06 (272, 1)	6.8884E-06 (30, 8)	6.6264E-06 (272, 1)	5.1423E-06 (272, 1)	3.1343E-06 (19, 6)
6	9.0815E-06 (309, 7)	1.0323E-05 (309, 7)	1.0218E-05 (309, 7)	8.3741E-06 (309, 7)	5.1636E-06 (309, 7)
7	7.4631E-06 (268, 5)	8.4904E-06 (210, 8)	8.6865E-06 (210, 8)	7.5244E-06 (84, 7)	5.1022E-06 (84, 7)
8	1.1028E-05 (168, 2)	1.3138E-05 (168, 1)	1.3475E-05 (168, 1)	1.1582E-05 (168, 1)	7.6657E-06 (168, 1)
9	1.1530E-05 (272, 2)	1.3593E-05 (272, 2)	1.3996E-05 (272, 2)	1.2187E-05 (272, 2)	8.3219E-06 (272, 2)
10	9.2638E-06 (14, 7)	1.1129E-05 (14, 7)	1.1495E-05 (14, 7)	9.8228E-06 (14, 7)	6.2872E-06 (14, 7)
11	8.6044E-06 (236, 8)	1.0479E-05 (236, 8)	1.1012E-05 (236, 8)	9.7167E-06 (236, 8)	6.6258E-06 (236, 8)
12	1.0003E-05 (325, 7)	1.1654E-05 (325, 7)	1.1796E-05 (325, 7)	9.9246E-06 (325, 7)	6.2974E-06 (325, 7)
13	1.1147E-05 (315, 7)	1.2737E-05 (315, 7)	1.2780E-05 (315, 7)	1.0830E-05 (315, 7)	7.1964E-06 (315, 7)
14	8.8403E-06 (123, 1)	1.0820E-05 (123, 1)	1.1433E-05 (123, 1)	1.0180E-05 (123, 1)	7.0624E-06 (123, 1)
15	1.1691E-05 (105, 8)	1.4430E-05 (105, 8)	1.5077E-05 (105, 8)	1.3140E-05 (105, 8)	8.7258E-06 (105, 8)
16	1.2307E-05 (167, 8)	1.4545E-05 (167, 8)	1.4984E-05 (167, 8)	1.3037E-05 (167, 8)	8.8818E-06 (167, 8)
17	8.2603E-06 (77, 1)	9.4276E-06 (323, 2)	9.6214E-06 (323, 2)	8.4767E-06 (77, 2)	6.5701E-06 (77, 2)
18	8.5672E-06 (355, 6)	9.8980E-06 (42, 8)	1.0215E-05 (42, 8)	8.9156E-06 (42, 8)	6.1199E-06 (42, 8)
19	6.5950E-06 (365, 8)	7.3367E-06 (366, 8)	7.0097E-06 (366, 8)	5.3523E-06 (366, 8)	3.1370E-06 (364, 8)
20	7.6762E-06 (204, 1)	8.0574E-06 (18, 8)	7.9457E-06 (18, 8)	6.7105E-06 (18, 8)	4.4961E-06 (306, 2)
21	1.0946E-05 (60, 1)	1.3432E-05 (60, 1)	1.4254E-05 (60, 1)	1.2837E-05 (124, 2)	9.5004E-06 (124, 2)
22	8.8319E-06 (237, 8)	1.0779E-05 (237, 8)	1.1360E-05 (237, 8)	9.7400E-06 (60, 2)	6.9556E-06 (237, 8)
23	9.9784E-06 (342, 8)	1.2447E-05 (342, 8)	1.3302E-05 (342, 8)	1.2479E-05 (77, 2)	9.2817E-06 (77, 2)
24	9.8472E-06 (308, 1)	1.1494E-05 (308, 1)	1.2084E-05 (308, 1)	1.0950E-05 (124, 8)	7.8589E-06 (292, 3)
25	1.1241E-05 (43, 1)	1.3476E-05 (43, 1)	1.4045E-05 (43, 1)	1.2369E-05 (43, 1)	8.7552E-06 (43, 1)
26	9.0215E-06 (268, 2)	9.6365E-06 (86, 8)	1.0171E-05 (365, 2)	8.7688E-06 (86, 8)	6.2076E-06 (180, 1)
27	1.1742E-05 (355, 8)	1.4282E-05 (355, 8)	1.4956E-05 (355, 8)	1.3737E-05 (122, 1)	9.5452E-06 (198, 2)
28	8.7179E-06 (86, 2)	1.0085E-05 (200, 1)	1.0384E-05 (200, 1)	9.0493E-06 (200, 1)	6.2562E-06 (118, 2)
29	1.1377E-05 (197, 2)	1.3956E-05 (200, 8)	1.4682E-05 (200, 8)	1.4125E-05 (120, 1)	1.0188E-05 (197, 2)
30	8.2940E-06 (232, 2)	9.5843E-06 (232, 2)	9.7070E-06 (232, 2)	8.5495E-06 (359, 2)	6.2111E-06 (261, 2)
31	8.1935E-06 (6, 3)	9.7997E-06 (120, 2)	1.0607E-05 (120, 2)	1.0319E-05 (120, 2)	8.2685E-06 (150, 1)
32	9.5909E-06 (123, 2)	1.1168E-05 (123, 2)	1.1288E-05 (123, 2)	9.4687E-06 (123, 2)	5.9839E-06 (123, 2)
33	8.2390E-06 (189, 2)	9.1421E-06 (189, 2)	9.2740E-06 (164, 8)	7.9413E-06 (164, 8)	5.2485E-06 (164, 8)
34	9.8358E-06 (14, 8)	1.1713E-05 (14, 8)	1.2145E-05 (14, 8)	1.0596E-05 (14, 8)	7.5183E-06 (15, 1)
35	1.1320E-05 (157, 1)	1.3676E-05 (157, 1)	1.4203E-05 (157, 1)	1.2232E-05 (157, 1)	7.9352E-06 (157, 1)
36	7.8289E-06 (12, 3)	8.0205E-06 (27, 3)	8.6874E-06 (27, 3)	8.2749E-06 (27, 3)	5.5748E-06 (130, 2)

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

YEARLY MAXIMUM 1-HOUR CONC= 3.2149E-05 DIRECTION= 34 DISTANCE= 1.6 KM DAY= 46 HOUR= 1

HIGHEST 1-HOUR CONCENTRATION AT EACH RECEPTOR

RANGE / DIR	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	1.8987E-05 (44, 2)	2.5089E-05 (44, 2)	2.8387E-05 (44, 2)	2.7244E-05 (44, 2)	2.0678E-05 (44, 2)
2	1.7199E-05 (174,24)	1.4188E-05 (174,24)	1.3782E-05 (44, 1)	1.1692E-05 (44, 1)	6.8132E-06 (44, 1)
3	1.4560E-05 (174,24)	1.1869E-05 (174,24)	1.0886E-05 (11,21)	9.2257E-06 (31, 1)	6.4039E-06 (31, 1)
4	1.3545E-05 (155, 2)	1.6578E-05 (155, 2)	1.7531E-05 (155, 2)	1.5647E-05 (155, 2)	1.0922E-05 (155, 2)
5	1.1498E-05 (142,19)	1.1310E-05 (11,23)	1.0883E-05 (11,23)	9.9262E-06 (19,18)	7.0459E-06 (19,18)
6	1.3752E-05 (309,24)	1.6864E-05 (309,24)	1.7873E-05 (309,24)	1.6015E-05 (309,24)	1.1268E-05 (309,24)
7	1.3840E-05 (210,24)	1.6943E-05 (210,24)	1.7934E-05 (210,24)	1.6051E-05 (210,24)	1.1282E-05 (210,24)
8	1.3794E-05 (168, 6)	1.6902E-05 (168, 6)	1.7903E-05 (168, 6)	1.6050E-05 (168, 7)	1.2693E-05 (168, 7)
9	1.3617E-05 (272, 5)	1.6643E-05 (272, 5)	1.7580E-05 (272, 5)	1.5675E-05 (272, 5)	1.0932E-05 (272, 5)
10	1.3957E-05 (366,15)	1.7114E-05 (180, 1)	1.8648E-05 (180, 1)	1.8166E-05 (180, 1)	1.5019E-05 (180, 1)
11	1.2907E-05 (236,22)	1.5718E-05 (236,22)	1.6518E-05 (236,22)	1.4575E-05 (236,22)	9.9386E-06 (236,22)
12	1.3512E-05 (112,22)	1.6548E-05 (112,22)	1.7508E-05 (112,22)	1.5634E-05 (112,22)	1.0917E-05 (112,22)
13	1.7701E-05 (90, 4)	2.2634E-05 (364, 6)	2.5678E-05 (364, 6)	2.4648E-05 (364, 6)	1.8442E-05 (364, 6)
14	1.3859E-05 (190,23)	1.6960E-05 (190,23)	1.8201E-05 (108, 1)	1.7703E-05 (108, 1)	1.4544E-05 (108, 1)
15	1.3812E-05 (194, 4)	1.6918E-05 (194, 4)	1.7915E-05 (194, 4)	1.6040E-05 (194, 4)	1.2758E-05 (69, 2)
16	1.8528E-05 (124, 4)	2.4533E-05 (124, 4)	2.7858E-05 (124, 4)	2.6873E-05 (124, 4)	2.0480E-05 (124, 4)
17	1.7623E-05 (300, 3)	2.2425E-05 (77, 4)	2.5830E-05 (77, 4)	2.5430E-05 (77, 4)	1.9710E-05 (77, 4)
18	1.3958E-05 (365,24)	1.7430E-05 (338, 2)	1.9760E-05 (338, 2)	1.9976E-05 (338, 2)	1.6418E-05 (338, 2)
19	1.5967E-05 (355,15)	1.5732E-05 (365,24)	1.5327E-05 (365,24)	1.2180E-05 (365,24)	8.0830E-06 (338, 5)
20	1.4210E-05 (365, 1)	1.6602E-05 (204, 3)	1.7549E-05 (204, 3)	1.5657E-05 (204, 3)	1.0925E-05 (204, 3)
21	2.2656E-05 (60, 1)	2.9123E-05 (60, 1)	3.2082E-05 (60, 1)	2.9935E-05 (60, 1)	2.2412E-05 (60, 1)
22	2.2253E-05 (60, 4)	2.8574E-05 (60, 4)	3.1424E-05 (60, 4)	2.9220E-05 (60, 4)	2.1713E-05 (60, 4)
23	1.5918E-05 (77, 6)	2.1190E-05 (77, 6)	2.4279E-05 (77, 6)	2.3652E-05 (77, 6)	1.7921E-05 (77, 6)
24	1.7627E-05 (129, 5)	1.9596E-05 (129, 5)	2.1081E-05 (60, 7)	1.9415E-05 (60, 7)	1.4485E-05 (60, 7)
25	1.8046E-05 (43, 3)	2.1737E-05 (43, 3)	2.2802E-05 (43, 3)	2.0842E-05 (61, 4)	1.7006E-05 (61, 4)
26	1.5937E-05 (118, 6)	1.9547E-05 (118, 6)	2.0934E-05 (118, 6)	1.9138E-05 (118, 6)	1.5567E-05 (62, 7)
27	1.7863E-05 (118, 4)	2.1528E-05 (60, 6)	2.3057E-05 (60, 6)	2.0335E-05 (60, 6)	1.6422E-05 (122, 2)
28	2.0566E-05 (118, 5)	2.4095E-05 (118, 5)	2.6680E-05 (44, 4)	2.5338E-05 (44, 4)	1.8801E-05 (44, 4)
29	1.8975E-05 (121, 2)	2.2730E-05 (121, 2)	2.3741E-05 (121, 2)	2.1122E-05 (121, 2)	1.5422E-05 (121, 2)
30	1.3607E-05 (232, 6)	1.6634E-05 (232, 6)	1.7575E-05 (359, 6)	1.6443E-05 (2,18)	1.3103E-05 (2,18)
31	1.3997E-05 (120, 5)	1.7848E-05 (120, 5)	2.0229E-05 (120, 5)	2.0487E-05 (120, 5)	1.6950E-05 (120, 5)
32	1.4319E-05 (129, 1)	1.6935E-05 (169,24)	1.7927E-05 (169,24)	1.6047E-05 (169,24)	1.1280E-05 (169,24)
33	1.3626E-05 (249,21)	1.6651E-05 (249,21)	1.7587E-05 (249,21)	1.6050E-05 (191, 7)	1.3801E-05 (42, 5)
34	2.4525E-05 (46, 1)	3.0270E-05 (46, 1)	3.2149E-05 (46, 1)	2.8745E-05 (46, 1)	2.0544E-05 (46, 1)
35	1.3821E-05 (173, 1)	1.6926E-05 (173, 1)	1.7921E-05 (173, 1)	1.6043E-05 (173, 1)	1.1279E-05 (173, 1)
36	1.2816E-05 (130, 5)	1.5637E-05 (130, 5)	1.6457E-05 (130, 5)	1.5980E-05 (27, 8)	1.2735E-05 (27, 8)

