# EMISSIONS TEST REPORT
# OXIDES OF NITROGEN
# JULY 16-19, 2001
# HOOKERS POINT STATION
# DIESEL COMBUSTION ENGINE GENERATOR SETS
# UNITS 26 - 30

Prepared For:
Tampa Electric Company

Prepared By:
Environmental Affairs Department
of

Tampa Electric Company

TECO
TAMPA ELECTRIC

Environmental Services
Air Services Group
5010 Causeway Boulevard
Tampa, Florida 33619- 6130

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# JULY 16-19, 2001
# TAMPA ELECTRIC COMPANY
# HOOKERS POINT STATION
# FACILITY ID NUMBER: 0570038
# UNITS 26 - 30

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Prepared For:
Tampa Electric Company
Hookers Point Power Station
1700 Hemlock Street
Tampa, Florida 33601

Prepared By:
Tampa Electric Company
Environmental Affairs Department
Environmental Services, Air Services Group

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5010 Causeway Boulevard
Tampa, Florida 33619- 6130

## REPORT CERTIFICATION

I have reviewed the test performance, the resulting calculations, and contents of this report, and verified that all project quality objectives have been met.

Date 8/15/2001 Signature _____

Senior Environmental Technician
Quality Assurance/Quality Control Specialist
Air Services
Environmental Affairs
Tampa Electric Company

The sampling, analysis and calculations performed for this report were carried out under my direction. I have reviewed the results of this test report and I hereby certify that this test report is authentic and accurate to the best of my knowledge.

Date 8/15/01 Signature _____

Coordinator – Air Services
Environmental Services
Environmental Affairs
Tampa Electric Company

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## 1.0 SUMMARY OF RESULTS

On July 16 through July 19, 2001, the Environmental Services group of Tampa Electric Company performed initial $NO_x$ source emission tests on five (5) randomly selected Caterpillar SR4B generators, located at Hookers Point Station. The generators selected were units 26 through 30, operating on diesel fuel with a full load generating capacity of 1.825 megawatts each. Testing was conducted according to United States Environmental Protection Agency (USEPA) test methods stipulated in 40 CFR Part 60, Appendix A and air construction permit ARMS 0570038-002-AC.

The initial Nitrogen Oxides ($NO_x$) emission concentration for unit 26 was derived from three test runs. The calculated average was 564 ppmvd, and the corresponding emission rate was 38.2 pounds per hour at an average exhaust temperature of 851 degrees Fahrenheit. The Florida Department of Environmental Protection (FDEP) permit limit is 53 pounds per hour. The average opacity observed during the thirty minute visible emissions test was 6 percent. The FDEP permit limit is 20 percent.

The initial $NO_x$ emission concentration for unit 27 was derived from three test runs. The calculated average was 568 ppmvd, and the corresponding emission rate was 39.2 pounds per hour at an average exhaust temperature of 828 degrees Fahrenheit. The FDEP permit limit is 53 pounds per hour. The average opacity observed during the thirty minute visible emissions test was 6 percent. The FDEP permit limit is 20 percent.

The initial $NO_x$ emission concentration for unit 28 was derived from three test runs. The calculated average was 540 ppmvd, and the corresponding emission rate was 36.8 pounds per hour at an average exhaust temperature of 850 degrees Fahrenheit. The FDEP permit limit is 53 pounds per hour. The average opacity observed during the thirty minute visible emissions test was 5 percent. The FDEP permit limit is 20 percent.

The initial $NO_x$ emission concentration for unit 29 was derived from three test runs. The calculated average was 557 ppmvd, and the corresponding emission rate was 36.3

pounds per hour at an average exhaust temperature of 905 degrees Fahrenheit. The FDEP permit limit is 53 pounds per hour. The average opacity observed during the thirty minute visible emissions test was 6 percent. The FDEP permit limit is 20 percent.

The initial $NO_x$ emission concentration for unit 30 was derived from three test runs. The calculated average was 569 ppmvd, and the corresponding emission rate was 38.8 pounds per hour at an average exhaust temperature of 847 degrees Fahrenheit. The FDEP permit limit is 53 pounds per hour. The average opacity observed during the thirty minute visible emissions test was 5 percent. The FDEP permit limit is 20 percent.

During the tests on July 18, 2001, each combustion engine was operated at an average load of 1,825 kilowatts and the average quantity of fuel burned was 123 gallons per hour of diesel fuel.

## 2.0 SOURCE DESCRIPTION/TEST PROCEDURES

The Caterpillar generator field of thirty power modules is located at the Hookers Point Station on Hemlock Street, Tampa, Florida at UTM coordinates East 358.0 North 3091.0. Each generating unit, XQ2000 Power Module, consists of a 4-stroke cycle diesel engine with a generation capacity of 1.825 megawatts or a total generation capacity of 54.75 megawatts. Source sampling was performed from the rectangular exhaust vent on the roof of each engine compartment housed in a semi-tractor trailer.

Nitrogen Oxides sampling was performed in accordance with USEPA Reference Method 7E (40 CFR Part 60, Appendix A) "Determination of Nitrogen Oxides Emissions from Stationary Sources". Testing was performed using an Advanced Pollution Instruments model 200AH Chemiluminescent $NO$-$NO_2$-$NO_x$ Gas Analyzer.

A visible emission test was performed using FDEP Method 9 "Visual Determination of the Opacity of Emissions from Stationary Sources".

**TCEMS Description**

The following discussion briefly outlines the operation principles of Environmental Services Transportable Continuous Emissions Monitoring System (TCEMS). Additional information on instrument operation may be found in the individual instrument manuals provided by the manufacturers. A schematic of the TCEMS set-up is presented in Figure 1.

## Advanced Pollution Instruments Model 200AH $NO/NO_x$ Analyzer

The Advanced Pollution Instruments model 200AH $NO/NO_x$ analyzer automatically and continuously determines the concentration of nitric oxide (NO) and/or oxides of nitrogen ($NO_x$) in a flowing gas mixture. The analytical technique is chemiluminescence.

To measure NO concentrations, the gas sample to be analyzed is blended with ozone ($O_3$) in a reaction chamber. The resulting chemiluminescence activity is monitored through an optical filter by a high sensitivity photomultiplier tube positioned at one end of the chamber.

This filter and photomultiplier combination responds to light of a narrow wavelength band unique to the $NO/O_3$ reaction, producing an interference free signal. The output from the photomultiplier is linearly proportional to the NO concentration.

To measure $NO_x$ concentrations (i.e., NO plus $NO_2$), the sample gas flow is diverted through an $NO_2$-to-NO converter. The Chemiluminescent action in the reaction chamber to the converter effluent is linearly proportional to the $NO_x$ concentration entering the converter.

## Data Acquisition System

The data acquisition system (DAS) developed by Entropy Environmentalists Inc., uses a portable personal computer with an internal 32 bit analog-to-digital converter with an external 16 channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS can average data, calculate emission rates, and document analyzer calibrations. The test results and calibrations are stored on the hard disk and printed on a dot matrix printer.

## TCEMS Sample Handling System

The extractive monitors utilized in the TCEMS require that the effluent stream be conditioned to eliminate any possible interference (i.e., water vapor and particulate matter), before being transported and injected into each analyzer. Figure 1 depicts a schematic of the entire sample handling system. The major components of this system are listed below:

- Gas transport tubing
- Moisture removal system
- Sampling pump

## Gas Transport Tubing

Two separate 1/4 inch O.D. Teflon tubes were used for the sample gas transport.

## Moisture Removal System

The moisture removal system was comprised of an ice bath condenser, constructed of a 30-foot section of 3/8 inch O.D. Teflon tubing wrapped in a 12-inch coil. Effluent travels through this coil and then passes, in series, through two stainless steel moisture traps where the condensate drops out and is removed via a condensate discharge pump. With the exception of the discharge pump, the entire assembly is chilled in an ice bath.

## Sampling Pump

The Thomas Model 2107CE20-TFE pump is used to transport the effluent sample through the conditioning system to the analyzers. All internal parts of the pump that come into contact with the gas sample are constructed of 316 stainless steel or Teflon.