[illegible] EMISSION UNITS: GM/SEC AIR QUALITY UNITS: GM/M**3

YEARLY SECOND MAXIMJM 1-HOUR CONC= 2.8995E-05 DIRECTION= 34 DISTANCE= 1.6 KM DAY= 46 HOUR= 2

SECOND HIGHEST 1-HOUR CONCENTRATION AT EACH RECEPTOR

DIR \ RANGE	1.0 KM	1.3 KM	1.6 KM	2.3 KM	3.8 KM
1	1.6490E-05 (43,24)	2.1572E-05 (43,24)	2.4066E-05 (43,24)	2.2455E-05 (43,24)	1.6044E-05 (43,24)
2	1.1498E-05 (215,19)	1.2954E-05 (44, 1)	1.1441E-05 (174,24)	8.8918E-06 (271, 5)	5.7859E-06 (271, 5)
3	1.1332E-05 (209,14)	1.1314E-05 (11,21)	1.0488E-05 (125, 5)	8.8808E-06 (11,21)	5.8190E-06 (20,22)
4	1.3504E-05 (12, 2)	1.6541E-05 (12, 2)	1.7502E-05 (12, 2)	1.5631E-05 (12, 2)	1.0915E-05 (12, 2)
5	1.1410E-05 (242,18)	1.0731E-05 (270,20)	1.0883E-05 (19,18)	9.9150E-06 (354,21)	7.0415E-06 (354,21)
6	1.3520E-05 (309,23)	1.6556E-05 (309,23)	1.7514E-05 (309,23)	1.5637E-05 (309,23)	1.0918E-05 (309,23)
7	1.3580E-05 (84,21)	1.6610E-05 (84,21)	1.7555E-05 (84,21)	1.5660E-05 (84,21)	1.0927E-05 (84,21)
8	1.3571E-05 (168, 3)	1.6602E-05 (168, 3)	1.7549E-05 (168, 3)	1.6033E-05 (168, 6)	1.1275E-05 (168, 6)
9	1.3607E-05 (272, 6)	1.6634E-05 (272, 6)	1.7574E-05 (272, 6)	1.5671E-05 (272, 6)	1.0931E-05 (272, 6)
10	1.3837E-05 (180, 1)	1.6918E-05 (179,23)	1.8272E-05 (179,24)	1.7735E-05 (179,24)	1.4551E-05 (179,24)
11	1.2907E-05 (236,23)	1.5718E-05 (236,23)	1.6518E-05 (236,23)	1.4575E-05 (236,23)	9.9386E-06 (236,23)
12	1.1847E-05 (148, 2)	1.4235E-05 (112,24)	1.4847E-05 (112,24)	1.2888E-05 (112,24)	8.4708E-06 (112,24)
13	1.7097E-05 (364, 6)	2.0590E-05 (364, 7)	2.3157E-05 (364, 7)	2.1842E-05 (364, 7)	1.5738E-05 (364, 7)
14	1.3754E-05 (335,18)	1.6842E-05 (123, 2)	1.7947E-05 (190,23)	1.6058E-05 (190,23)	1.1285E-05 (190,23)
15	1.3607E-05 (162,22)	1.6634E-05 (162,22)	1.7574E-05 (162,22)	1.6006E-05 (69, 2)	1.1751E-05 (354, 3)
16	1.5786E-05 (124, 2)	2.0600E-05 (124, 2)	2.3004E-05 (124, 2)	2.1540E-05 (124, 2)	1.5445E-05 (124, 2)
17	1.6782E-05 (77, 4)	1.9594E-05 (300, 3)	1.9212E-05 (300, 3)	1.7708E-05 (291, 7)	1.3516E-05 (291, 7)
18	1.3958E-05 (366,24)	1.6548E-05 (23,22)	1.7508E-05 (23,22)	1.6467E-05 (338, 1)	1.2739E-05 (338, 1)
19	1.3958E-05 (365,24)	1.5732E-05 (366,24)	1.5327E-05 (365,24)	1.2180E-05 (366,24)	8.0708E-06 (325, 7)
20	1.3571E-05 (204, 3)	1.6140E-05 (365, 1)	1.6068E-05 (365, 1)	1.3461E-05 (365, 1)	9.3226E-06 (344, 7)
21	1.8970E-05 (121, 5)	2.2727E-05 (121, 5)	2.3739E-05 (121, 5)	2.1538E-05 (124, 5)	1.5444E-05 (124, 5)
22	1.3598E-05 (237,23)	1.6626E-05 (237,23)	1.7567E-05 (237,23)	1.5667E-05 (237,23)	1.0929E-05 (237,23)
23	1.5358E-05 (352,24)	1.8924E-05 (352,24)	2.0385E-05 (352,24)	1.8774E-05 (352,24)	1.3936E-05 (352,24)
24	1.5910E-05 (60, 7)	1.9589E-05 (60, 7)	1.9213E-05 (129, 5)	1.8115E-05 (292, 7)	1.3755E-05 (292, 7)
25	1.6134E-05 (78, 2)	1.8691E-05 (43, 2)	2.0552E-05 (61, 4)	2.0842E-05 (61, 6)	1.7006E-05 (61, 6)
26	1.5883E-05 (118, 3)	1.8326E-05 (118, 3)	1.8602E-05 (118, 3)	1.8869E-05 (62, 7)	1.4134E-05 (118, 6)
27	1.7087E-05 (60, 6)	2.0718E-05 (118, 4)	2.1030E-05 (46, 6)	2.0005E-05 (122, 2)	1.3492E-05 (60, 6)
28	1.8003E-05 (44, 4)	2.3703E-05 (44, 4)	2.4660E-05 (118, 5)	2.1464E-05 (118, 5)	1.5407E-05 (118, 5)
29	1.5081E-05 (78, 3)	1.8281E-05 (197, 5)	2.0831E-05 (197, 5)	2.0144E-05 (197, 5)	1.4931E-05 (120, 3)
30	1.3536E-05 (105, 1)	1.6570E-05 (105, 1)	1.7574E-05 (232, 6)	1.6187E-05 (359, 6)	1.2674E-05 (359, 6)
31	1.3821E-05 (150, 2)	1.6926E-05 (150, 2)	1.7921E-05 (150, 2)	1.6043E-05 (150, 2)	1.1279E-05 (150, 2)
32	1.3830E-05 (169,24)	1.5789E-05 (129, 1)	1.6512E-05 (243, 4)	1.4572E-05 (243, 4)	9.9374E-06 (243, 4)
33	1.3607E-05 (165, 1)	1.6634E-05 (165, 1)	1.7574E-05 (165, 1)	1.6020E-05 (42, 5)	1.2693E-05 (191, 7)
34	2.2456E-05 (46, 2)	2.7543E-05 (46, 2)	2.8996E-05 (46, 2)	2.5473E-05 (46, 2)	1.7531E-05 (46, 2)
35	1.3562E-05 (157, 4)	1.6594E-05 (157, 4)	1.7543E-05 (157, 4)	1.5654E-05 (157, 4)	1.0955E-05 (157, 4)
36	1.2432E-05 (175, 1)	1.3351E-05 (7, 5)	1.5198E-05 (27, 8)	1.4540E-05 (130, 5)	9.9256E-06 (130, 5)

74 10

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

MAXIMUM DAILY CONCENTRATIONS

DAY	24-HOUR CONCENTRATION	DIRECTION	DISTANCE
168	5.2083E-06	8	1.25
198	4.5024E-06	27	1.60
230	4.1727E-06	10	1.00
312	4.0458E-06	22	1.00
8	3.9809E-06	25	1.00
340	3.9103E-06	25	1.25
140	3.8723E-06	28	1.00
348	3.8681E-06	24	1.00
313	3.8410E-06	22	1.00
274	3.7886E-06	22	1.00
192	3.7763E-06	9	1.00
118	3.7743E-06	28	1.00
2	3.7592E-06	28	1.00
309	3.7539E-06	6	1.25
61	3.6704E-06	25	1.60
285	3.6702E-06	25	1.00
272	3.6319E-06	9	1.00
266	3.6145E-06	22	1.00
175	3.6108E-06	36	1.00
46	3.5725E-06	34	1.60
338	3.4956E-06	18	1.25
355	3.4437E-06	27	1.25
350	3.3842E-06	17	1.00
280	3.3324E-06	18	1.00
40	3.3235E-06	15	1.00
295	3.2986E-06	22	1.00
286	3.2286E-06	24	1.00
356	3.2242E-06	27	1.00
66	3.2154E-06	27	1.25
121	3.2016E-06	21	1.60
213	3.1451E-06	34	1.00
107	3.1368E-06	14	1.25
73	3.1239E-06	25	1.00
77	3.1055E-06	17	1.60
79	3.0834E-06	1	1.00
124	3.0744E-06	16	1.60
337	3.0723E-06	9	1.60
205	3.0567E-06	28	1.00
267	3.0486E-06	23	1.00
364	3.0289E-06	13	1.60
303	3.0093E-06	25	1.00
59	3.0040E-06	22	1.00
275	2.9832E-06	22	1.00
264	2.9650E-06	24	1.00
197	2.9611E-06	29	1.60
88	2.9593E-06	6	1.00
83	2.9519E-06	2	1.00
157	2.9514E-06	35	1.60
36	2.9454E-06	28	1.00
71	2.9403E-06	9	1.00

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

MAXIMUM 3-HOURLY CONCENTRATIONS

DAY	3-HOUR CONCENTRATION	DIRECTION	DISTANCE	TIME PERIOD
46	2.5182E-05	34	1.60	1
46	2.3964E-05	34	1.25	1
46	2.2220E-05	34	2.30	1
46	1.9691E-05	34	1.00	1
43	1.8946E-05	1	1.60	8
43	1.7553E-05	1	1.25	8
343	1.7198E-05	23	1.60	1
43	1.7152E-05	1	2.30	8
59	1.6880E-05	21	1.60	8
162	1.6864E-05	15	1.60	8
309	1.6746E-05	6	1.60	8
61	1.6594E-05	25	1.60	2
173	1.6431E-05	35	1.60	1
44	1.6404E-05	1	1.60	1
61	1.6400E-05	25	2.30	2
343	1.6243E-05	23	1.25	1
59	1.6028E-05	21	1.25	8
162	1.6016E-05	15	1.25	8
198	1.5982E-05	27	1.60	2
362	1.5925E-05	16	1.60	2
364	1.5895E-05	13	1.60	2
309	1.5887E-05	6	1.25	8
173	1.5629E-05	35	1.25	1
46	1.5532E-05	34	3.80	1
44	1.5401E-05	1	2.30	1
197	1.5400E-05	29	1.60	2
343	1.5351E-05	23	2.30	1
179	1.5319E-05	10	1.60	8
198	1.5225E-05	27	1.25	2
362	1.5149E-05	16	1.25	2
105	1.5077E-05	15	1.60	8
112	1.5067E-05	12	1.60	8
167	1.4984E-05	16	1.60	8
355	1.4956E-05	27	1.60	8
364	1.4938E-05	13	2.30	2
162	1.4937E-05	15	2.30	8
61	1.4901E-05	25	1.25	2
107	1.4872E-05	14	1.60	8
337	1.4870E-05	9	1.60	7
309	1.4848E-05	6	2.30	8
200	1.4682E-05	29	1.60	8
59	1.4681E-05	21	2.30	8
44	1.4662E-05	1	1.25	1
120	1.4652E-05	29	1.60	1
179	1.4601E-05	10	1.25	8
167	1.4545E-05	16	1.25	8
173	1.4503E-05	35	2.30	1
66	1.4431E-05	27	1.60	1
105	1.4430E-05	15	1.25	8
112	1.4416E-05	12	1.25	8

PLANT NAME: HILLSBOROUGH 1000 TPD   POLLUTANT: 1G/S   EMISSION UNITS: GM/SEC   AIR QUALITY UNITS: GM/M**3

MAXIMUM HOURLY CONCENTRATIONS

DAY	1-HOUR CONCENTRATION	DIRECTION	DISTANCE	HOUR
46	3.2149E-05	34	1.60	1
60	3.2082E-05	21	1.60	1
60	3.1424E-05	22	1.60	4
46	3.0270E-05	34	1.25	1
60	2.9935E-05	21	2.30	1
60	2.9220E-05	22	2.30	4
60	2.9123E-05	21	1.25	1
46	2.8996E-05	34	1.60	2
46	2.8745E-05	34	2.30	1
60	2.8574E-05	22	1.25	4
44	2.8387E-05	1	1.60	2
124	2.7858E-05	16	1.60	4
46	2.7543E-05	34	1.25	2
44	2.7244E-05	1	2.30	2
124	2.6873E-05	16	2.30	4
44	2.6680E-05	28	1.60	4
77	2.5830E-05	17	1.60	4
364	2.5678E-05	13	1.60	6
46	2.5473E-05	34	2.30	2
77	2.5430E-05	17	2.30	4
44	2.5338E-05	28	2.30	4
44	2.5089E-05	1	1.25	2
118	2.4660E-05	28	1.60	5
364	2.4648E-05	13	2.30	6
124	2.4533E-05	16	1.25	4
46	2.4525E-05	34	1.00	1
77	2.4279E-05	23	1.60	6
118	2.4095E-05	28	1.25	5
43	2.4066E-05	1	1.60	24
121	2.3741E-05	29	1.60	2
121	2.3739E-05	21	1.60	5
44	2.3703E-05	28	1.25	4
77	2.3652E-05	23	2.30	6
364	2.3157E-05	13	1.60	7
59	2.3058E-05	21	1.60	24
60	2.3057E-05	27	1.60	6
124	2.3004E-05	16	1.60	2
124	2.2998E-05	21	1.60	5
43	2.2802E-05	25	1.60	3
121	2.2730E-05	29	1.25	2
121	2.2727E-05	21	1.25	5
60	2.2656E-05	21	1.00	1
364	2.2634E-05	13	1.25	6
46	2.2456E-05	34	1.00	2
43	2.2455E-05	1	2.30	24
77	2.2425E-05	17	1.25	4
60	2.2412E-05	21	3.80	1
60	2.2253E-05	22	1.00	4
364	2.1842E-05	13	2.30	7
43	2.1737E-05	25	1.25	3

TAMPA INCINERATOR
5/15/81

participants	Organization	phone #
C Bock	DER	488-1344
Easel Roberts	HDR	402-399-1374
GENE HANSON	HDR.	(402) 399-1355
Douglas Gardner	Hillsborough County	272-6677
DICK COX	"	(813) 272-6676
JOE MURDOCH	Hills County	
Bill Thomas	DER-BAQM	(904) 488-1344
Larry George	DER-BAQM	"
CLAIR FANCY	" "	" " "
Ray Morean	DER/Res. Recovery	488-0300
JOHN Svec	DER/BAQM	488-1344

TAMPA
INCINERATOR

(1)

our letter we said they couldn't offset old to build new as shutdown for ozone was already in plan

Hillsboro plan for potential was also in the plan.