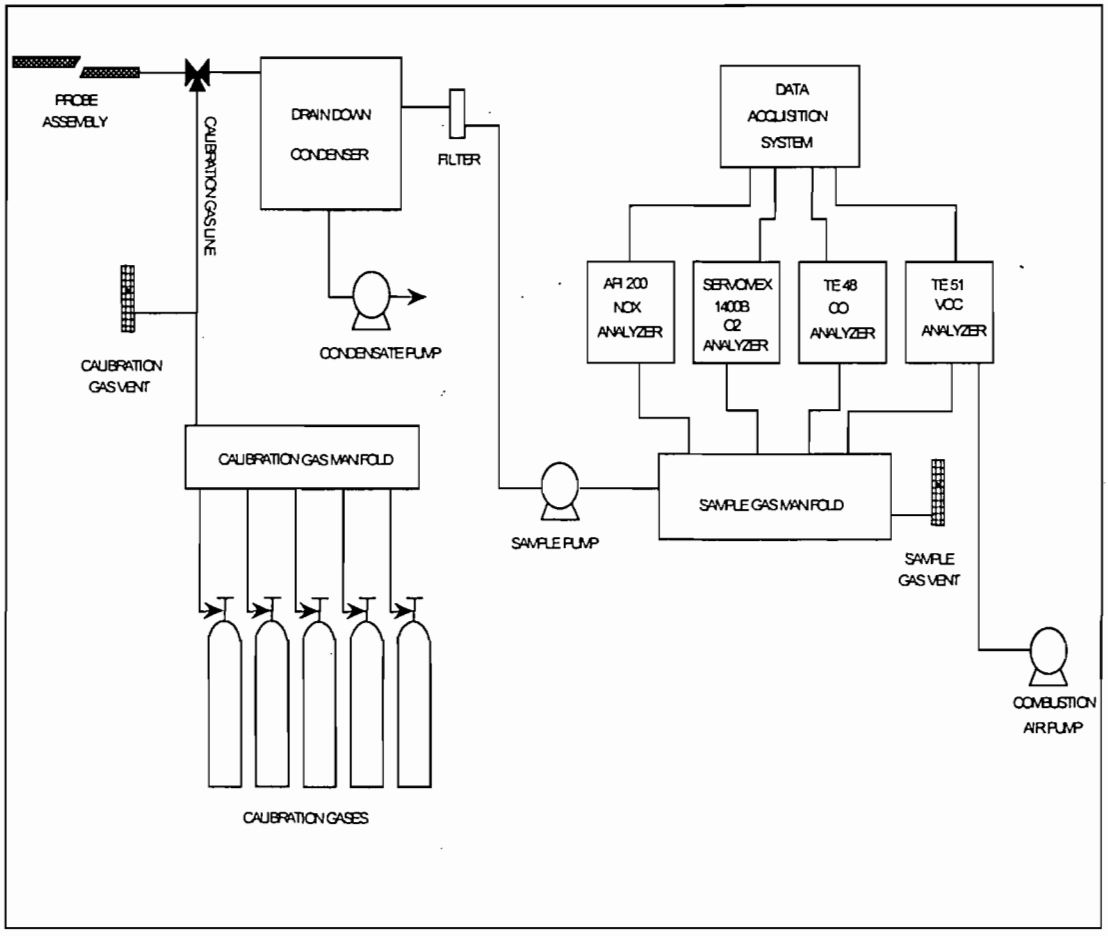


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**FIGURE 1**
Carbon Monoxide and Nitrogen Oxide Sampling Trains

USEPA METHODS 3A, 10, 20, 25 CEM SYSTEM LAYOUT

# 3.0 TEST RESULTS

## HOOKERS POINT CATERPILLAR GENERATING FIELD

## NITROGEN OXIDES TESTING

### XP2000 COMBUSTION ENGINE UNIT 26
### JULY 19, 2001

| RUN NO. | TIME | Exhaust Temperature Degrees F | ppm $NO_X$ Dry | ppm $NO_X$ Corrected to lbs/Hr |
|---|---|---|---|---|
| 1 | 11:40 –12:40 | 846.2 | 570 | 38.8 |
| 2 | 13:01 –14:01 | 852.6 | 506 | 34.3 |
| 3 | 14:18 –15:18 | 853.2 | 615 | 41.6 |
| | **Average** | 850.6 | 564 | 38.2 |

$NO_x$ corrected to lbs/Hr.
by
$NO_x$ Mass Flow Rate:

$$Flow\left[\frac{\mu g}{\min}\right] = \frac{GMW\left[\frac{g}{mol}\right] \times NO_x\ concentration\,[ppm] \times \frac{Vc\left[\frac{ft^3}{\min}\right]}{35.31\left[\frac{ft^3}{m^3}\right]} \times 1{,}000\left[\frac{L}{m^3}\right]}{22.414\left[\frac{L}{mol}\right] \times \frac{T_{ref}\,[K]}{273.15\,[K]}}$$

$$Flow\left[\frac{lb}{hr}\right] = Flow\left[\frac{\mu g}{\min}\right] \times \frac{1}{1{,}000{,}000}\left[\frac{g}{\mu g}\right] \times \frac{1}{454}\left[\frac{lb}{g}\right] \times \frac{60}{1}\left[\frac{\min}{hr}\right]$$

where:

GMW = gram molecular weight of NOx = 76 g/mol
$V_c$ = temperature corrected volumetric flow rate of flue gas
$T_{ref}$ = ambient temperature

## XP2000 COMBUSTION ENGINE UNIT 27
## JULY 16, 2001

| RUN NO. | TIME | Exhaust Temperature Degrees F | ppm $NO_X$ Dry | ppm $NO_X$ Corrected to lbs/Hr |
|---|---|---|---|---|
| 1 | 12:46 –13:46 | 820.4 | 504 | 35.0 |
| 2 | 14:06 –15:06 | 830.6 | 693 | 47.8 |
| 3 | 15:18 –16:18 | 833.0 | 507 | 34.9 |
| | **Average** | 828.0 | 568 | 39.2 |

$NO_x$ corrected to Ibs/Hr.
by
$NO_x$ Mass Flow Rate:

$$Flow\left[\frac{\mu g}{\min}\right] = \frac{GMW\left[\frac{g}{mol}\right] \times NO_x\ concentration\,[ppm] \times \frac{Vc\left[\frac{ft^3}{\min}\right]}{35.31\left[\frac{ft^3}{m^3}\right]} \times 1{,}000\left[\frac{L}{m^3}\right]}{22.414\left[\frac{L}{mol}\right] \times \frac{T_{ref}\,[K]}{273.15\,[K]}}$$

$$Flow\left[\frac{lb}{hr}\right] = Flow\left[\frac{\mu g}{\min}\right] \times \frac{1}{1{,}000{,}000}\left[\frac{g}{\mu g}\right] \times \frac{1}{454}\left[\frac{lb}{g}\right] \times \frac{60}{1}\left[\frac{\min}{hr}\right]$$

where:

GMW = gram molecular weight of NOx = 76 g/mol
$V_c$ = temperature corrected volumetric flow rate of flue gas
$T_{ref}$ = ambient temperature

## XP2000 COMBUSTION ENGINE UNIT 28
## JULY 18, 2001

| RUN NO. | TIME | Exhaust Temperature Degrees F | ppm $NO_X$ Dry | ppm $NO_X$ Corrected to lbs/Hr |
|---|---|---|---|---|
| 1 | 09:28 –10:28 | 846.7 | 589 | 40.3 |
| 2 | 10:46 –11:46 | 850.0 | 523 | 35.6 |
| 3 | 12:07 –13:07 | 854.6 | 508 | 34.4 |
| | **Average** | 850.4 | 540 | 36.8 |

$NO_x$ corrected to lbs/Hr.
by

$NO_x$ Mass Flow Rate:

$$Flow\left[\frac{\mu g}{\min}\right] = \frac{GMW\left[\frac{g}{mol}\right] \times NO_x\ concentration\,[ppm] \times \frac{Vc\left[\frac{ft^3}{\min}\right]}{35.31\left[\frac{ft^3}{m^3}\right]} \times 1{,}000\left[\frac{L}{m^3}\right]}{22.414\left[\frac{L}{mol}\right] \times \frac{T_{ref}\,[K]}{273.15\,[K]}}$$

$$Flow\left[\frac{lb}{hr}\right] = Flow\left[\frac{\mu g}{\min}\right] \times \frac{1}{1{,}000{,}000}\left[\frac{g}{\mu g}\right] \times \frac{1}{454}\left[\frac{lb}{g}\right] \times \frac{60}{1}\left[\frac{\min}{hr}\right]$$

where:

GMW = gram molecular weight of NOx = 76 g/mol
$V_c$ = temperature corrected volumetric flow rate of flue gas
$T_{ref}$ = ambient temperature

## XP2000 COMBUSTION ENGINE UNIT 29
## JULY 18, 2001

| RUN NO. | TIME | Exhaust Temperature Degrees F | ppm $NO_X$ Dry | ppm $NO_X$ Corrected to lbs/Hr |
|---|---|---|---|---|
| 1 | 14:15 –15:15 | 906.4 | 561 | 36.6 |
| 2 | 15:33 –16:33 | 907.1 | 561 | 36.5 |
| 3 | 16:51 –17:51 | 902.2 | 550 | 35.9 |
| | **Average** | 905.2 | 557 | 36.3 |

$NO_x$ corrected to Ibs/Hr.
by
$NO_x$ Mass Flow Rate:

$$Flow\left[\frac{\mu g}{\min}\right] = \frac{GMW\left[\frac{g}{mol}\right] \times NO_x\ concentration\,[ppm] \times \frac{Vc\left[\frac{ft^3}{\min}\right]}{35.31\left[\frac{ft^3}{m^3}\right]} \times 1{,}000\left[\frac{L}{m^3}\right]}{22.414\left[\frac{L}{mol}\right] \times \frac{T_{ref}\,[K]}{273.15\,[K]}}$$

$$Flow\left[\frac{lb}{hr}\right] = Flow\left[\frac{\mu g}{\min}\right] \times \frac{1}{1{,}000{,}000}\left[\frac{g}{\mu g}\right] \times \frac{1}{454}\left[\frac{lb}{g}\right] \times \frac{60}{1}\left[\frac{\min}{hr}\right]$$

where:

GMW = gram molecular weight of NOx = 76 g/mol
$V_c$ = temperature corrected volumetric flow rate of flue gas
$T_{ref}$ = ambient temperature

## XP2000 COMBUSTION ENGINE UNIT 30
## JULY 19, 2001

| RUN NO. | TIME | Exhaust Temperature Degrees F | ppm $NO_X$ Dry | ppm $NO_X$ Corrected to lbs/Hr |
|---|---|---|---|---|
| 1 | 06:50 –07:50 | 839.1 | 569 | 39.0 |
| 2 | 08:07 –09:07 | 849.4 | 531 | 36.1 |
| 3 | 09:27 –10:27 | 853.2 | 608 | 41.2 |
| | **Average** | 847.2 | 569 | 38.8 |

$NO_x$ corrected to lbs/Hr.
by
$NO_x$ Mass Flow Rate:

$$Flow\left[\frac{\mu g}{\min}\right] = \frac{GMW\left[\frac{g}{mol}\right] \times NO_x\ concentration\,[ppm] \times \frac{Vc\left[\frac{ft^3}{\min}\right]}{35.31\left[\frac{ft^3}{m^3}\right]} \times 1{,}000\left[\frac{L}{m^3}\right]}{22.414\left[\frac{L}{mol}\right] \times \frac{T_{ref}\,[K]}{273.15\,[K]}}$$

$$Flow\left[\frac{lb}{hr}\right] = Flow\left[\frac{\mu g}{\min}\right] \times \frac{1}{1{,}000{,}000}\left[\frac{g}{\mu g}\right] \times \frac{1}{454}\left[\frac{lb}{g}\right] \times \frac{60}{1}\left[\frac{\min}{hr}\right]$$

where:

GMW = gram molecular weight of NOx = 76 g/mol
$V_c$ = temperature corrected volumetric flow rate of flue gas
$T_{ref}$ = ambient temperature

Volumetric Flow Rate Temperature Correction

$$V_c = \frac{T_{ref} + 460°R}{T_s + 460°R} \times Q_{ref} \left[ \frac{ft^3}{\min} \right]$$

where:

$T_{ref}$ = ambient temperature
$T_s$ = stack temperature
$Q_{ref}$ = 14,267 = manufacturer's specification wet exhaust flow

# A. NITROGEN OXIDES CALCULATIONS

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 3.1 | 4.6 | 3.9 |
| 1268.0 ppm NOx | 1277.2 | 1276.9 | 1277.1 |
| 0.00 ppmNO | 3.10 | 3.10 | 3.1 |
| 1268.00 ppmNO | 1279.50 | 1277.90 | 1278.7 |

$\bar{C}$(NOx) = 576.6 $\bar{C}$(NO) = 563.9

CORRECTED RESULTS

570 ppm NOx
558 ppmNO
13 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

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CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 4.6 | 6.0 | 5.3 |
| 1268.0 ppm NOx | 1276.9 | 1275.7 | 1276.3 |
| 0.00 ppmNO | 3.10 | 3.10 | 3.1 |
| 1268.00 ppmNO | 1277.90 | 1276.30 | 1277.1 |

$\bar{C}$(NOx) = 512.5 $\bar{C}$(NO) = 502.5

CORRECTED RESULTS

506 ppm NOx
497 ppmNO
9 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 6.0 | 6.0 | 6.0 |
| 1268.0 ppm NOx | 1275.7 | 1272.6 | 1274.2 |
| 0.00 ppmNO | 3.10 | 4.60 | 3.9 |
| 1268.00 ppmNO | 1276.30 | 1273.30 | 1274.8 |

$\bar{C}$(NOx) = 621.0 $\bar{C}$(NO) = 607.2

CORRECTED RESULTS

615 ppm NOx
602 ppmNO
13 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

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1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | -9.8 | 6.9 | -1.5 |
| 1268.0 ppm NOx | 1240.1 | 1281.0 | 1260.6 |

$\bar{C}$(NOx) = 500.2

CORRECTED RESULTS

504 ppm NOx

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

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CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 6.9 | 5.8 | 6.4 |
| 1268.0 ppm NOx | 1281.0 | 1278.2 | 1279.6 |

$\bar{C}$(NOx) = 702.0

CORRECTED RESULTS

693 ppm NOx

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

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CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 5.8 | 1.7 | 3.8 |
| 1268.0 ppm NOx | 1278.2 | 1279.9 | 1279.1 |

$\bar{C}$(NOx) = 513.9

CORRECTED RESULTS

507 ppm NOx

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

# CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 1.5 | 3.0 | 2.3 |
| 1268.0 ppm NOx | 1280.1 | 1269.7 | 1274.9 |
| 1.50 ppmNO | 1.5 | 3.1 | 2.3 |
| 1268.00 ppmNO | 1279.3 | 1271.9 | 1275.6 |

$\bar{C}$(NOx) = 593.4 $\bar{C}$(NO) = 582.9

CORRECTED RESULTS

589 ppm NOx
579 ppmNO
10 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 3.0 | -1.9 | 0.6 |
| 1268.0 ppm NOx | 1269.7 | 1266.8 | 1268.3 |
| 1.50 ppmNO | 3.1 | 0.0 | 1.6 |
| 1268.00 ppmNO | 1271.9 | 1267.6 | 1269.8 |

$\bar{C}$(NOx) = 523.5 $\bar{C}$(NO) = 515.9

CORRECTED RESULTS

523 ppm NOx
515 ppmNO
8 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

# CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | -1.9 | -0.2 | -1.1 |
| 1268.0 ppm NOx | 1266.8 | 1262.5 | 1264.7 |
| 1.50 ppmNO | 0.0 | 1.5 | 0.8 |
| 1268.00 ppmNO | 1267.6 | 1264.6 | 1266.1 |

$\bar{C}$(NOx) = 506.4 $\bar{C}$(NO) = 499.2

CORRECTED RESULTS

508 ppm NOx
500 ppmNO
8 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 6.0 | 3.1 | 4.6 |
| 1268.0 ppm NOx | 1275.8 | 1277.1 | 1276.5 |
| 0.00 ppmNO | 4.6 | 3.1 | 3.9 |
| 1268.00 ppmNO | 1276.4 | 1279.4 | 1277.9 |

$\bar{C}$(NOx) = 567.0 $\bar{C}$(NO) = 557.3

CORRECTED RESULTS

561 ppm NOx
551 ppmNO
10 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 3.1 | 4.6 | 3.9 |
| 1268.0 ppm NOx | 1277.1 | 1272.7 | 1274.9 |
| 0.00 ppmNO | 3.1 | 3.1 | 3.1 |
| 1268.00 ppmNO | 1279.4 | 1270.5 | 1275.0 |

$\bar{C}$(NOx) = 565.8 $\bar{C}$(NO) = 556.2

CORRECTED RESULTS

561 ppm NOx
551 ppmNO
10 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

# CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 4.6 | 4.4 | 4.5 |
| 1268.0 ppm NOx | 1272.7 | 1269.7 | 1271.2 |
| 0.00 ppmNO | 3.1 | 3.1 | 3.1 |
| 1268.00 ppmNO | 1270.5 | 1271.9 | 1271.2 |

$\bar{C}$(NOx) = 554.4 $\bar{C}$(NO) = 544.9

CORRECTED RESULTS

550 ppm NOx
542 ppmNO
8 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: HOOKERS POINTCAT POWER UNIT 30

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 4.6 | 4.5 | 4.6 |
| 1268.0 ppm NOx | 1275.7 | 1275.6 | 1275.7 |
| 0.00 ppmNO | 2.9 | 3.0 | 3.0 |
| 1268.00 ppmNO | 1276.4 | 1274.4 | 1275.4 |

$\bar{C}$(NOx) = 575.1 $\bar{C}$(NO) = 562.9

CORRECTED RESULTS

569 ppm NOx
558 ppmNO
11 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: HOOKERS POINT CAT POWER UNIT 30