Murdock (   ) said county would be willing to re-write plan

Old one was in operation up thru baseline period. As it is shutdown, there is no operating.

Question: Can they use old plant as offsets.
Rule says: If major is shut down & they don't bank it, goes into State Bank for anyone's use

New Source Allowance is in our bank
offset is something they must do.

Must show that

Table II Incinerator limits

Meeting federal secondary standard

5200 ton/wk incinerator

state & federal stds. Have not addressed federal std
Already taken credit for incinerator shutdown, figs 31-33 no good.

To get the permit, they must show incinerator is equipped with [illegible].
City must stipulate they are in compliance with air rules.

Does 833[#] represent RACT. RACT would be allowable under 17.2

Show attainment at all sites - probably with a new plan.
API

Argonne Nat Lab
9700 S. Cass Ave
Argonne, Ill. 60439

Proceedings of the International conference on european waste-to-energy technology
ANL/CNSV TM 14 Oct 29-31, 1980
Reston, Va
prep for US Dept Energy

gen of sofotic organics

Dispos PCB in Calif
9/19/80 Calif Air Res. Board
Report LE-80-007
S A Proposed Air Resources Board Policy Regarding Incineration as an Acceptable Technology for PCB Disposal
Mar 25, 1981

municipal incinerator emission standards
Or Co Res Rec Prog
to O & F
Mar 81
AD Little
Cambridge Mass

Tampa Incinerator

existing facility:

STACKS - 3, 90' x 7', 170° exit temp.

Av. 38,000 - conservative

Cell #	gr/cfm	corrected to 50% xair+moisture	lb/hr
1	.18	.267	86.96
2	.17	.237	77.19
3	.15	.235	76.50
		Actual Total	240.65 lb/hr

STACK flow
1. 73,900 ACfm
   42,038 scfm
2. 67,900 ACfm
   38,338 scfm
3. 66,165 ACfm
   38,205 scfm

The following summarizes the effects [illegible] emission reductions. *From HEPC SIP Proposal.*

Control Strategies for Station 1

			With Inc. Rehab
1.	Percent reduction from fugitive dust controls	5.77	5.77
2.	Percent reduction from the closing of the incinerator	12.66	11.14
3.	Percent reduction from DCO for Fla. Steel Corporation	0.09	0.09
4.	Percent reduction from transportation improvements	0.08	0.08
	Total Expected % Reduction	18.60%	17.08 %
	Needed % Emission Reduction	13.7 %	13.7%
	Cushion	4.90%	3.38%

Control Strategies for Station 63

1.	Percent reduction from fugitive dust controls	15.93	15.93
2.	Percent reduction from closing incinerator	5.93	5.49
3.	Percent reduction from DCO for Fla. Steel Corporation	0.0	0.0
4.	Percent reduction from transportation improvements	0.08	0.08
	Total Expected % Reduction	21.94%	21.50%
	Needed % Emission Reduction	4.7 %	4.7
	Cushion	17.24%	16.8 %

Control Strategies for Station 92

1.	Percent reduction from fugitive dust controls	5.79	5.79
2.	Percent reduction from closing incinerator	7.49	6.70
3.	Percent reduction from Fla. Steel Corporation DCO	0.29	0.29
4.	Percent reduction from transportation improvements	.06	0.06
	Total Expected % Reduction	13.63%	12.58%
	Needed % Emission Reduction	17.3 %	17.3
	Cushion	- 3.67%	-4.72%

This station is at the center of NAA. A control strategy for selected nearby paved roads will provide the necessary additional reductions.

Control Strategies for Station 103

			With INC Rehab
1.	Percent reduction from fugitive dust controls	6.13	6.13
2.	Percent reduction from incinerator closure	14.02	12.48
3.	Percent reduction from Fla. Steel Corporation DCO	0.09	0.09
4.	Percent reduction from transportation improvements	0.07	0.07
	Total Expected % Reduction	20.31%	18.77%
	Needed % Emission Reduction	16.0 %	16.0%
	Cushion	4.31%	2.77%

MAINTENANCE OF THE NAAQS

Air quality modeling, as a technique to determine the expected TSP concentration from proposed constructions and modifications, will be useful in maintenance of the standard. We are now developing in-house expertise in this area. Applying selective modeling techniques will assist in evaluating additional control strategies, analyzing air quality violations, and locating monitors.

We are awaiting an EPA approved policy from FDER concerning application of Bubble Policy, Emissions Banking and Offsets. Use of these techniques will allow for growth of both new and existing industrial point sources while improving the ambient TSP concentration. Air Quality Modeling will be used to evaluate requests to apply these control strategies. Having this expertise in-house will also permit measurement of combined small sources. As our proficiency increases we intend to expand this modeling to include complex, area, and non-traditional sources in greater detail.

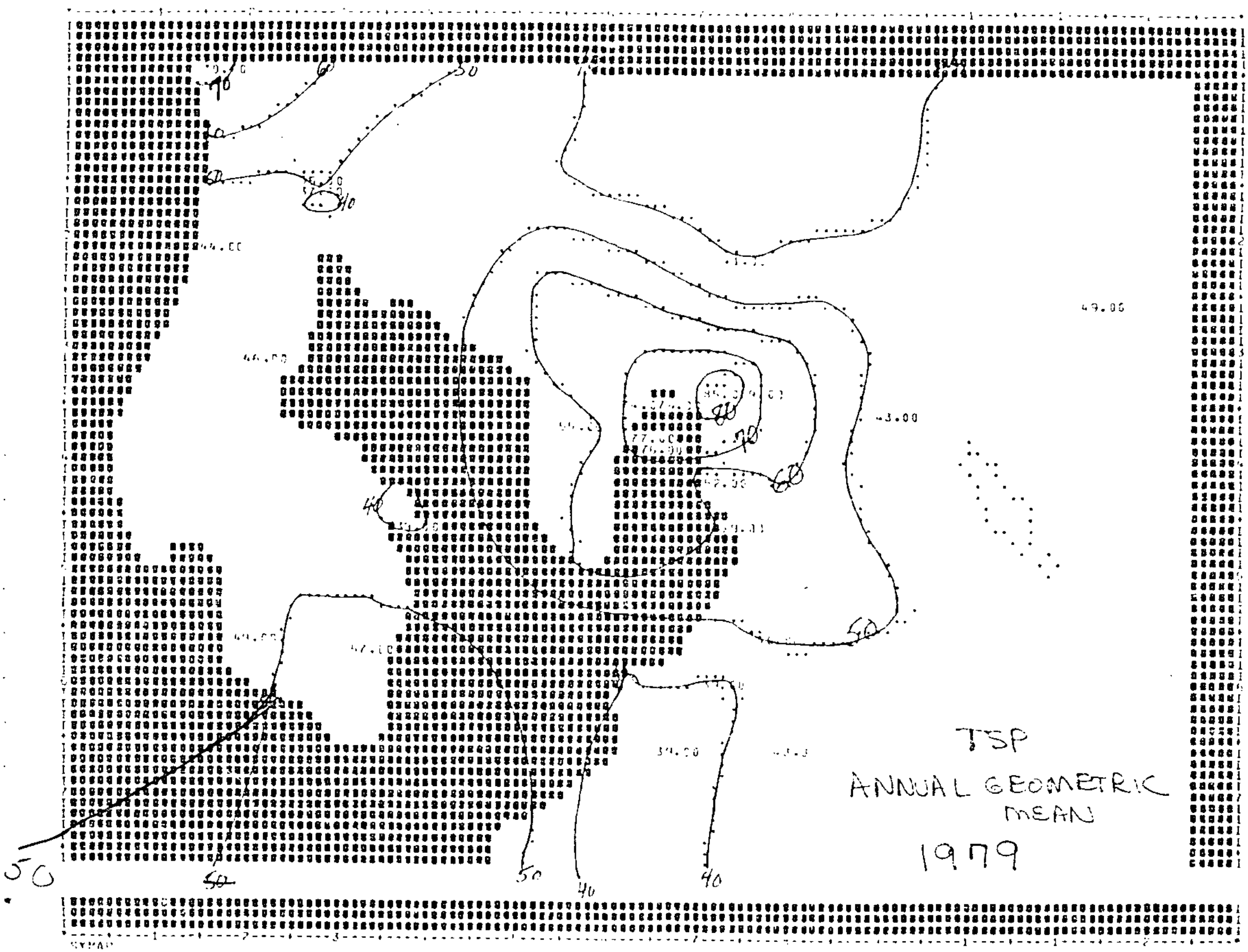
IMPACT OF REHABILITATED TAMPA INCINERATOR

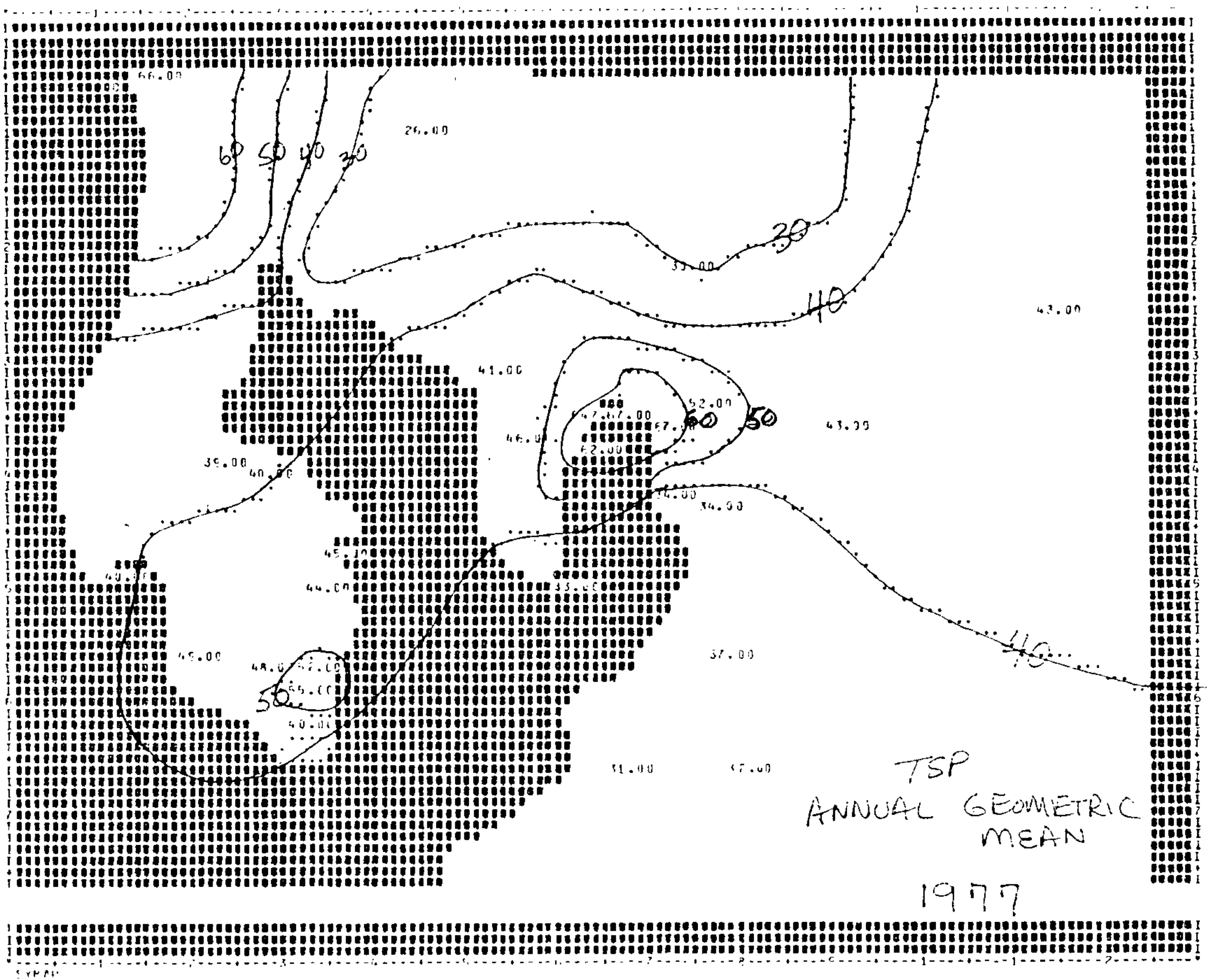
1974 CRSTER Run

Input Data

Unit	Emission Rate Basis	Stk Ht	Diameter	Exit Vel.	Exit Temp	Vol Flow Rate	Part. Emission Rate
1	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
2	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
3	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
4	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
		(150 ft)	(4.43 ft)	(70.ft/s)	(440 °F)	(65 K ACFM)	

	Stn 1	Stn 63	Stn 92	Stn 103	Worst
Annual Impact on Non-Compliance Monitors	.61 $\mu g/m^3$	.16 $\mu g/m^3$	.29/$\mu g/m^3$	.64 $\mu g/m^3$	.78 $\mu g/m^3$
Highest	5.2	2.0	4.1	3.2	6.0 mg/m^3
Second 24 hr	3.9	1.8	2.3	3.2	4.4 mg/m^3


TSP
ANNUAL GEOMETRIC MEAN
1979
49.00
43.00
39.00
SYMAP



12.756 SECONDS FOR MAP

DATE.. 81/01/12.., CLOCK.. 09.58.25.., CP.. 15.232, PP.. 15.357, IO.. 15.223

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

- -

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

- -

War Memorial
Syracuse, New York

May 6, 1981
10:00 a.m.

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
By: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Region Attorney
Region 7

I N D E X

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

War Memorial
Syracuse, New York

April 16, 1981
10:00 a.m.

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
BY: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Region Attorney
Region 7

I N D E X

I N D E X (Continued)

E X H I B I T S

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

War Memorial
Syracuse, New York

April 15, 1981
10:00 a.m.