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 4.5 | 4.6 | 4.6 |
| 1268.0 ppm NOx | 1275.6 | 1274.2 | 1274.9 |
| 0.00 ppmNO | 3.0 | 3.1 | 3.1 |
| 1268.00 ppmNO | 1274.4 | 1273.5 | 1274.0 |

$\bar{C}$(NOx) = 536.6 $\bar{C}$(NO) = 525.9

CORRECTED RESULTS

531 ppm NOx
522 ppmNO
9 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: HOOKERS POINT CAT POWER UNIT 30

TEST DATE: 7/19/01

| GAS VALUE | INITIAL CAL | FINAL CAL | MEAN CAL |
|---|---|---|---|
| 0.0 ppm NOx | 4.6 | 3.1 | 3.9 |
| 1268.0 ppm NOx | 1274.2 | 1271.2 | 1272.7 |
| 0.00 ppmNO | 3.1 | 2.8 | 3.0 |
| 1268.00 ppmNO | 1273.5 | 1267.6 | 1270.6 |

$\bar{C}$(NOx) = 612.1 $\bar{C}$(NO) = 599.0

CORRECTED RESULTS

608 ppm NOx
596 ppmNO
12 ppm NO2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - $\bar{C}$m) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

1420
1.194E-07

## B. UNCORRECTED REFERENCE METHOD DATA

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 11:40 | 649.8 | 633.5 |
| 11:41 | 644.0 | 630.8 |
| 11:42 | 641.7 | 628.0 |
| 11:43 | 641.5 | 626.0 |
| 11:44 | 636.3 | 619.9 |
| 11:45 | 630.3 | 615.6 |
| 11:46 | 628.7 | 612.2 |
| 11:47 | 621.3 | 606.3 |
| 11:48 | 614.7 | 599.9 |
| 11:49 | 614.7 | 601.7 |
| 11:50 | 617.3 | 603.8 |
| 11:51 | 615.7 | 600.7 |
| 11:52 | 611.2 | 596.2 |
| 11:53 | 607.8 | 593.1 |
| 11:54 | 603.1 | 590.9 |
| 11:55 | 599.1 | 585.2 |
| 11:56 | 596.9 | 583.7 |
| 11:57 | 597.2 | 583.6 |
| 11:58 | 593.1 | 579.0 |
| 11:59 | 588.6 | 576.0 |
| 12:00 | 590.4 | 575.7 |
| 12:01 | 584.8 | 570.7 |
| 12:02 | 582.3 | 570.0 |
| 12:03 | 582.6 | 568.3 |
| 12:04 | 579.4 | 565.2 |
| 12:05 | 574.3 | 561.3 |
| 12:06 | 567.2 | 555.1 |
| 12:07 | 565.9 | 553.5 |
| 12:08 | 567.0 | 553.8 |
| 12:09 | 565.7 | 552.6 |
| 12:10 | 563.2 | 551.7 |
| 12:11 | 560.9 | 548.4 |
| 12:12 | 558.6 | 545.7 |
| 12:13 | 557.3 | 544.0 |
| 12:14 | 556.7 | 543.0 |
| 12:15 | 556.3 | 542.9 |
| 12:16 | 553.8 | 541.8 |
| 12:17 | 552.4 | 540.1 |
| 12:18 | 550.6 | 540.4 |
| 12:19 | 553.8 | 543.4 |
| 12:20 | 551.4 | 539.1 |
| 12:21 | 549.0 | 537.5 |
| 12:22 | 553.4 | 545.9 |
| 12:23 | 546.3 | 541.5 |
| 12:24 | 548.9 | 536.7 |
| 12:25 | 545.4 | 532.9 |
| 12:26 | 545.4 | 534.7 |
| 12:27 | 546.2 | 534.7 |
| 12:28 | 544.0 | 533.4 |
| 12:29 | 544.9 | 533.3 |
| 12:30 | 546.0 | 534.8 |
| 12:31 | 548.2 | 535.7 |
| 12:32 | 546.5 | 533.9 |
| 12:33 | 543.8 | 533.4 |
| 12:34 | 544.9 | 534.6 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 12:35 | 544.9 | 533.3 |
| 12:36 | 542.8 | 530.8 |
| 12:37 | 541.6 | 530.7 |
| 12:38 | 541.8 | 531.8 |
| 12:39 | 541.9 | 530.9 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 12:39 | 576.6 | 563.9 |
| DNB ~~12:40~~ | ~~540.0~~ | ~~529.0~~ |

COMMENTS: END RUN ONE
UNIT 26

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 13:02 | 523.6 | 512.7 |
| 13:03 | 523.1 | 511.1 |
| 13:04 | 521.4 | 510.8 |
| 13:05 | 520.0 | 509.7 |
| 13:06 | 518.7 | 509.2 |
| 13:07 | 519.4 | 508.9 |
| 13:08 | 516.6 | 507.3 |
| 13:09 | 516.9 | 508.1 |
| 13:10 | 516.5 | 505.6 |
| 13:11 | 516.6 | 507.4 |
| 13:12 | 518.0 | 508.8 |
| 13:13 | 520.1 | 510.6 |
| 13:14 | 518.9 | 507.7 |
| 13:15 | 515.8 | 505.4 |
| 13:16 | 515.4 | 507.5 |
| 13:17 | 515.6 | 505.1 |
| 13:18 | 512.7 | 503.4 |
| 13:19 | 514.6 | 504.6 |
| 13:20 | 512.2 | 502.0 |
| 13:21 | 511.8 | 502.2 |
| 13:22 | 509.8 | 499.2 |
| 13:23 | 507.9 | 498.6 |
| 13:24 | 509.6 | 500.4 |
| 13:25 | 512.0 | 502.3 |
| 13:26 | 511.3 | 500.1 |
| 13:27 | 511.8 | 501.3 |
| 13:28 | 512.4 | 502.6 |
| 13:29 | 513.9 | 505.5 |
| 13:30 | 515.4 | 506.9 |
| 13:31 | 516.3 | 506.8 |
| 13:32 | 517.4 | 506.9 |
| 13:33 | 516.9 | 505.4 |
| 13:34 | 512.8 | 502.3 |
| 13:35 | 513.9 | 505.1 |
| 13:36 | 515.7 | 505.9 |
| 13:37 | 515.6 | 504.6 |
| 13:38 | 510.8 | 499.3 |
| 13:39 | 505.9 | 494.9 |
| 13:40 | 506.5 | 498.7 |
| 13:41 | 510.2 | 500.1 |
| 13:42 | 509.3 | 498.5 |
| 13:43 | 506.9 | 497.5 |
| 13:44 | 508.1 | 497.4 |
| 13:45 | 507.3 | 497.7 |
| 13:46 | 506.8 | 497.4 |
| 13:47 | 506.6 | 496.7 |
| 13:48 | 508.6 | 499.4 |
| 13:49 | 509.7 | 499.7 |
| 13:50 | 506.7 | 497.6 |
| 13:51 | 506.5 | 497.4 |
| 13:52 | 507.8 | 498.2 |
| 13:53 | 509.1 | 499.5 |
| 13:54 | 508.1 | 498.5 |
| 13:55 | 506.9 | 496.0 |
| 13:56 | 507.1 | 497.2 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 13:57 | 509.1 | 497.8 |
| 13:58 | 509.2 | 498.0 |
| 13:59 | 507.2 | 496.9 |
| 14:00 | 506.7 | 496.5 |
| 14:01 | 507.8 | 498.6 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 14:01 | 512.5 | 502.5 |

COMMENTS: END RUN 2
UNIT 26

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 14:19 | 649.0 | 632.9 |
| 14:20 | 639.3 | 624.8 |
| 14:21 | 639.6 | 623.4 |
| 14:22 | 637.3 | 622.8 |
| 14:23 | 639.9 | 626.3 |
| 14:24 | 637.6 | 623.4 |
| 14:25 | 633.1 | 618.7 |
| 14:26 | 633.3 | 618.2 |
| 14:27 | 630.6 | 615.8 |
| 14:28 | 627.6 | 612.7 |
| 14:29 | 623.8 | 610.6 |
| 14:30 | 623.0 | 609.0 |
| 14:31 | 619.7 | 607.9 |
| 14:32 | 622.1 | 608.9 |
| 14:33 | 625.6 | 613.2 |
| 14:34 | 632.6 | 620.4 |
| 14:35 | 636.5 | 621.4 |
| 14:36 | 632.3 | 618.6 |
| 14:37 | 630.7 | 615.9 |
| 14:38 | 628.4 | 615.0 |
| 14:39 | 630.7 | 616.1 |
| 14:40 | 628.7 | 614.9 |
| 14:41 | 628.1 | 614.1 |
| 14:42 | 625.1 | 613.1 |
| 14:43 | 625.9 | 612.6 |
| 14:44 | 625.7 | 612.0 |
| 14:45 | 625.9 | 610.8 |
| 14:46 | 624.8 | 611.1 |
| 14:47 | 623.2 | 609.9 |
| 14:48 | 621.1 | 608.5 |
| 14:49 | 622.2 | 607.8 |
| 14:50 | 621.9 | 607.0 |
| 14:51 | 619.0 | 604.9 |
| 14:52 | 618.2 | 604.3 |
| 14:53 | 619.6 | 605.3 |
| 14:54 | 617.5 | 603.4 |
| 14:55 | 617.0 | 603.1 |
| 14:56 | 614.7 | 599.7 |
| 14:57 | 612.5 | 599.1 |
| 14:58 | 609.7 | 597.2 |
| 14:59 | 613.3 | 600.0 |
| 15:00 | 612.8 | 599.9 |
| 15:01 | 611.6 | 597.7 |
| 15:02 | 608.6 | 594.8 |
| 15:03 | 610.2 | 597.6 |
| 15:04 | 609.2 | 595.5 |
| 15:05 | 606.7 | 594.6 |
| 15:06 | 610.1 | 596.7 |
| 15:07 | 611.8 | 597.7 |
| 15:08 | 609.8 | 595.6 |
| 15:09 | 606.9 | 593.4 |
| 15:10 | 607.5 | 593.5 |
| 15:11 | 607.9 | 594.7 |
| 15:12 | 607.6 | 596.0 |
| 15:13 | 608.6 | 595.5 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 15:14 | 609.1 | 594.9 |
| 15:15 | 606.7 | 595.1 |
| 15:16 | 608.5 | 594.1 |
| 15:17 | 609.6 | 595.4 |
| 15:18 | 610.0 | 596.3 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 15:18 | 621.0 | 607.2 |

COMMENTS: END RUN 3
UNIT 26

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 12:47 | 503.6 |
| 12:48 | 500.5 |
| 12:49 | 492.3 |
| 12:50 | 499.7 |
| 12:51 | 495.5 |
| 12:52 | 489.4 |
| 12:53 | 487.2 |
| 12:54 | 481.8 |
| 12:55 | 476.0 |
| 12:56 | 478.4 |
| 12:57 | 483.7 |
| 12:58 | 481.9 |
| 12:59 | 480.5 |
| 13:00 | 477.1 |
| 13:01 | 477.8 |
| 13:02 | 480.9 |
| 13:03 | 487.1 |
| 13:04 | 484.0 |
| 13:05 | 483.4 |
| 13:06 | 483.4 |
| 13:07 | 481.5 |
| 13:08 | 488.0 |
| 13:09 | 486.5 |
| 13:10 | 489.3 |
| 13:11 | 489.8 |
| 13:12 | 488.9 |
| 13:13 | 482.2 |
| 13:14 | 485.2 |
| 13:15 | 486.5 |
| 13:16 | 486.9 |
| 13:17 | 484.2 |
| 13:18 | 482.3 |
| 13:19 | 486.5 |
| 13:20 | 487.5 |
| 13:21 | 484.9 |
| 13:22 | 483.3 |
| 13:23 | 484.2 |
| 13:24 | 487.4 |
| 13:25 | 488.4 |
| 13:26 | 515.6 |
| 13:27 | 546.2 |
| 13:28 | 542.7 |
| 13:29 | 544.0 |
| 13:30 | 539.5 |
| 13:31 | 534.8 |
| 13:32 | 536.9 |
| 13:33 | 529.9 |
| 13:34 | 522.2 |
| 13:35 | 518.4 |
| 13:36 | 524.2 |
| 13:37 | 524.5 |
| 13:38 | 520.8 |
| 13:39 | 519.0 |
| 13:40 | 512.7 |
| 13:41 | 523.7 |

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 14:07 | 710.6 |
| 14:08 | 716.9 |
| 14:09 | 713.4 |
| 14:10 | 710.2 |
| 14:11 | 715.0 |
| 14:12 | 708.5 |
| 14:13 | 708.7 |
| 14:14 | 711.6 |
| 14:15 | 712.6 |
| 14:16 | 713.5 |
| 14:17 | 707.9 |
| 14:18 | 709.6 |
| 14:19 | 708.3 |
| 14:20 | 707.6 |
| 14:21 | 719.5 |
| 14:22 | 716.2 |
| 14:23 | 710.2 |
| 14:24 | 706.2 |
| 14:25 | 703.3 |
| 14:26 | 703.9 |
| 14:27 | 702.5 |
| 14:28 | 697.7 |
| 14:29 | 697.9 |
| 14:30 | 692.8 |
| 14:31 | 687.1 |
| 14:32 | 694.3 |
| 14:33 | 686.3 |
| 14:34 | 716.7 |
| 14:35 | 709.0 |
| 14:36 | 712.1 |
| 14:37 | 707.2 |
| 14:38 | 710.8 |
| 14:39 | 706.3 |
| 14:40 | 710.1 |
| 14:41 | 716.0 |
| 14:42 | 703.3 |
| 14:43 | 705.1 |
| 14:44 | 709.9 |
| 14:45 | 713.0 |
| 14:46 | 719.2 |
| 14:47 | 702.2 |
| 14:48 | 702.0 |
| 14:49 | 694.7 |
| 14:50 | 695.2 |
| 14:51 | 690.3 |
| 14:52 | 703.1 |
| 14:53 | 694.2 |
| 14:54 | 690.8 |
| 14:55 | 703.2 |
| 14:56 | 697.3 |
| 14:57 | 696.0 |
| 14:58 | 689.1 |
| 14:59 | 684.0 |
| 15:00 | 687.5 |
| 15:01 | 678.0 |

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 15:02 | 680.5 |
| 15:03 | 681.8 |
| 15:04 | 682.8 |
| 15:05 | 680.2 |
| 15:06 | 676.9 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | |
|---|---|
| 15:06 | 702.0 |

COMMENTS: END RUN TWO
CAT UNIT 27

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 15:19 | 513.8 |
| 15:20 | 527.5 |
| 15:21 | 515.8 |
| 15:22 | 506.3 |
| 15:23 | 508.2 |
| 15:24 | 512.9 |
| 15:25 | 518.1 |
| 15:26 | 509.6 |
| 15:27 | 502.5 |
| 15:28 | 514.6 |
| 15:29 | 510.4 |
| 15:30 | 499.2 |
| 15:31 | 504.3 |
| 15:32 | 509.3 |
| 15:33 | 514.3 |
| 15:34 | 514.6 |
| 15:35 | 519.4 |
| 15:36 | 522.1 |
| 15:37 | 510.1 |
| 15:38 | 502.5 |
| 15:39 | 492.5 |
| 15:40 | 505.9 |
| 15:41 | 511.6 |
| 15:42 | 512.3 |
| 15:43 | 513.7 |
| 15:44 | 514.3 |
| 15:45 | 494.7 |
| 15:46 | 520.1 |
| 15:47 | 511.5 |
| 15:48 | 518.1 |
| 15:49 | 517.1 |
| 15:50 | 506.7 |
| 15:51 | 510.0 |
| 15:52 | 530.1 |
| 15:53 | 525.1 |
| 15:54 | 519.8 |
| 15:55 | 525.8 |
| 15:56 | 522.8 |
| 15:57 | 525.1 |
| 15:58 | 525.4 |
| 15:59 | 518.3 |
| 16:00 | 507.9 |
| 16:01 | 515.0 |
| 16:02 | 525.9 |
| 16:03 | 514.4 |
| 16:04 | 517.4 |
| 16:05 | 514.1 |
| 16:06 | 509.7 |
| 16:07 | 507.8 |
| 16:08 | 528.8 |
| 16:09 | 508.3 |
| 16:10 | 503.5 |
| 16:11 | 515.1 |
| 16:12 | 512.3 |
| 16:13 | 511.7 |

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 16:14 | 521.4 |
| 16:15 | 515.9 |
| 16:16 | 520.1 |
| 16:17 | 512.5 |
| 16:18 | 515.6 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | |
|---|---|
| 16:18 | 513.9 |