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
By: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Region Attorney
Region 7

I N D E X

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

- -

PUBLIC HEARING TO CONSIDER THE PENDING
APPLICATIONS OF THE COUNTY OF ONONDAGA,
AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY
RESOURCE RECOVERY PROJECT (OCRP)

- -

War Memorial
Syracuse, New York

April 14, 1981

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
By: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Region Attorney
Region 7

I N D E X

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

- -

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

- -

War Memorial
Syracuse, New York

April 2, 1981
10:00 a.m.

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
By: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Regional Attorney
Region 7

I N D E X

* * *

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

War Memorial
Syracuse, New York

April 1, 1981
10:00 a.m.

B e f o r e : Francis W. Serbent, P.E.
Administrative Law Judge

APPEARANCES:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
Attorneys at Law
809 MONY Plaza
Syracuse, New York 13202
By: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Regional Attorney
Region 7

I N D E X

NEW YORK STATE - DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PUBLIC HEARING TO CONSIDER THE PENDING APPLICATIONS OF THE COUNTY OF ONONDAGA, AS PROJECT SPONSOR, FOR THE ONONDAGA COUNTY RESOURCE RECOVERY PROJECT (OCRP)

War 'emorial
Syracuse, New York

March 26, 1981
10:00 a.m.

Before: Francis W. Serbent, P.E.
Administrative Law Judge

Appearances:

For the County of Onondaga:

Langan, Grossman, Kinney & Dwyer
809 Mony Plaza
Syracuse, New York 13202
BY: RICHARD D. GROSSMAN, ESQ.
-and-
JAMES F. DWYER, ESQ.

For the New York State Department of Conservation:

RICHARD J. BRICKWEDDE, ESQ.
Regional Attorney
Region 7

For the City of Syracuse:

Davoli & McMahon
800 State Tower Building
Syracuse, New York 13202
BY: JOSEPH F. DAVOLI, ESQ.
-and-
JAN SCOTT KUBLICK, ESQ.

I N D E X

Witness:	Direct
Edwin C. Tifft, Jr.	
By Mr. Grossman:	28
Franklin A. Borchardt	
By Mr. Grossman:	35
Slide Presentation:	37 - 84
R. Lee Torrens	
By Mr. Grossman:	87

compliance. It calls for certain sources to submit a plan for optimum operation of control equipment, perform routine maintenance inspections and maintain records. These records will aid in identifying potential problem areas. This should result in fewer upsets and equipment malfunctions, thereby decreasing actual emissions. Principles learned from O&M will be used in improving all of our inspection techniques.

Economic considerations will necessitate the conversion to more efficient combustion units. HCEPC and Tampa Electric Company (TECO) are actively implementing public awareness programs aimed at energy conservation. TECO is encouraging energy conservation with cash incentives aimed at saving county residents $680 million by 1990. The company estimates that the use of energy efficient appliances will eliminate one additional generator plant over the same period. Conservation paired with increased efficiency will result in a reduced growth rate for the entire fuel combustion source category.

Gardinier, Inc. is studying the possibility of converting its dry-rock crushing and grinding operation to wet-rock. In response to enforcement action initiated by HCEPC on June 14, 1979, General Portland Inc. has submitted an amended Emission Control Program Action Plan (Attachment VI). The plan commits General Portland, Inc. to the expenditure of over 3.3 million dollars for general design improvements, operational standards and procedures, and an extensive maintenance program. This plan has been initiated as scheduled. These moves combined will have an significant impact on the TSP generated by two major fugitive sources.

Florida Steel Corp., in response to EPA's Delayed Compliance Order (Attachment VII) November 1978, has installed an overhead canopy and baghouse system to control fugitive emissions from charging and tapping the electric arc furnaces. The system became fully operational July 1, 1979. This modification is estimated to reduce Florida Steel Corps. emissions 305 tons per year.

The Municipal Incinerator was closed December 1979 by order of EPA. Closing the incinerator resulted in a net TSP reduction of 833 tons per year. Municipal incineration for solid waste disposal may be resumed with adequate controls to insure that it does not impair our progress towards attainment.

With the selection of the fugitive dust strategy and with the expected emission reductions to be achieved by the closing of the Municipal Incinerator, the DCO for Florida Steel Corporation, and projected transportation improvements, a net 7.8% emission reduction was achieved:

	Estimated (tons/yr)
1. Emission Reduction from Transportation Improvements	368
2. Emission Reduction from Incinerator	833
3. Emission Reduction from Florida Steel DCO	305
4. Emission Reduction from Fugitive Dust Controls	1262
	2768 tons/yr or 7.8% of the annual TSP

According to 1977 air quality data, Sampling Stations Nos. 1, 63, 92, and 103 were found in violation of the annual average standard for TSP. These violations were registered as follows:

Station No.	Annual Geo. Avg. (ug/m^3)
1	65.55
63	61.74
92	67.31
103	66.68

Based on this information, it is necessary to develop a strict control

Receptor	Horizontal	Vertical	Concentration
226	357.2	3092.2	69
227	365.9	3089.9	66
228	365.1	3093.1	63
230	358.6	3091.9	66
231	356.8	3090.0	65

A three-dimensional graphic representation of this data can be found in Figure 10. This contouring was done using the SYMVU program. The same data in two-dimensional form, from the SYMAP Program is given in Figure 11.

The AQDM was used in order to quantify the impact of all sources on the stations in violation of NAAQS. Attachment VII contains the complete results of AQDM. Major contributors to these receptors are summarized by Table 6. The following summarizes the effects that could be expected from our projected emission reductions.

Control Strategies for Station 1

1.	Percent reduction from fugitive dust controls	5.77
2.	Percent reduction from the closing of the incinerator	12.66
3.	Percent reduction from DCO for Fla. Steel Corporation	0.09
4.	Percent reduction from transportation improvements	0.08
	Total Expected % Reduction	18.60%
	Needed % Emission Reduction	13.7 %
	Cushion	4.90%

Control Strategies for Station 63

1.	Percent reduction from fugitive dust controls	15.93
2.	Percent reduction from closing incinerator	5.93
3.	Percent reduction from DCO for Fla. Steel Corporation	0.0
4.	Percent reduction from transportation improvements	0.08
	Total Expected % Reduction	21.94%
	Needed % Emission Reduction	4.7 %
	Cushion	17.24%

Control Strategies for Station 92

1.	Percent reduction from fugitive dust controls	5.79
2.	Percent reduction from closing incinerator	7.49
3.	Percent reduction from Fla. Steel Corporation DCO	0.29
4.	Percent reduction from transportation improvements	.06
	Total Expected % Reduction	13.63%
	Needed % Emission Reduction	17.3 %
	Cushion	- 3.67%

RESOURCE RECOVERY REPORT

published by the Onondaga County Resource Recovery Management Team

Number 33 June 16, 1981

VENDOR CHOSEN: COSTS ANNOUNCED

The evaluation of vendor responses to Onondaga County's Request for Proposal has been completed. The following information sets forth the results of the evaluation of proposals received by the County on June 1, 1981. The proposals were in response to the Request for Proposal (RFP) issued by Onondaga County on February 16, 1981 in connection with the Resource Recovery Project at Rock Cut Road.

After the proposals were received, the Onondaga County Resource Recovery Management Team and its consultants spent two weeks in an evaluation process that reviewed technical, financial and economic factors related to the proposals.

Three qualified full-service companies submitted proposals to the County. They were:

- Browning-Ferris, Inc.
- UOP, Inc.
- Wheelabrator Frye, Inc.

Each holds the license or marketing rights to a different proven resource recovery technology developed in Europe. In the opinion of the County's consultants, these companies are considered to be the most prominent full-service vendors in the resource recovery industry today.

During the intensive evaluation, individual interviews were held with each company to review the analysis of their proposal to assure that all proposals would be compared on an equitable basis.

No significant discrepancies were identified and each proposer expressed their appreciation for the opportunity to review the analysis of thier proposal first hand before the evaluation was complete.

The capital costs summaries for all three firms plus the major guarantees to which each company has made a commitment are detailed in the following tabulation:

Facility Annual Cost Summary
(At 420,000 TPY Throughput)

	BFI	UOP	WFI
Bid Construction Price	$98,000,000	$77,552,000	$113,321,000
Cost Escalation	$23,900,000	$14,286,000	$26,549,000
Pass Through Costs During Startup	$210,000	$472,000	$798,000
Annual Debt Service Payment	$15,285,000	$10,935,000	$17,565,000
Operator Fees and Pass Through Costs	$5,498,000	$6,769,000	$7,242,000
Agency Revenues (Steam, Electric, Ferrous)	$8,040,000	$3,037,000	$8,764,000
Net Agency Facility Costs	$12,743,000	$9,667,000	$16,042,000

The annual cost summaries shown below produce the net agency facility costs at 420,000 tons per year.

	BFI	UOP	WFI
Capital Cost	$98,000,000	$77,652,000	$113,821,000
Operating Fee(s)			
Guaranteed Tonnage	$13.76	$13.67	$17.70
Excess Tonnage	2.32	12.30	5.00
Guarantees			
Construction Period (Months)	36	31	33
Plant Capacity			
Tons Per Year	434,000	420,000	438,000
Tons Per Week	9,600	9,800	10,500
Net Electrical Output At			
140,000 pph Stam Export (MW)	14.0	14.0	19.375
Ferrous Metal Efficiency	90%	85%	90%
Annual Residue Tons (Dry)	63,000	54,600	58,500
Maximum Steam Output	293,300 Lb/Hr	315,000 Lb/Hr	375,000 Lb/Hr

Based on July 1, 1981 Dollars.

RECOMMENDATION OF VENDOR

Following the receipt of proposals and interviews with the vendors, a rigorous and detailed evaluation procedure was completed, leading to the selection of a vendor. A detailed evaluation report will review all of the factors considered and will outline the selection process.

As a result of this process, the County Management Team and its Consultants are recommending the firm of UOP, Inc. to County Executive, John H. Mulroy, and the County Legislature for contract negotiations. The County Executive accepted that recommendation Monday and urged the legislature to study the proposal carefully.

OTHER RESOURCE RECOVERY COMPONENTS

A number of other system components are included in this resource recovery project.

Capital and operating costs have been estimated for these facilities on the basis of detailed preliminary plans developed by the engineering consultants. These costs are shown below.

SYSTEM CAPITAL + O&M COST ESTIMATES

Balance of System @ July 1, 1981 Costs

	Costs $ (in Millions)	
	Capital	O&M
Steam Transmission Line	14.5	0.03
Modifications to Auxiliary Energy Facilities - SU Steam Plant - County Steam Plant - SU Chilled Water Plant	1.2	1.13
Steam & Chilled Water Distribution System	2.0	0.75
Resource Recovery Plant Site County Responsibilities - Utility Lines - Scale House - Insurance	1.2	0.43
Environmental Considerations - Air Quality Monitoring - Community Services - Landscaping	1.5	0.60
Convenience Stations (8 sites)	0.6	0.10
Belle Isle Landf'll	2.0	0.70
Land & Facility Acquisitions	3.4	0.91
Planning, Engineering, Administration	8.0	0.50
Totals	$ 34.4	$ 5.15

TOTAL SYSTEM CONSTRUCTION COSTS

	7/1/81	Escalated to 8/1/84
Resource Recovery Plant	$ 77,652,000	$ 92,409,500
Balance of System	34,400,000	40,788,000
	$ 112,052,000	$ 133,197,500
State Bond Issue Grant Towards Construction Cost		17,100,000

REVENUE BOND ISSUE COMPONENTS

Gross Construction Cost		$ 116,097,500
Gross Interest Cost		40,496,900
Debt Service Reserve Fund		27,860,000
Financing Expenses		7,685,600
	Amount of Bonds	$ 192,140,000

The resulting tipping fee from the project is $15.85 in 1985. This figure is equivalent to $12.00 per ton in 1981 dollars. This compares with a $19.50 per ton tipping fee currently charged by the Solid Waste Disposal Authority. The project tipping fee if SWDA uses the Seneca Falls landfill after October 1, 1981 is more than $25.00.

NET SYSTEM REVENUE ESTIMATES
@ 400,000 tons per year

	1985 QUANTITY	1985 RATE	1985 REVENUE
Steam	906,500 M lbs	13.00	$ 10,974,000(2)
Chilled Water	5,000,000 th	0.400	2,000,000
Electricity	78,000,000 kwh	0.048	3,182,000(2)
Tipping Fees	400,000 t	15.85(1)	6,340,000
Landfill (Nonprocessable waste)	11,000 t	10.00	110,000
Recovered Materials - post incineration	23,800 t	10.00	36,000(2)
			$ 22,642,000

(1) Equivalent 1981 Tipping Fee = $12.11
(2) Reduced by Vendor Revenue Share
M lbs = thousand pounds
th = ton hour
kwh = kilowatt hour
t = ton

INFORMATION

For further information concerning the Onondaga County Resource Recovery Project, contact Donald Lawless, Public Information Coordinator at 425-3421, Linda D. Hickok or Gary Mastroeni at 425-2611.

COUNTY OF HILLSBOROUGH
POST OFFICE BOX 1110 TAMPA, FLORIDA 33601
WILLIAM C. TATUM, COUNTY ADMINISTRATOR

May 12, 1981

Mr. Lawrence A. George
Environmental Administrator
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. George:

Thank you for your April 8, 1981, response to our questions. In reviewing your statement concerning the use of offsets from the City of Tampa Municipal Incinerator, we have formulated additional considerations.

The basic reason you have presented for prohibiting the use of emissions from the municipal incinerator as offsets for the resource recovery incinerator conversion is the inclusion of the municipal incinerator shut-down in the non-attainment State Implementation Plan (SIP) revision of April 24, 1979. Subsequent to the filing of the SIP with EPA, revisions to the plan have been proposed by the local environmental program, the Hillsborough County Environmental Protection Commission (EPC). The most recent revision is currently being prepared by the EPC and refers to the eventual resumption of incineration by the municipal incinerator (pg. 7 of revised SIP, 1981). In addition, a modeling analysis of the impact of emissions from the proposed resource recovery incinerator conversion on monitoring stations referred to in the SIP shows that progress toward attainment would not be significantly impaired.