COMMENTS: END RUN THREE
CAT UNIT 27

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 09:29 | 675.4 | 661.1 |
| 09:30 | 668.7 | 656.4 |
| 09:31 | 682.4 | 672.1 |
| 09:32 | 676.6 | 659.3 |
| 09:33 | 663.1 | 648.2 |
| 09:34 | 653.1 | 640.7 |
| 09:35 | 650.8 | 639.0 |
| 09:36 | 646.5 | 634.5 |
| 09:37 | 643.9 | 632.6 |
| 09:38 | 639.0 | 626.4 |
| 09:39 | 633.9 | 621.3 |
| 09:40 | 627.9 | 616.7 |
| 09:41 | 624.0 | 611.7 |
| 09:42 | 620.0 | 608.9 |
| 09:43 | 615.6 | 605.4 |
| 09:44 | 614.2 | 602.8 |
| 09:45 | 611.3 | 600.4 |
| 09:46 | 610.9 | 601.4 |
| 09:47 | 608.1 | 597.2 |
| 09:48 | 605.7 | 594.2 |
| 09:49 | 603.5 | 594.0 |
| 09:50 | 602.6 | 591.9 |
| 09:51 | 600.1 | 589.0 |
| 09:52 | 595.4 | 585.7 |
| 09:53 | 592.4 | 582.1 |
| 09:54 | 587.7 | 577.6 |
| 09:55 | 587.0 | 576.4 |
| 09:56 | 586.2 | 575.8 |
| 09:57 | 581.1 | 571.5 |
| 09:58 | 579.0 | 568.7 |
| 09:59 | 576.5 | 566.2 |
| 10:00 | 576.3 | 565.5 |
| 10:01 | 575.6 | 565.2 |
| 10:02 | 572.6 | 562.3 |
| 10:03 | 571.6 | 560.3 |
| 10:04 | 567.4 | 557.4 |
| 10:05 | 569.1 | 559.5 |
| 10:06 | 567.2 | 557.5 |
| 10:07 | 565.8 | 558.6 |
| 10:08 | 566.8 | 557.3 |
| 10:09 | 564.1 | 554.1 |
| 10:10 | 561.9 | 552.4 |
| 10:11 | 562.6 | 553.1 |
| 10:12 | 565.3 | 555.9 |
| 10:13 | 571.2 | 560.9 |
| 10:14 | 570.3 | 559.7 |
| 10:15 | 566.0 | 556.5 |
| 10:16 | 562.4 | 554.1 |
| 10:17 | 562.9 | 554.4 |
| 10:18 | 562.5 | 553.1 |
| 10:19 | 559.6 | 551.0 |
| 10:20 | 557.7 | 548.2 |
| 10:21 | 555.0 | 548.3 |
| 10:22 | 558.5 | 551.5 |
| 10:23 | 557.7 | 547.8 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 10:24 | 554.8 | 546.1 |
| 10:25 | 555.0 | 547.3 |
| 10:26 | 552.3 | 542.5 |
| 10:27 | 553.3 | 544.3 |
| 10:28 | 553.5 | 542.6 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 10:28 | 593.4 | 582.9 |

COMMENTS: END RUN ONE
CAT UNIT 28

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 10:46 | 542.9 | 534.8 |
| 10:47 | 541.1 | 532.2 |
| 10:48 | 543.0 | 534.0 |
| 10:49 | 540.0 | 532.3 |
| 10:50 | 540.5 | 531.8 |
| 10:51 | 538.6 | 531.5 |
| 10:52 | 536.7 | 529.7 |
| 10:53 | 535.6 | 527.4 |
| 10:54 | 535.9 | 528.1 |
| 10:55 | 532.3 | 524.1 |
| 10:56 | 527.1 | 518.9 |
| 10:57 | 528.3 | 520.3 |
| 10:58 | 528.4 | 521.2 |
| 10:59 | 528.0 | 519.8 |
| 11:00 | 528.0 | 518.8 |
| 11:01 | 524.9 | 516.3 |
| 11:02 | 522.9 | 514.9 |
| 11:03 | 523.8 | 515.0 |
| 11:04 | 526.9 | 518.3 |
| 11:05 | 526.1 | 517.9 |
| 11:06 | 525.3 | 517.4 |
| 11:07 | 524.0 | 516.3 |
| 11:08 | 520.2 | 512.7 |
| 11:09 | 518.8 | 512.2 |
| 11:10 | 522.7 | 516.1 |
| 11:11 | 523.3 | 516.9 |
| 11:12 | 518.8 | 512.8 |
| 11:13 | 518.4 | 512.4 |
| 11:14 | 518.0 | 512.5 |
| 11:15 | 520.7 | 512.8 |
| 11:16 | 521.2 | 515.4 |
| 11:17 | 522.6 | 515.8 |
| 11:18 | 522.0 | 514.4 |
| 11:19 | 519.9 | 513.1 |
| 11:20 | 521.0 | 513.8 |
| 11:21 | 520.8 | 513.6 |
| 11:22 | 519.1 | 510.4 |
| 11:23 | 519.5 | 511.0 |
| 11:24 | 520.8 | 512.7 |
| 11:25 | 522.9 | 514.6 |
| 11:26 | 521.0 | 512.7 |
| 11:27 | 518.5 | 510.9 |
| 11:28 | 515.8 | 507.9 |
| 11:29 | 516.4 | 509.5 |
| 11:30 | 516.4 | 510.4 |
| 11:31 | 514.2 | 506.9 |
| 11:32 | 515.1 | 507.2 |
| 11:33 | 513.9 | 507.8 |
| 11:34 | 516.6 | 509.3 |
| 11:35 | 517.3 | 509.6 |
| 11:36 | 518.9 | 511.1 |
| 11:37 | 517.8 | 510.7 |
| 11:38 | 520.4 | 513.1 |
| 11:39 | 517.2 | 509.7 |
| 11:40 | 516.1 | 508.5 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 11:41 | 515.0 | 507.1 |
| 11:42 | 515.3 | 507.9 |
| 11:43 | 516.7 | 509.2 |
| 11:44 | 515.8 | 509.9 |
| 11:45 | 520.0 | 512.3 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 11:45 | 523.5 | 515.9 |

COMMENTS: END RUN TWO
CAT UNIT 28

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 12:07 | 539.6 | 530.2 |
| 12:08 | 539.0 | 530.3 |
| 12:09 | 536.2 | 528.0 |
| 12:10 | 532.3 | 524.3 |
| 12:11 | 526.8 | 518.8 |
| 12:12 | 525.0 | 517.7 |
| 12:13 | 522.7 | 514.5 |
| 12:14 | 520.8 | 512.4 |
| 12:15 | 519.9 | 511.6 |
| 12:16 | 517.7 | 509.1 |
| 12:17 | 515.8 | 508.3 |
| 12:18 | 514.1 | 506.8 |
| 12:19 | 516.3 | 509.7 |
| 12:20 | 517.8 | 510.9 |
| 12:21 | 516.9 | 509.1 |
| 12:22 | 518.3 | 512.7 |
| 12:23 | 525.3 | 517.9 |
| 12:24 | 523.0 | 513.7 |
| 12:25 | 516.1 | 508.5 |
| 12:26 | 513.9 | 508.0 |
| 12:27 | 519.4 | 512.7 |
| 12:28 | 519.4 | 511.2 |
| 12:29 | 515.5 | 507.0 |
| 12:30 | 517.0 | 509.8 |
| 12:31 | 516.2 | 508.8 |
| 12:32 | 513.6 | 507.5 |
| 12:33 | 514.2 | 507.6 |
| 12:34 | 514.4 | 506.2 |
| 12:35 | 512.8 | 504.1 |
| 12:36 | 512.2 | 504.9 |
| 12:37 | 509.3 | 501.8 |
| 12:38 | 506.3 | 498.5 |
| 12:39 | 504.5 | 497.9 |
| 12:40 | 504.6 | 498.1 |
| 12:41 | 504.8 | 497.6 |
| 12:42 | 505.3 | 497.9 |
| 12:43 | 503.5 | 496.1 |
| 12:44 | 505.0 | 498.2 |
| 12:45 | 503.8 | 498.5 |
| 12:46 | 505.7 | 498.7 |
| 12:47 | 506.8 | 498.6 |
| 12:48 | 504.7 | 497.5 |
| 12:49 | 504.4 | 496.7 |
| 12:50 | 502.7 | 495.2 |
| 12:51 | 502.1 | 492.3 |
| 12:52 | 489.1 | 480.1 |
| 12:53 | 482.6 | 476.3 |
| 12:54 | 479.7 | 473.5 |
| 12:55 | 478.2 | 472.0 |
| 12:56 | 478.7 | 472.0 |
| 12:57 | 478.7 | 472.7 |
| 12:58 | 479.2 | 473.1 |
| 12:59 | 479.9 | 476.2 |
| 13:00 | 480.5 | 474.4 |
| 13:01 | 480.1 | 473.4 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 13:02 | 479.8 | 473.7 |
| 13:03 | 478.7 | 472.0 |
| 13:04 | 477.8 | 471.5 |
| 13:05 | 478.3 | 471.6 |
| 13:06 | 478.5 | 472.1 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 13:06 | 506.4 | 499.2 |

COMMENTS: END RUN THREE
CAT UNIT 28

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 14:16 | 563.2 | 552.2 |
| 14:17 | 559.3 | 547.9 |
| 14:18 | 556.6 | 548.1 |
| 14:19 | 558.5 | 548.8 |
| 14:20 | 558.0 | 548.4 |
| 14:21 | 558.4 | 549.1 |
| 14:22 | 562.3 | 552.6 |
| 14:23 | 562.1 | 553.7 |
| 14:24 | 566.7 | 557.8 |
| 14:25 | 567.8 | 559.3 |
| 14:26 | 567.3 | 556.4 |
| 14:27 | 565.1 | 556.3 |
| 14:28 | 566.7 | 557.2 |
| 14:29 | 566.0 | 555.6 |
| 14:30 | 563.5 | 553.9 |
| 14:31 | 565.9 | 557.0 |
| 14:32 | 573.1 | 564.1 |
| 14:33 | 574.4 | 562.7 |
| 14:34 | 573.0 | 564.5 |
| 14:35 | 577.4 | 569.1 |
| 14:36 | 577.3 | 567.4 |
| 14:37 | 573.7 | 565.8 |
| 14:38 | 576.0 | 567.4 |
| 14:39 | 575.7 | 566.2 |
| 14:40 | 576.3 | 566.1 |
| 14:41 | 573.5 | 563.2 |
| 14:42 | 573.6 | 564.3 |
| 14:43 | 575.5 | 564.8 |
| 14:44 | 573.7 | 561.5 |
| 14:45 | 569.7 | 558.5 |
| 14:46 | 567.7 | 557.9 |
| 14:47 | 566.6 | 555.6 |
| 14:48 | 566.4 | 556.2 |
| 14:49 | 573.8 | 564.3 |
| 14:50 | 572.8 | 562.6 |
| 14:51 | 570.3 | 560.0 |
| 14:52 | 569.6 | 559.9 |
| 14:53 | 570.4 | 559.9 |
| 14:54 | 568.8 | 558.5 |
| 14:55 | 568.1 | 557.2 |
| 14:56 | 566.1 | 555.3 |
| 14:57 | 565.9 | 555.8 |
| 14:58 | 566.4 | 556.7 |
| 14:59 | 565.0 | 554.8 |
| 15:00 | 561.8 | 551.8 |
| 15:01 | 561.3 | 552.2 |
| 15:02 | 559.5 | 549.7 |
| 15:03 | 563.2 | 554.0 |
| 15:04 | 564.8 | 554.1 |
| 15:05 | 563.8 | 553.8 |
| 15:06 | 558.7 | 549.0 |
| 15:07 | 561.9 | 554.3 |
| 15:08 | 567.7 | 558.7 |
| 15:09 | 561.6 | 551.5 |
| 15:10 | 565.3 | 556.6 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 15:11 | 564.6 | 554.2 |
| 15:12 | 565.4 | 556.9 |
| 15:13 | 566.0 | 557.5 |
| 15:14 | 564.1 | 556.2 |
| 15:15 | 564.5 | 555.6 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 15:15 | 567.0 | 557.3 |

COMMENTS: END RUN ONE
CAT UNIT 29

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 15:34 | 587.7 | 577.3 |
| 15:35 | 587.6 | 575.9 |
| 15:36 | 583.4 | 573.4 |
| 15:37 | 581.9 | 572.6 |
| 15:38 | 582.7 | 570.6 |
| 15:39 | 576.9 | 566.5 |
| 15:40 | 577.2 | 566.2 |
| 15:41 | 580.4 | 569.4 |
| 15:42 | 574.3 | 564.9 |
| 15:43 | 571.9 | 562.3 |
| 15:44 | 572.2 | 561.8 |
| 15:45 | 568.4 | 558.5 |
| 15:46 | 569.7 | 561.1 |
| 15:47 | 574.3 | 565.1 |
| 15:48 | 572.7 | 563.7 |
| 15:49 | 572.5 | 560.7 |
| 15:50 | 566.9 | 556.9 |
| 15:51 | 564.2 | 554.6 |
| 15:52 | 563.6 | 553.6 |
| 15:53 | 563.8 | 553.6 |
| 15:54 | 560.7 | 552.4 |
| 15:55 | 563.0 | 554.5 |
| 15:56 | 564.7 | 554.2 |
| 15:57 | 563.0 | 552.7 |
| 15:58 | 562.3 | 551.8 |
| 15:59 | 558.9 | 549.7 |
| 16:00 | 558.6 | 550.1 |
| 16:01 | 557.5 | 549.9 |
| 16:02 | 560.3 | 551.0 |
| 16:03 | 559.5 | 549.5 |
| 16:04 | 558.2 | 548.6 |
| 16:05 | 558.8 | 550.2 |
| 16:06 | 559.3 | 550.1 |
| 16:07 | 559.8 | 551.5 |
| 16:08 | 561.5 | 553.4 |
| 16:09 | 560.1 | 550.1 |
| 16:10 | 561.2 | 553.4 |
| 16:11 | 563.5 | 553.1 |
| 16:12 | 562.3 | 552.2 |
| 16:13 | 563.4 | 553.0 |
| 16:14 | 561.3 | 552.5 |
| 16:15 | 563.5 | 551.4 |
| 16:16 | 559.2 | 549.1 |
| 16:17 | 561.6 | 552.4 |
| 16:18 | 561.4 | 551.9 |
| 16:19 | 560.0 | 551.2 |
| 16:20 | 561.8 | 552.2 |
| 16:21 | 561.1 | 551.5 |
| 16:22 | 556.8 | 548.4 |
| 16:23 | 559.5 | 552.0 |
| 16:24 | 560.6 | 551.6 |
| 16:25 | 561.1 | 551.0 |
| 16:26 | 560.6 | 549.7 |
| 16:27 | 558.7 | 550.3 |
| 16:28 | 565.5 | 556.6 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 16:29 | 565.1 | 556.5 |
| 16:30 | 565.7 | 557.7 |
| 16:31 | 566.8 | 558.7 |
| 16:32 | 561.8 | 553.5 |
| 16:33 | 564.2 | 554.4 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 16:33 | 565.8 | 556.2 |

COMMENTS: END RUN TWO
CAT UNIT 29

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 16:51 | 571.5 | 561.2 |
| 16:52 | 569.3 | 558.2 |
| 16:53 | 565.7 | 556.6 |
| 16:54 | 568.6 | 559.3 |
| 16:55 | 569.7 | 559.9 |
| 16:56 | 567.3 | 557.0 |
| 16:57 | 562.3 | 552.2 |
| 16:58 | 560.1 | 552.7 |
| 16:59 | 562.4 | 552.0 |
| 17:00 | 559.6 | 550.9 |
| 17:01 | 558.8 | 548.1 |
| 17:02 | 557.6 | 549.0 |
| 17:03 | 558.1 | 548.0 |
| 17:04 | 558.3 | 548.2 |
| 17:05 | 557.0 | 545.0 |
| 17:06 | 554.5 | 545.1 |
| 17:07 | 554.3 | 543.9 |
| 17:08 | 553.3 | 542.7 |
| 17:09 | 554.0 | 543.0 |
| 17:10 | 552.6 | 543.2 |
| 17:11 | 552.2 | 543.3 |
| 17:12 | 551.9 | 544.2 |
| 17:13 | 551.4 | 543.9 |
| 17:14 | 550.7 | 541.6 |
| 17:15 | 550.3 | 540.8 |
| 17:16 | 553.3 | 544.8 |
| 17:17 | 552.2 | 542.2 |
| 17:18 | 551.6 | 542.0 |
| 17:19 | 551.8 | 542.8 |
| 17:20 | 553.4 | 544.4 |
| 17:21 | 554.4 | 544.5 |
| 17:22 | 553.1 | 543.5 |
| 17:23 | 553.3 | 543.1 |
| 17:24 | 551.9 | 542.2 |
| 17:25 | 551.7 | 542.8 |
| 17:26 | 549.9 | 541.9 |
| 17:27 | 547.7 | 539.5 |
| 17:28 | 546.2 | 537.7 |
| 17:29 | 549.6 | 540.4 |
| 17:30 | 548.9 | 538.3 |
| 17:31 | 544.6 | 535.3 |
| 17:32 | 549.7 | 540.7 |
| 17:33 | 552.2 | 541.8 |
| 17:34 | 552.8 | 542.9 |
| 17:35 | 552.6 | 542.5 |
| 17:36 | 550.2 | 541.2 |
| 17:37 | 553.3 | 544.8 |
| 17:38 | 553.1 | 543.8 |
| 17:39 | 553.0 | 544.0 |
| 17:40 | 553.9 | 543.5 |
| 17:41 | 552.8 | 543.0 |
| 17:42 | 549.7 | 540.6 |
| 17:43 | 549.3 | 541.2 |
| 17:44 | 551.1 | 541.8 |
| 17:45 | 550.0 | 541.5 |