Statutorily, Section 17-2.12(3)(b)3a of the Florida Administrative Code would appear to support our request for offsets from the Tampa Municipal Incinerator. The section states that:

> "Any source, whose permit to operate at a specific location or within specified areas, has expired without timely renewal or transfer, or whose operating permit has been revoked, as provided for in chapter 17-4, is permanently shut down, for purposes of section 17-2.17. At the time that such source is so permanently shut down an amount of emission allowance equal to the Base Emission Limit (BEL) for that source, shall be added to the new source allowance for that non-attainment area."

Your office has informed us that no new facilities have submitted requests for use of the New Source Allowance for Total Suspended Particulates since the incinerator closing in December, 1979. We therefore feel the Base Emission Limit from the closed municipal incinerator should be available for use for the resource recovery incinerator conversion. We hope this additional information will permit you to amend your determination on the use of offsets from the closed municipal incinerator.

We feel that obtaining offsets for the incinerator emissions may have a significant impact on the permitting of our project and we would appreciate a timely comment from your office. Thank you for your further consideration in this matter.

Sincerely,

Joseph D. Murdoch

Joseph D. Murdoch
Resource Recovery Management Analyst
Division of Public Utilities and Safety

JDM:cmb

The following summarizes the [illegible] emission reductions. From HEPC SIP Proposal

Control Strategies for Station 1

			With Inc. Rehab
1.	Percent reduction from fugitive dust controls	5.77	5.77
2.	Percent reduction from the closing of the incinerator	12.66	11.14
3.	Percent reduction from DOO for Fla. Steel Corporation	0.09	0.09
4.	Percent reduction from transportation improvements	0.08	0.08
	Total Expected % Reduction	18.60%	17.08 %
	Needed % Emission Reduction	13.7 %	13.7%
	Cushion	4.90%	3.38%

Control Strategies for Station 63

1.	Percent reduction from fugitive dust controls	15.93	15.93
2.	Percent reduction from closing incinerator	5.93	5.49
3.	Percent reduction from DOO for Fla. Steel Corporation	0.0	0.0
4.	Percent reduction from transportation improvements	0.08	0.08
	Total Expected % Reduction	21.94%	21.50%
	Needed % Emission Reduction	4.7 %	4.7
	Cushion	17.24%	16.8 %

Control Strategies for Station 92

1.	Percent reduction from fugitive dust controls	5.79	5.79
2.	Percent reduction from closing incinerator	7.49	6.70
3.	Percent reduction from Fla. Steel Corporation DOO	0.29	0.29
4.	Percent reduction from transportation improvements	.06	0.06
	Total Expected % Reduction	13.63%	12.58%
	Needed % Emission Reduction	17.3 %	17.3
	Cushion	- 3.67%	-4.72%

This station is at the center of NAA. A control strategy for selected nearby paved roads will provide the necessary additional reductions.

Control Strategies for Station 103

			With Inc Rehab
1.	Percent reduction from fugitive dust controls	6.13	6.13
2.	Percent reduction from incinerator closure	14.02	12.48
3.	Percent reduction from Fla. Steel Corporation DCO	0.09	0.09
4.	Percent reduction from transportation improvements	0.07	0.07
	Total Expected % Reduction	20.31%	18.77%
	Needed % Emission Reduction	16.0 %	16.0%
	Cushion	4.31%	2.77%

MAINTENANCE OF THE NAAQS

Air quality modeling, as a technique to determine the expected TSP concentration from proposed constructions and modifications, will be useful in maintenance of the standard. We are now developing in-house expertise in this area. Applying selective modeling techniques will assist in evaluating additional control strategies, analyzing air quality violations, and locating monitors.

We are awaiting an EPA approved policy from FDER concerning application of Bubble Policy, Emissions Banking and Offsets. Use of these techniques will allow for growth of both new and existing industrial point sources while improving the ambient TSP concentration. Air Quality Modeling will be used to evaluate requests to apply these control strategies. Having this expertise in-house will also permit measurement of combined small sources. As our proficiency increases we intend to expand this modeling to include complex, area, and non-traditional sources in greater detail.

IMPACT OF REHABILITATED TAMPA INCINERATOR

1974 CRSTER Run

Input Data

Unit	Emission Rate Basis	Stk Ht	Diameter	Exit Vel.	Exit Temp	Vol Flow Rate	Part. Emission Rate
1	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
2	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
3	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
4	1.0 gm/s	45.72 m	1.35 m	21.30 m/s	500 °K	30.49 m^3/s	1.15 gm/s
		(150 ft)	(4.43 ft)	(70.ft/s)	(440 °F)	(65 K ACFM)	

	Stn 1	Stn 63	Stn 92	Stn 103	Worst
Annual Impact on Non-Compliance Monitors	.61 $\mu g/m^3$	.16 $\mu g/m^3$	.29/$\mu g/m^3$	.64 $\mu g/m^3$	.78 $\mu g/m^3$
Highest	5.2	2.0	4.1	3.2	6.0 mg/m^3
Second 24 hr	3.9	1.8	2.3	3.2	4.4 mg/m^3

HDR Henningson, Durham & Richardson

8404 Indian Hills Drive
Omaha, NE 68114
(402) 399-1000

May 12, 1981

MAY 1981
RECEIVED

Larry George
Departmental Regulation
Twin Towers Office Building
2600 Blair Store Road
Tallahassee, Florida 32031

Dear Mr. George:

Hillsborough County will be presenting the Department of Environmental Regulation (DER) with an application for permit under the regulations for the prevention of significant deterioration (PSD). The county is proposing to rehabilitate the Tampa incinerator into a resource recovery facility for the production of electricity. The facility will be a significant source under these regulations.

The information contained within is to familiarize the DER personnel with the project specifics. The goal of the May 15, 1981 meeting will be to obtain your thoughts on the direction we are taking toward the PSD application. The information included, will be used to discuss the PSD application, both state and federal, the New Source Review, and the State Air Permit.

It is hoped that we will come to an agreement concerning the requirements for the various applications.

Sincerely,

HENNINGSON, DURHAM & RICHARDSON, INC.

Easel Roberts

Easel Roberts
Solid Waste/Resource Recovery

ER:sr

Architecture
Engineering
Planning
Systems
Sciences

Alexandria
Atlanta
Austin
Charlotte
Chicago
Dallas
Denver
Helena
Houston
Knoxville
Minneapolis
Norfolk
Omaha
Pensacola
Phoenix
Santa Barbara
Seattle
Washington, D.C.

Background

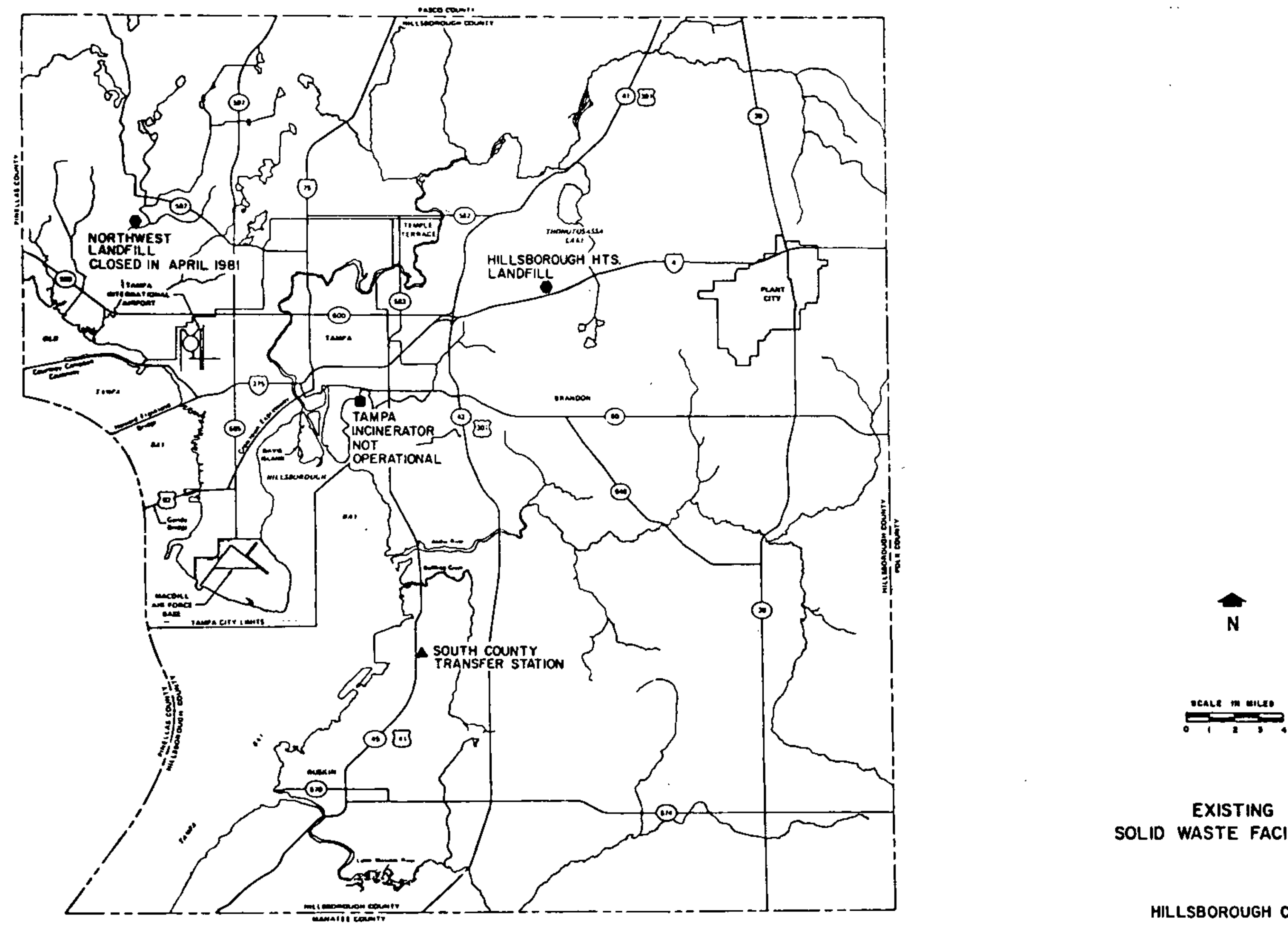
In Hillsborough County there has been an increased interest in solid waste disposal and the concept of resource recovery from solid wastes. This has been stimulated by an increased awareness of the environmental and siting problems associated with past disposal methods, and by the shortages and increased prices of energy and recyclable materials. Each of the cities in Hillsborough County maintains a solid waste collection system within its respective boundaries, while the County is responsible for the collection system in the unincorporated areas. Residential waste is usually collected twice a week, with more frequent collections for commercial waste.

The solid waste generated in Hillsborough County is currently disposed of in two landfills, the Northwest Landfill and the Hillsborough Heights Landfill. In previous years, other landfills were used, but are now closed. The Ruskin Landfill operated until August 1, 1978 when the waste they were handling was diverted to the Taylor Road Landfill. The Plant City Landfill operated until October 1, 1979 when this waste was diverted to the Taylor Road Landfill. The City of Tampa operated an incinerator until December 31, 1979 when it was closed because of air and water pollution problems. When this facility creased operation, those wastes were diverted to the Taylor Road Landfill also. Hillsborough Heights replaced the adjacent Taylor Road Landfill in February 1980. Figure 1 shows the locations of existing solid waste facilities in Hillsborough County.

Because of landfill capacity limitations and legal restrictions concerning these two operating sites, the County has initiated actions to site, design and permit a new landfill by March 1982. The new landfill will be used for both a residue disposal site for the proposed resource recovery system and as an emergency back-up system.

RESOURCE RECOVERY PLAN

In September 1980, the Board of County Commissioners of Hillsborough County approved a resource recovery plan to minimize solid waste management costs by converting the municipal solid waste to energy and secondary materials. The revenues from the energy and secondary materials would help decrease the total disposal cost.



EXISTING
SOLID WASTE FACILITIES

HILLSBOROUGH COUNTY

FIGURE 1

As presently envisioned, the resource recovery plan has three parts: 1) The siting of a new landfill; 2) rehabilitating and enlarging the existing Tampa Incinerator, and; 3) the construction of a new resource recovery facility. The only portion that needs to be discussed is the existing Tampa Incinerator.

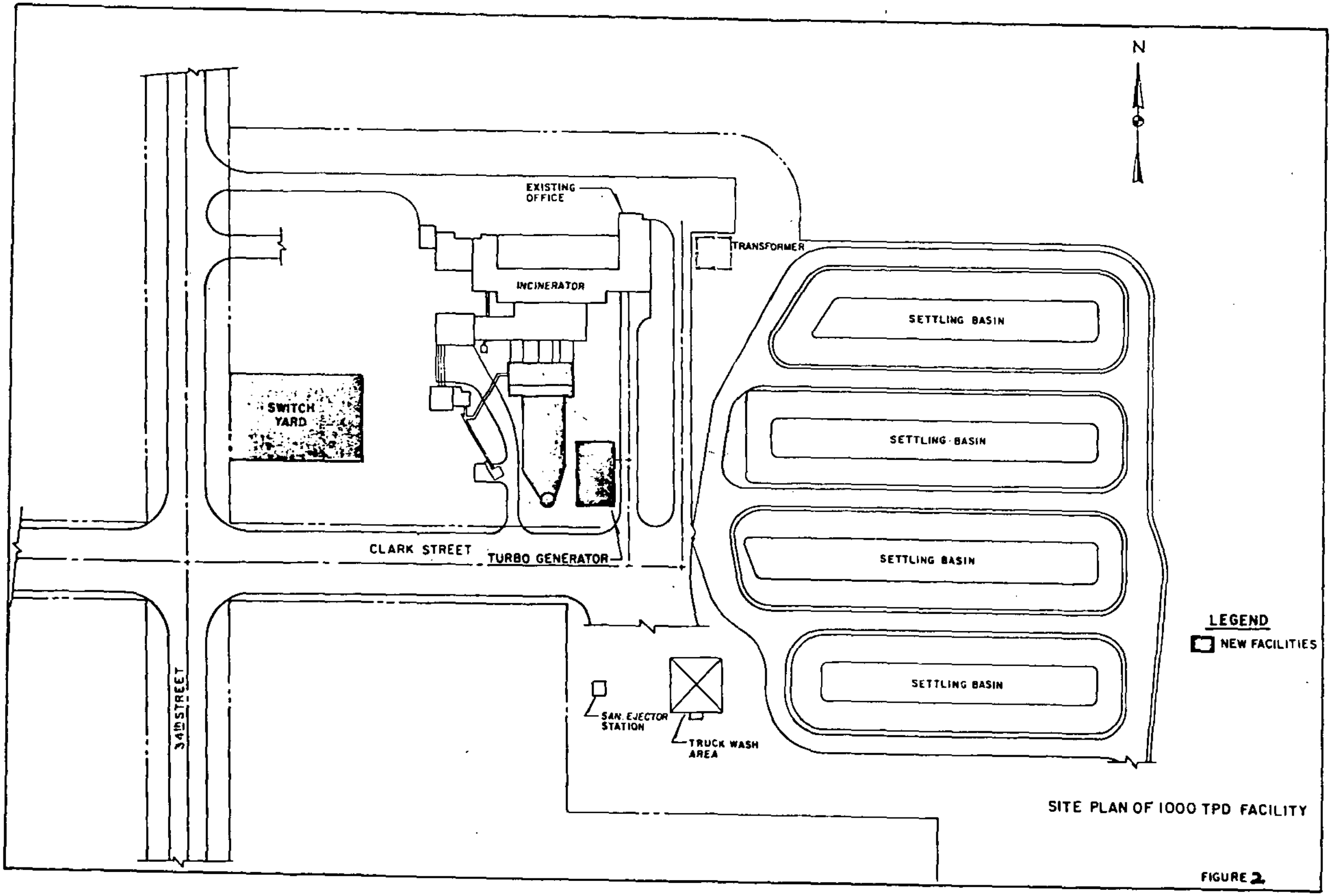
Tampa Incinerator

The Tampa Incinerator is located on a 14 acre site adjacent to McKay Bay south of Route U. S. 60. Figure 2 is the site plan of the Incinerator.

The incinerator system consists of three mas burn combustion trains without energy recovery, based upon the Volund technology. Each is rated at 250 TPD. Our design engineers have inspected the Incinerator, and it is our opinion that it can be rehabilitated and converted into a resource recovery system capable of generating electricity for sale to TECO. Figure 3 depicts a cross-section view of the existing equipment. To renovate the incinerator, waste heat boilers, electrostatic precipitators for particulate control, and turbine generators with all support equipments and instrumentation will have to be added. In addition, the inplace combustion system will have to be modified to bring the facility into guaranteed operating condition for long-term operation and incorporated design features of modern Volund systems.

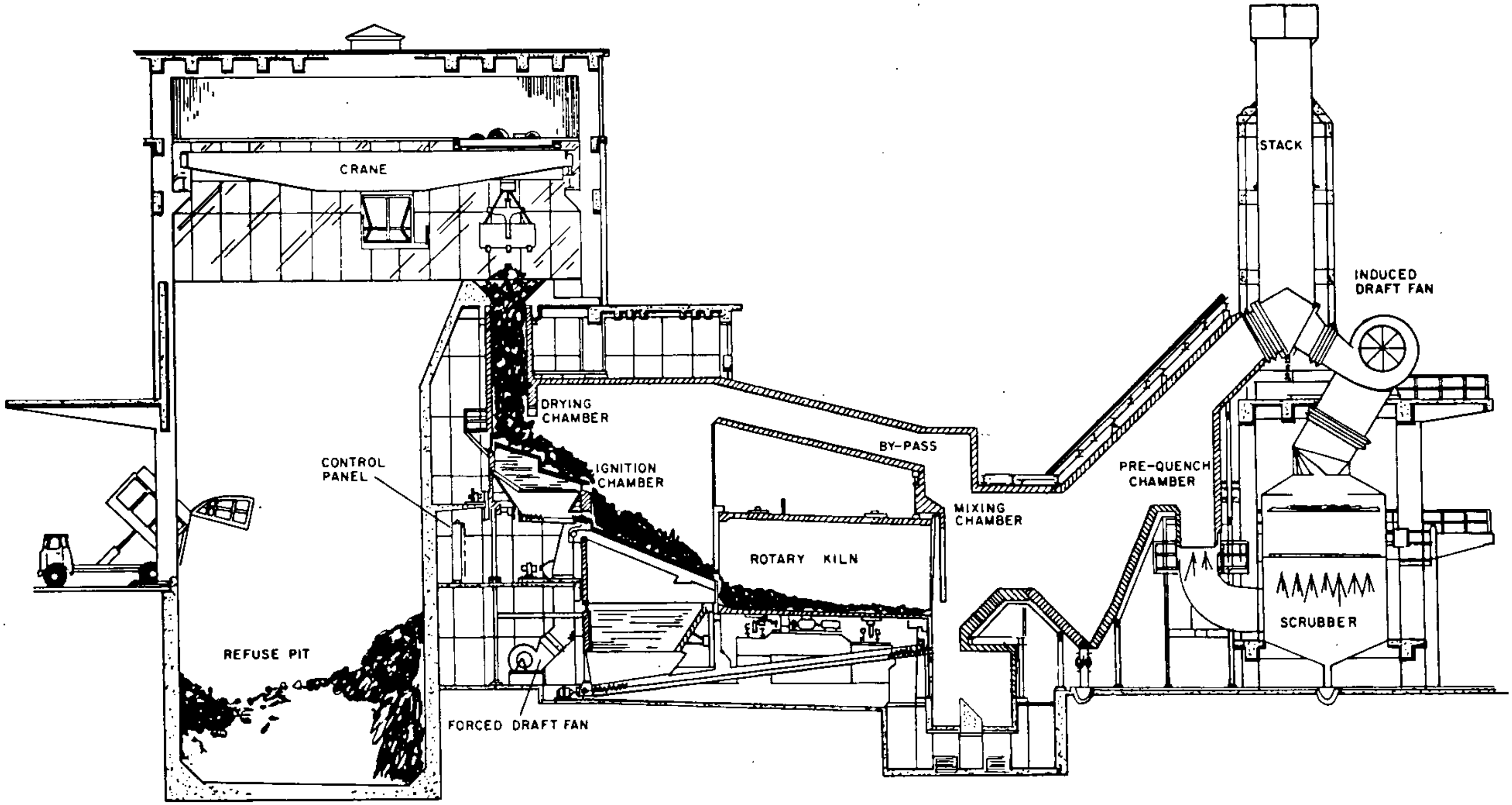
Figure 4 shows a potential equipment configuration, with a boiler and electrostatic precipitator added to the existing equipment.

Three combustion trains were initially constructed with adequate space left in the building including all foundations required to add a fourth unit at a later date. We are of the opinion that if the fourth unit were added, the design of the facility would be 1000 TPD, and by considering the online equipment availability, approximately 300,000 tons per year of solid waste would be disposed of by the facility.



SITE PLAN OF 1000 TPD FACILITY

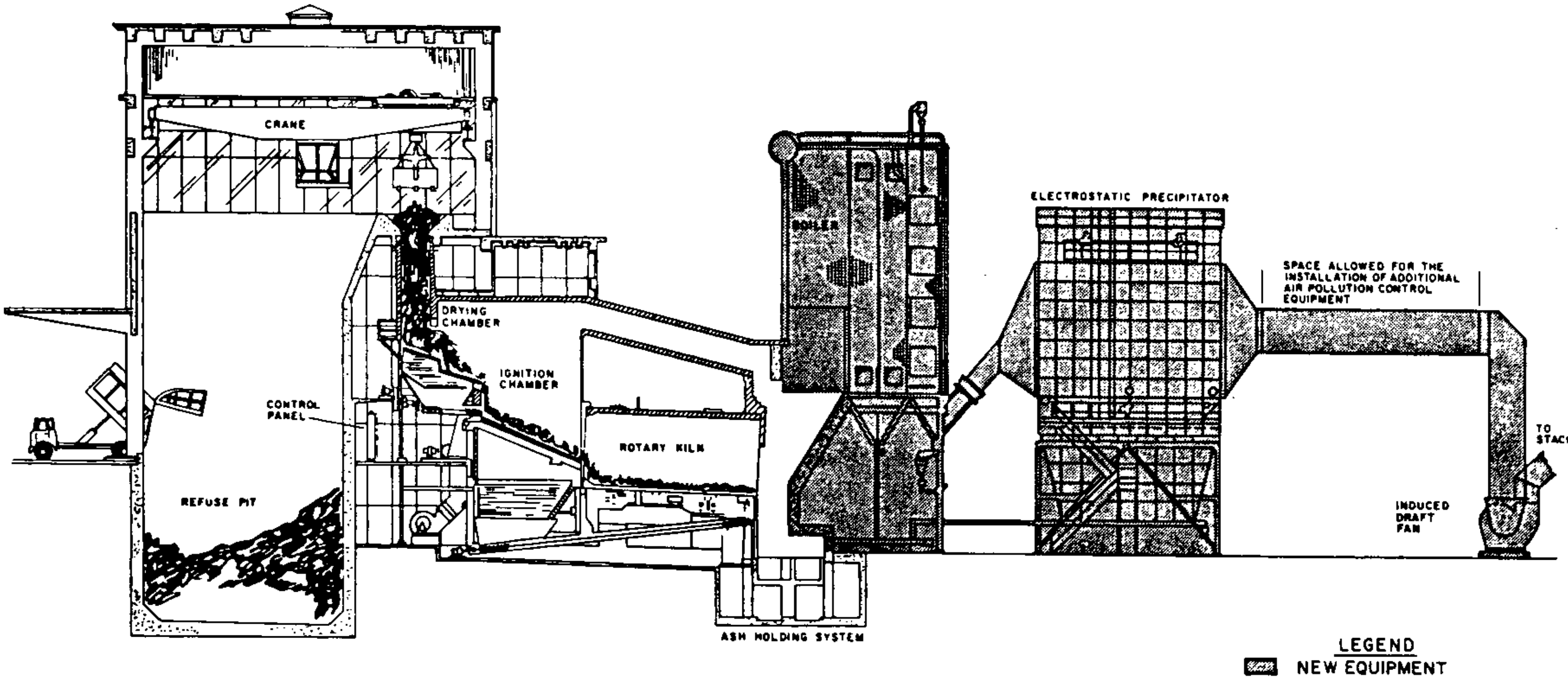
FIGURE 2



CROSS SECTIONAL VIEW OF
THE TAMPA INCINERATOR

SOURCE: INTERNATIONAL INCINERATOR INC.

Figure 3



CROSS SECTIONAL VIEW OF THE TAMPA INCINERATOR WITH RESOURCE RECOVERY EQUIPMENT ADDED

The steam generated by the four boilers added to the facility will be used to produce electricity in a 21 MW condensing turbine generator. All generation support systems will be provided to sustain operation on an annual operating schedule consistent with parameters used in the electrical utility industry.

Air emission generated by the combustion process will be controlled within accepted standards by a multi-cyclone mechanical separator and an electrostatic precipitator (ESP) for each incinerator/boiler train. The treated flue gas will be vented to the atmosphere through individual flues within a common chimney.

Ash produced by the combustion process will be handled by a wet system. The wet ash will be dewatered and loaded into trucks for subsequent disposal in the County's designated residue disposal site. On a dry basis, the ash quantity requiring landfilling is estimated to be a 15 percent by weight and 5 percent by volume of the input solid waste combusted.

Environmental Requirement Synopis

A. INTRODUCTION

Several environmental permits are required for Hillsborough County's proposed Resource Recovery Plan. The major purpose of the permits is to assure to the various regulatory agencies that the possible adverse effects of these projects will be minimized. The principle regulatory organizations that will be involved are the Florida Department of Environmental Regulation (DER), U. S. Environmental Protection Agency (EPA), the Hillsborough County Environmental Protection Commission (HCEPC), and the City of Tampa Water and Sewer Department.

B. ENVIRONMENTAL PERMIT REQUIREMENTS

The air quality review will vary for each facility and each potential pollutant. The emission of non-attainment pollutants, particulates (depending on location) and Volatile Organic Compounds (VOC) must comply with the Lowest Achievable Emission Rate

(LAER) rules. Both the Tampa Incinerator Conversion and the proposed electrical generation facility will need to undergo Prevention of significant Deterioration (PSD) review for Sulfur Dioxide, Lead, Beryllium, and Mercury.

The water quality permits required will depend on the method of effluent disposal. All wastewater effluents will be discharged to the City of Tampa's sewerage system, so a permit must be secured from the Tamp Water and Sewer Department.

Solid waste permits will be reviewed and administered by the Florida DER. A permit will be required for the whole project because it constitutes a solid waste disposal system and/or a change in disposal operations. Additional local permits will be required for construction of the proposed facility; however, they should not affect the project timing.

A list of the major permits to bee obtained and their respective preparation times are listed in Table 1.

TABLE 1
ENVIRONMENTAL PERMITS LIST

Air Quality	Review Agency	Preparation Time	Review Time Limit
Prevention of Significant Deterioration (PSD)	EPA, DER*	2 - 4 months	1 Year
New Source Review (LAER)	DER	Part of PSD	60 Days
Florida PSD	DER, HCEPC*	Equivalent to PSD	120 Days
Permit to Construct-Air	DER	1 Month	60 Days
Permit to Operate-Air	DER	1 Month	60 Days
Water Quality			
Permit to Construct-Water	DER	1 Month	60 Days
Permit to Operate-Water	DER	1 Month	60 Days
Industrial Wastewater	DER	1 Month	120 Days
City Sewers Usage Days	City of Tampa	1 Month	60 - 90
Solid Waste			
Permit to Construct-SW	DER	1 Month	60 Days
Permit to Operate-SW	DER	1 Month	60 Days
Other			
Notice to Construct	FAA	1 wk after designed	90 Days
Notice to Construct	State Aviation Authority	1 wk after designed	90 Days

* The DER is applying for full PSD authority. When full authority is granted the PSD application will be a signle application with a 120 day review time.

Lowest Achievable Emission Rate

Review of the air pollution rules of every state indicates the strictest emission limit on incinerators, is that from Illinois at 0.05 gr/dscf. This is being met by a few facilities in the Chicago. California has a stricter standard at .02 - .01 gr/dscf but no facility has attemped to construct under those conditions.

The BACT/LAER Clearinghouse reports have one entry under solid waste boilers. It is for the National Energy Corp. facility in Chicago. Conversations with Mr. Thayil of EPA Region V confirm that the report is in error and the facility was never built.

We support a LAER determination of 0.03 gr/dscf at 12% CO2 0.03 gr/dscf at 50% excess air. This will be achieved by an electrostatic precipitator. The number of field and vendor have yet to be determined.

Best Available Control Technology (BACT)

Municipal solid waste is an extremely low sulfur fuel. The SO_2 emissions are approximately .9 lb per million Btu. This equates to 0.2% Sulfur and 4500 Btu/lb. The BACT recommendation for SO_2 control will be the use of a low sulfer fuel. The other possible control technologies will be discussed.

Nitrogen Oxide control is still in its infancy. A few ammonia injection catylist systems are under development but none are yet commercial. The BACT recommendation will be good control on the overfire air, underfire air, and furnance temperature.

Modeling

To determine the level of modeling the screening procedures of the "Guidelines for Air Quality Maintenance Planning and Analysis, Vol 10, EPA, were used. The results are in the appendix and indicate that preapplication monitoring may not be required but futher modeling is. To fulfill the modeling requirements of the air quality analysis either the urban RAM or ISCST and ISCLT will be run. The default values will be used unless actual data exists or the DER recommends otherwise. The receptor spacing will be concentrated around the monitoring sites that are nonattainment monitors. The source information is in Table 2 from Waste Management Inc.

TABLE 2

SOURCE EMISSION DATA

	gr/dscf/unit	gms/unit	T/yr/unit	Total TPY
Particulate	0.03	1.15	39.9	160
Sulfur Dioxide	0.17	5.18	180	720
Nitrogen Oxides	0.22	6.53	227	907
Carbon Monoxide	0.008	0.42	15	60
Hydrocarbons	0.008	0.23	15	60
Berylium*	1.3 x 10 -7	0.00001	.005	.02
Lead*	6.1 x 10 -5	0.0046	.16	.64
Mercury*	3.0 x 10 -3	0.23	.79	3.2

Gas Exit Temperature	450° F	500° K
Gas Exit Velocity	70 ft/s	21.3 m/s
Volume acfm	70 K	
m3/s		30.7
Stack Diameter	4.43 ft.	1.35 m
Flues	4	4
Stack	150 ft.	45.7 m

*Approximated from EPA test at North Little Rock, Arkansas and Braintree, Massachusetts.

HDR Henningson, Durham & Richardson

8404 Indian Hills Drive
Omaha, NE 68114
(402) 399-1000

April 23, 1981

Pickens C. Talley, II
Hillsborough County
Divisions of Public Utilities and Safety
407 North East Street
Tampa, Florida 33601

Reference: Hillsborough County Resource Recovery Project
Executive Summary of Final System Configuration Report

Dear Mr. Talley:

Enclosed is an Executive Summary of our final System Configuration Report to guide the implementation of the referenced project. Also included at the end of the summary is the implementation schedule for the recommended alternative.

The recommended implementation schedule is obtainable. But, diligent efforts by your local decision makers are essential to fulfilling the stated community goals of minimizing the dependency on landfilling of solid waste, providing facilities to reduce landfilling requirements in the shortest possible timeframe, utilizing all or portions of the existing Tampa Incinerator, and providing an environmentally acceptable system for solid waste disposal.

The recommended and coincidently, least cost alternative is to rehabilitate the Tampa Incinerator into a modern (like new) 1000 tpd refuse-fired steam/power plant, and to construct on the same McKay Bay site, a second 1000 tpd companion facility. It is envisioned that both facilities would be financed by a single industrial revenue bond issue. The approximate bonded cost of the recommended alternative, based upon input from the team's investment bankers, is estimated to be $ 177,500,000.

The impact of delays on the project's economics are substantial. For example, using a 12 percent escalation rate, the increase in construction cost for each day the implementation process is delayed beyond the recommended schedule is $ 58,350. The magnitude of this increase only emphasizes the importance of knowledgeable participation by the local decision makers in the implementation program.

The preparation of this report encompassed considerable effort by your staff, the Resource Recovery Management Committee and other members of the County's consultant team. The cooperation of the entire team in reaching this milestone has been excellent. Furthermore, we and our associates are looking forward to continuing the implementation of your project per the enclosed schedule.

Sincerely,

HENNINGSON, DURHAM & RICHARDSON, INC.

R. Lee Torrens

R. Lee Torrens, P.E.
Assistant Vice President
Project Coordinator

Richard R Bell

Richard R. Bell, P.E.
Assistant Vice President
Project Manager

EXECUTIVE SUMMARY

The purpose of this report is to present to the Resource Recovery Management Committee and to the Board of County Commissioners a viable program which can be started immediately for procuring facilities to implement resource recovery in Hillsborough County. This report presents a recommended system configuration for those facilities which should be constructed in the immediate future and a recommended procedure and schedule for doing so. It also represents confirmation by the consultant team of the technical, legal, and financial bases for proceeding with program implementation.

To proceed from this point forward requires positive action by the Resource Recovery Management Committee and the Board of County Commissioners.

Background:

The Hillsborough County Board of County Commissioners and the Resource Recovery Management Committee representing the three cities have determined that resource recovery should be a major part of the long-range solution of solid waste disposal in the county. This determination was made following feasibility studies completed in 1979/80 which concluded that resource recovery is a viable long-range option. Specifically, the county board and the municipalities on September 17, 1980 adopted a program encompassing the five resource recovery facilities listed in the table below.

Subsequently, the county retained HDR to lead a team of engineers, investment bankers and legal counsel to implement the program. This report concludes the first step in the implementation process, that of: (a) confirming the technical, economical, financial, and legal bases for program development, (b) selection of the specific facilities to be included in the initial procurement, (c) confirmation of the energy market(s), (d) determination of overall system configuration, (e) preliminary work on the environmental permitting process, (f) preliminary analysis and recommendations on financing strategies, and (g) development of a detailed implementation schedule.

Facilities in the Selected Resource Recovery Plan

Facilities	Target Dates For Completed Facilities	Estimated Solid Waste Average Throughput (Tons Per Week)
Conversion of the City of Tampa Incinerator to a mass-burn electrical generating facility	1983	5,250
Construction of a refuse-fired electrical generating facility	1985	7,000
Construction of a modular incinerator for steam production, in Plant City	1983	315
Construction of a modular incinerator for steam production, at the University of South Florida	1984	1,050
Construction of a modular incinerator for steam production for breweries located in or adjacent to the Tampa Industrial Park	After 1985	1,375

Recommendations:

Based on our analysis of the technical, legal, financial, and other issues inherent in implementing resource recovery; we have concluded that the best and recommended, course of action for Hillsborough County is to begin immediately with procurement of two 1,000 tpd refuse-to-energy facilities, both located at the site of the existing Tampa Incinerator. Subsequently, at a time not yet certain, we believe it may be advantageous for the county to procure additional, smaller facilities in other locations.

Specific recommendations for procurement of the first two facilities are as follows:

1. It is recommended that the existing 750 tpd Tampa Incinerator be rehabilitated to convert it to a 1,000 tpd refuse-fired steam/power plant with appropriate air pollution control equipment.

2. It is recommended that the contract for the rehabilitation/conversion project be with a full-service vendor who has the experience and resources and who can and will guarantee the facility as a "like new" facility, and who will also contract for 20-25 year operation of the facility with guaranteed operation and maintenance (O & M) costs, guaranteed capacity availability, guaranteed power output.

3. Because, in our opinion, there is only one vendor that can realistically be expected to enter into and fulfill a contract with the conditions stated in Recommendation No. 2, we further recommend Waste Management Inc/Volund USA Ltd for sole source negotiations for construction and long term operation of the rehabilitated facility.

4. It is recommended that the county proceed concurrently with full service competitive procurement of a second 1,000 tpd facility, also located at the existing Tampa Incinerator site.

5. It is recommended that a single revenue bond financing be used to obtain the development and construction funds for both projects. If done in this manner, limited interim financing will be necessary to enable the incinerator conversion project to begin while the contracts for the second facility and the financing for the overall package are developed.

6. It is recommended that the environmental studies and the permitting process for the two facility complex be started immediately.

7. It is recommended that a transfer station to serve Plant City be included and financed in the overall program.

8. It is recommended that future procurement of other smaller facilities be periodically re-evaluated as the program develops to determine the most advantageous time and location for such facilities considering waste generation, area development, and competitive energy costs for target energy markets.

It is our conclusion that the recommended program will save 9-12 months time in reconstruction of the Tampa Incinerator. When translated to dollars, this will reduce the size of the bond issue by approximately $18 million and will reduce the disposal cost in the first year of full system operation by approximately $6/ton or an annual savings of $3.6 million dollars.

The project costs to implement the recommended system are as follows:

1981 Construction Cost	
Tampa Incinerator Conversion	$ 42,725,000*
New 1,000 tpd Facility	47,775,000
	$ 90,500,000
Cost Escalation During Project Development	$ 26,500,000
Total Required Capital For Construction	$ 117,000,000
Financing and Other Costs	$ 60,500,000
Total Bond Issue	$ 177,500,000

* Includes payment of the outstanding bonded indebtedness of the existing Tampa Incinerator.

With the recommended approach, we believe the Tampa Incinerator conversion can be completed by late 1983 or early 1984 and that the second, new companion facility can be on-line in late 1985.

Following in topical summary format are the key issues and conclusions which form the rationale for the recommendations.

Waste Quantity:

Based on a review of previous studies and comparison of that data with new, scaled weight data which has become available since those studies, we have concluded that current and projected waste quantities support the recommendations to construct two 1,000 tpd resource recovery facilities. Indeed, the more recent data indicates that the annual disposal requirements could exceed the capabilities of the 2,000 tpd system by 1986. Nonetheless, prudence dictates that the facilities be sized conservatively, i.e. on the smaller side to assure full utilization to the maximum extent. Resource recovery facility economics are extremely sensitive to waste volumes and utilization ratios. If continuing studies confirm the trend towards more than 2,000 tpd of waste in the county by 1986, several possibilities exist for handling the overage. First, the two primary facilities can be operated at rates somewhat in excess of design capacity for short periods. Second, additional smaller facilities could be procured in the 1987/90 time frame. And third, excess quantities can be handled at the residue landfill. So, with the recommended facility sizes, the county is protected on all fronts.

Waste Flow Control:

At present, the county does not have control over waste disposed of within the county. Interlocal agreements have been executed which will be helpful in this issue but which may also be inadequate assurance for marketing the bond issue. Therefore, legislation has been proposed which will alleviate this concern and provide a better, more secure basis for Industrial Revenue Bond (IRB) financing.

Energy Market:

We have confirmed that the best long-range energy market for the primary facility(s) is, as reported previously, the sale of electricity to the Tampa Electric Company (TECO). Other markets exist for both electricity and steam but for various reasons they are less viable as a long-term committed market. All of the others are smaller markets, and none is sufficient to take all of the energy output from the recommended facilities. Finally, the present alternate (competitive) energy costs at these other markets is such that they are not competitive with the TECO market. As conditions change and energy costs continue to escalate, it is quite likely that the economic viability of additional smaller facilities added to the overall resource recovery system for the county, will improve. And, in the 1987/90 time frame, it looks now like additional facilities may be required.

System Configuration:

The least cost and recommended alternative for immediate procurement is to (1) rehabilitate the existing Tampa Incinerator at an increased capability of 1,000 tpd and with the addition of energy recovery and air pollution control equipment; and (2) construct a second 1,000 tpd refuse-to-energy facility on the same McKay Bay site. Construction of a transfer station at Plant City is also recommended.

There are overwhelming advantages to this approach, all of which are discussed in detail in the System Configuration Report. They are briefly synopsized below.

1. The recommended configuration and implementation schedule is the least cost approach. The following table shows the Bond Issue and Debt Service Costs for all alternatives. This results from the following factors:

   (a) Lowest total capital cost
   (b) Earliest possible bonding
   (c) Lowest bonding cost
   (d) Earliest opportunity for commercial operation
   (e) Lowest O & M cost

Bond Issue and Debt Service Cost by Alternative
($ x 1000)

	Alternative 1			Alternative 2			Alt. 3	Alt. 4	Alt. 5	Alternative 6	
	Tampa Incinerator	New Resource Recovery Facility	Small Modular Incinerator	Tampa Incinerator	New Resource Recovery Facility	Small Modular Incinerator	Tampa Incinerator	New Resource Recovery Facility	Tampa Incinerator	Tampa Incinerator	New Resource Recovery Facility
Design Capacity (tpd)	750	1,150	100	1,000	900	100	2,000	2,000	2-1,000	750	1,250
Site Location	McKay Bay	New Site	New Site	McKay Bay	New Site	New Site	McKay Bay	New Site	McKay Bay	McKay Bay	New Site
1981 Capital Cost	35,000	55,025	2,500	42,725	47,500	2,500	90,800	90,800	90,500	35,000	59,225
Cost Escalation	9,000	25,275	900	10,875	21,800	900	30,900	41,700	26,500	9,000	27,175
Total Required Capital	44,000	80,300	3,400	53,600	69,300	3,400	121,700	132,500	117,000	44,000	86,400
Interest During Construction	14,700	41,000	1,130	17,800	35,400	1,130	62,200	67,800	61,300	14,700	44,200
Bond Discount/Issuance	1,900	3,900	150	2,300	3,100	150	5,400	5,900	5,300	1,900	3,800
Debt Service Reserve Fund	8,300	15,400	640	10,100	13,400	640	23,400	25,500	23,000	8,300	16,600
Reserve & Contingency Fund	3,300	6,100	250	4,000	5,400	250	9,400	10,200	9,200	3,300	6,700
Investment Earnings	(8,500)	(27,700)	(670)	(10,300)	(23,900)	(670)	(41,700)	(45,500)	(38,300)	(8,500)	(29,600)
Total Bond Issue	63,700	119,000	4,900	77,500	102,700	4,900	180,400	196,400	177,500	63,700	128,000
Annual Debt Service	8,300	15,400	640	10,100	13,400	640	23,400	25,500	23,000	8,300	16,600
Total Bond Issue		187,600			185,400		180,400	196,400	177,500	191,700	

NOTE: (1) All alternatives have a 2,000 tpd design capacity.

(2) Annual debt service is based upon 11.5% - 20 year amortization rate.

(f) Minimum transportation cost

2. The recommended program, with two facilities, side by side, both with multiple units, has the highest degree of flexibility/redundancy.

3. Location of both facilities on one site of the existing incinerator allows the County to take advantage of the following:

   (a) An air emissions inventory, already on the books, that allows the two new facilities to take advantage of the tradeoffs available from the former facility.

   (b) Continued maximum beneficial utilization of a site that has a history of use as a solid waste disposal location in the County.

   (c) Excellent access to highway, rail and waterway transportation.

   (d) All major facilities located in close proximity to the centroid of present and future waste generation.

   (e) All major facilities located in relatively close proximity to the potential future residue disposal sites as identified by the current companion landfill siting/design project.

   (f) Location of both facilities on this single site is environmentally feasible.

   (g) Permitting of the two facilities is simplified and materially enhanced by the single location and one permitting process.

   (h) The electrical intertie between the facility(s) and TECO is simplified.

(i) The potential availability of the Hooker's Point Advanced Wastewater Treatment Plant effluent as a source of cooling water.

Facility Procurement:

After analyzing all of the alternatives, we have concluded that the best option for procuring rehabilitation and expansion of the existing incinerator is via sole source negotiations with Waste Management Inc/Volund USA Ltd. It is our opinion that the county's objectives of (1) getting a facility on-line in 1984, and (2) having that facility constructed and operated for 20 years by a firm that can and will guarantee the performance of the facility, can best be accomplished in this manner.

It is recommended that procurement of the second facility be via the competitive full-service proposal process which should be initiated immediately if the desired goal of having the second facility on-line in 1986 is to be realized.

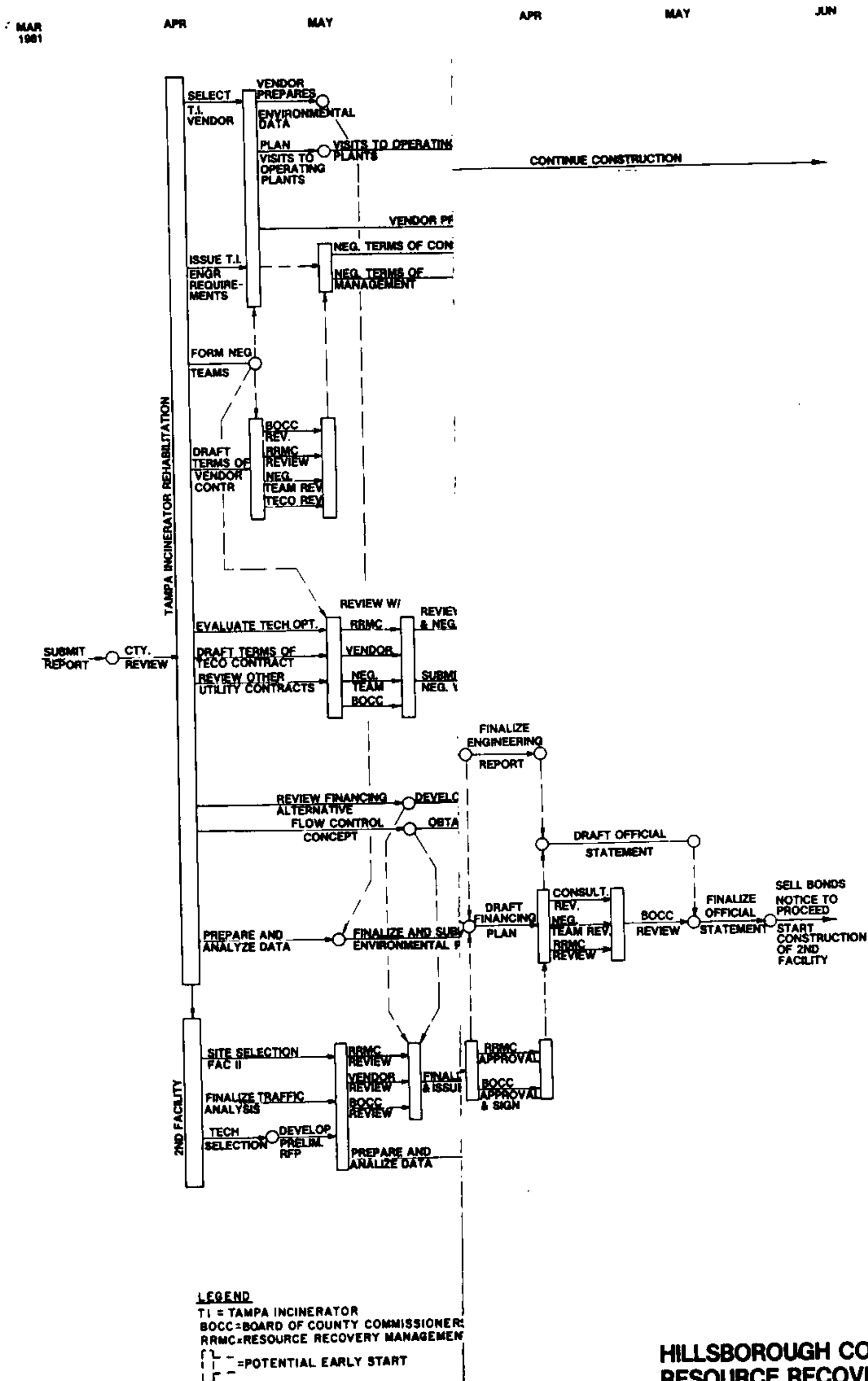
Design and construction or full-service procurement, of the transfer station of Plant City can be accomplished while the two principle facilities are being procured/constructed.

Facility Financing:

The method of financing recommended by the project financial advisors for procuring the required facilities, including the transfer station at Plant City and a landfill for residue disposal, is utilization of tax exempt industrial revenue bonds (IRB). However, there are potential limitations to this financing mechanism, especially with regard to including components of the system (facility) which are judged to be "nonpollution control" items. Examples of such items would include turbine generators, electric tie-lines and steam transmission lines. This limitation, plus the flow control mechanism to be employed could be somewhat complicated when applied to the financing of two facilities at different times. Therefore, it is recommended that the time schedule for procurement of the two recommended facilities - on the same site, be compressed such that they can be both included in a single bond issue as one project.

Project Schedule:

The attached flow chart shows the overall schedule for critical activities, including issuance and analysis of procurement documents, negotiations with contractors/vendors and TECO, environmental monitoring and permit applications, preparation of environmental impact reports and construction of the facilities.



HILLSBOROUGH COUNTY RESOURCE RECOVERY IMPLEMENTATION PLAN

John Svec

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

April 8, 1981

Mr. Joseph D. Murdock
Management Analyst
Resource Recovery Program
Hillsborough County Division of Public
Utilities and Safety
P. O. Box 1110
Tampa, Florida 33601

Dear Mr. Murdock:

We have investigated the questions you posed in our meeting of January 30, 1981, and your letter of February 18, 1981, regarding reactivation and conversion of the Hillsborough County incinerator. The following summarizes our positions on the questions that have been raised.

The nonattainment plans for both particulate and ozone include the reduction of emissions resulting from the shut-down of the incinerator in the respective reasonable further progress (RFP) schedules. Shut-down of the facility is included in the nonattainment State Implementation Plan (SIP) revision which was submitted to EPA on April 24, 1979. Therefore, no emissions remain from the operation of the incinerator which can be used for offset purposes. Also, since there is no valid operating permit for the incinerator, the resource recovery facility is considered a new source pursuant to Section 17-2.19 F.A.C. and must meet the permitting requirements of Section 17-2.17 F.A.C.

For purposes of estimating hydrocarbon emissions, only volatile organic compounds (VOC) as defined in Section 17-2.02 F.A.C. must be quantified. Nonreactive hydrocarbons and the exempt VOC as specified in 17-2.17(3)(a)2. F.A.C. are not considered to contribute to ozone generation and need not be included in the emissions estimate. VOC emissions may be measured using EPA's proposed Method 25.

The ozone nonattainment plan for Hillsborough County provides for a greater reduction of VOC emissions than is needed to demonstrate attainment of the ambient air quality standard. Part of this excess emissions reduction is allocated as a new source allowance which is available to sources needing offsets. Currently 500 tons per year of VOC emissions are available as new source allowance.

For particulate emissions there is also the potential for a new source allowance. As of this date there have been no source shut-downs in the nonattainment area that could be designated as providing new source allowance; however, Gardinier Chemicals has been issued a construction permit which requires the future shut-down of various particulate emitting sources. The schedule in the permit calls for a number of these sources to be closed by April, 1982; hence, this may be a potential source of offsets for the resource recovery facility.

Inasmuch as the resource recovery facility is considered a new source under the nonattainment rules, we consider it a new source under the federal PSD rules as well. When the incinerator closed, however the impact was removed from the SO_2 baseline thus expanding the available SO_2 increment.

We trust this answers the questions encountered thus far in formulating this project. If there are additional questions, please write or telephone me or John Svec at (904) 488-1344.

Sincerely,

Larry George

Lawrence A. George
Environmental Administrator

cc: Easel Roberts, H.D.R. Consultants
Dan Williams, Southwest District
Frank Shindle, H.C.E.P.C.
Mary Clark
John Svec

LAG:caa

HDR Henningson, Durham & Richardson
... Hills Drive
... 68114
... 1000

January 9, 1981

Larry George
Permit Section
FL DER
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. George:

This is to confirm the meeting date we set on January 9. I will arrive in town at 9:00 a.m. and can be at your office by 1:30 p.m. In this meeting, I would like to discuss the proposed Hillsborough Resource Recovery Facilities.

The study that will determine the final configuration of facilities is now underway. Previous studies have determined that up to five facilities could be included in the system, as follows:

(1) Conversion of the existing 5,250 tpw Tampa incinerator to a mass-burning electrical generating facility. Closed since Dec '79

(2) Construction of a new 7,000 tpw refuse-fired electrical generating facility.

(3) Construction of a 315 tpw modular incinerator for steam production in Plant City.

(4) Construction of a 1,050 tpw modular incinerator for steam production at the University of South Florida.

(5) Construction of a 1,375 tpw modular incinerator for steam production for breweries located in or adjacent to Tampa Industrial Park.

Tables 1 and 2 shows the best emission data that is presently available. It was derived from similar projects that are underway, such as the Pinellas County Facility.

Alexandria
Atlanta
Austin
Charlotte
Chicago
Dallas
Denver
Helena
Houston
Knoxville
Minneapolis
Norfolk
Omaha
Pensacola
Phoenix
Santa Barbara
Seattle
Washington, D.C.

Table 1 Expected Pollutant Emissions (TPY)

Pollutant	Components 5250 TPW Tampa Incinerator	7000 TPW	1375 TPW	1050 TPW	315 TPW
Particulate					
uncontrolled	5140 98%	6919 98%	1384 98%	1040 98%	311 98%
controlled	104	140	28	21	6.3
Sulfur Dioxide	350 – 1094 ← based on 8 lb/ton (a Pinellas Unit)	1460	292	219	66
Nitrogen Oxide	443	590	118	89	27
Carbon Monoxide	29	38	7.6	5.7	1.7
Non-Methane Hydrocarbon	206	274	55	41	12
Lead					
uncontrolled	60.7	81	16	12	3.6
controlled	1.5 97.5	2.0 97.5	.40 97.5	.30 97.5	.09 97.5
	1.18%	1.17%	1.16%	1.15%	1.16%

Table II

Emission Factors

Pollutant	Factor lb/Ton	
Particulate	51.4 (uncontrolled)	1.04 controlled
Sulfur Dioxide	2.56 ← EPA figure	
Nitrogen Oxide	2.8	
Carbon Monoxide	.447	
Non-Methane Hydrocarbons	.231	
Lead	.607 uncontrolled	.015 controlled

The following are a list of items that will need discussing:

1) The area is non-attainment for particulate and ozone. The NSR for particulate will require LAER. How is this to be determined?

2) The source will be a significant source for hydrocarbons, is this the same as the DER for VOC?

3) Can the PSD process be done in two steps; 1) with preliminary data, and 2) resubmit with final data?

4) Are there recognized "Hotspots" for particulate that should be part of the modeling receptor grid?

Sincerely,

HENNINGSON, DURHAM & RICHARDSON

Easel Roberts

Easel Roberts
Chemical Engineer

ER:wt

cc: Dick Bell