RING-HAVER POWER CAT TESTING 07-18-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 17:46 | 548.6 | 539.5 |
| 17:47 | 550.4 | 541.4 |
| 17:48 | 553.0 | 542.8 |
| 17:49 | 552.3 | 541.5 |
| 17:50 | 549.3 | 540.0 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 17:50 | 554.4 | 544.9 |

COMMENTS: END RUN THREE
CAT UNIT 29

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 06:51 | 638.5 | 624.2 |
| 06:52 | 634.5 | 618.5 |
| 06:53 | 629.6 | 614.2 |
| 06:54 | 625.6 | 610.9 |
| 06:55 | 622.6 | 608.3 |
| 06:56 | 619.6 | 606.2 |
| 06:57 | 617.5 | 603.2 |
| 06:58 | 614.6 | 600.4 |
| 06:59 | 612.7 | 598.2 |
| 07:00 | 608.9 | 595.1 |
| 07:01 | 605.6 | 592.3 |
| 07:02 | 601.7 | 589.8 |
| 07:03 | 597.6 | 584.8 |
| 07:04 | 597.6 | 583.5 |
| 07:05 | 596.2 | 582.6 |
| 07:06 | 591.2 | 577.9 |
| 07:07 | 586.6 | 573.3 |
| 07:08 | 583.7 | 570.9 |
| 07:09 | 580.6 | 569.1 |
| 07:10 | 578.5 | 566.6 |
| 07:11 | 577.8 | 565.6 |
| 07:12 | 576.7 | 565.3 |
| 07:13 | 576.2 | 564.0 |
| 07:14 | 573.8 | 563.2 |
| 07:15 | 571.9 | 560.2 |
| 07:16 | 570.7 | 559.4 |
| 07:17 | 569.4 | 557.4 |
| 07:18 | 566.8 | 555.6 |
| 07:19 | 566.8 | 556.7 |
| 07:20 | 566.4 | 555.0 |
| 07:21 | 564.0 | 552.7 |
| 07:22 | 563.4 | 552.5 |
| 07:23 | 565.2 | 552.5 |
| 07:24 | 565.4 | 552.3 |
| 07:25 | 563.9 | 552.6 |
| 07:26 | 564.1 | 551.2 |
| 07:27 | 562.0 | 549.4 |
| 07:28 | 560.3 | 549.0 |
| 07:29 | 559.4 | 547.2 |
| 07:30 | 558.5 | 546.4 |
| 07:31 | 557.8 | 545.8 |
| 07:32 | 557.9 | 546.0 |
| 07:33 | 556.1 | 545.0 |
| 07:34 | 556.8 | 546.1 |
| 07:35 | 555.6 | 545.6 |
| 07:36 | 554.6 | 543.3 |
| 07:37 | 553.1 | 542.8 |
| 07:38 | 551.6 | 541.0 |
| 07:39 | 551.2 | 539.1 |
| 07:40 | 549.1 | 537.2 |
| 07:41 | 548.0 | 535.9 |
| 07:42 | 547.3 | 536.1 |
| 07:43 | 546.0 | 535.9 |
| 07:44 | 546.1 | 536.3 |
| 07:45 | 545.7 | 535.2 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 07:46 | 546.7 | 535.6 |
| 07:47 | 549.2 | 538.3 |
| 07:48 | 549.2 | 538.4 |
| 07:49 | 548.6 | 536.9 |
| 07:50 | 548.1 | 535.9 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 07:50 | 575.1 | 562.9 |

COMMENTS: END RUN ONE
CAT UNIT 30

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 08:08 | 561.2 | 549.8 |
| 08:09 | 558.9 | 548.0 |
| 08:10 | 556.3 | 545.8 |
| 08:11 | 554.1 | 543.7 |
| 08:12 | 554.2 | 542.5 |
| 08:13 | 553.1 | 540.3 |
| 08:14 | 551.2 | 538.2 |
| 08:15 | 548.2 | 536.0 |
| 08:16 | 545.2 | 534.5 |
| 08:17 | 545.3 | 534.3 |
| 08:18 | 546.9 | 537.4 |
| 08:19 | 546.6 | 534.9 |
| 08:20 | 542.8 | 532.3 |
| 08:21 | 542.8 | 531.3 |
| 08:22 | 539.7 | 529.9 |
| 08:23 | 538.9 | 528.6 |
| 08:24 | 538.8 | 527.3 |
| 08:25 | 538.4 | 527.3 |
| 08:26 | 537.9 | 527.0 |
| 08:27 | 537.1 | 525.9 |
| 08:28 | 533.7 | 523.6 |
| 08:29 | 533.0 | 522.6 |
| 08:30 | 531.3 | 521.0 |
| 08:31 | 529.9 | 519.7 |
| 08:32 | 532.3 | 521.8 |
| 08:33 | 534.1 | 524.3 |
| 08:34 | 533.7 | 524.2 |
| 08:35 | 533.9 | 524.1 |
| 08:36 | 534.6 | 524.8 |
| 08:37 | 537.0 | 526.6 |
| 08:38 | 534.4 | 524.5 |
| 08:39 | 533.0 | 521.7 |
| 08:40 | 547.4 | 535.0 |
| 08:41 | 547.6 | 536.8 |
| 08:42 | 544.1 | 533.7 |
| 08:43 | 542.9 | 532.4 |
| 08:44 | 539.4 | 527.7 |
| 08:45 | 537.6 | 525.7 |
| 08:46 | 535.1 | 523.4 |
| 08:47 | 531.8 | 520.5 |
| 08:48 | 531.4 | 520.7 |
| 08:49 | 532.6 | 522.9 |
| 08:50 | 532.4 | 522.1 |
| 08:51 | 531.5 | 520.9 |
| 08:52 | 532.3 | 521.5 |
| 08:53 | 530.4 | 519.8 |
| 08:54 | 529.2 | 518.2 |
| 08:55 | 527.5 | 516.8 |
| 08:56 | 527.3 | 517.9 |
| 08:57 | 528.6 | 518.0 |
| 08:58 | 527.1 | 516.3 |
| 08:59 | 525.6 | 514.1 |
| 09:00 | 525.1 | 514.7 |
| 09:01 | 522.6 | 512.7 |
| 09:02 | 522.4 | 512.6 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 09:03 | 522.9 | 511.6 |
| 09:04 | 522.6 | 511.5 |
| 09:05 | 521.7 | 511.0 |
| 09:06 | 519.7 | 510.8 |
| 09:07 | 521.4 | 512.3 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 09:07 | 536.6 | 525.9 |

COMMENTS: END RUN TWO
CAT UNIT 30

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 09:28 | 643.0 | 627.9 |
| 09:29 | 642.0 | 627.3 |
| 09:30 | 639.4 | 624.7 |
| 09:31 | 633.5 | 619.0 |
| 09:32 | 637.6 | 626.2 |
| 09:33 | 640.2 | 624.7 |
| 09:34 | 632.9 | 617.1 |
| 09:35 | 630.6 | 615.6 |
| 09:36 | 625.1 | 610.7 |
| 09:37 | 621.0 | 605.9 |
| 09:38 | 616.2 | 603.1 |
| 09:39 | 615.3 | 603.7 |
| 09:40 | 619.0 | 606.5 |
| 09:41 | 621.9 | 609.0 |
| 09:42 | 620.1 | 606.1 |
| 09:43 | 616.0 | 601.6 |
| 09:44 | 612.5 | 598.8 |
| 09:45 | 609.3 | 596.2 |
| 09:46 | 606.1 | 594.1 |
| 09:47 | 607.9 | 596.1 |
| 09:48 | 615.1 | 602.4 |
| 09:49 | 618.5 | 606.7 |
| 09:50 | 620.9 | 606.8 |
| 09:51 | 615.6 | 600.8 |
| 09:52 | 609.6 | 596.3 |
| 09:53 | 612.1 | 600.3 |
| 09:54 | 613.9 | 600.0 |
| 09:55 | 611.5 | 598.9 |
| 09:56 | 611.6 | 600.2 |
| 09:57 | 614.9 | 601.6 |
| 09:58 | 612.8 | 599.2 |
| 09:59 | 612.3 | 599.3 |
| 10:00 | 611.2 | 597.3 |
| 10:01 | 609.6 | 596.8 |
| 10:02 | 610.2 | 597.1 |
| 10:03 | 607.0 | 594.6 |
| 10:04 | 607.8 | 596.6 |
| 10:05 | 612.6 | 599.8 |
| 10:06 | 612.8 | 599.1 |
| 10:07 | 610.3 | 597.1 |
| 10:08 | 608.8 | 596.9 |
| 10:09 | 610.9 | 598.1 |
| 10:10 | 606.8 | 593.1 |
| 10:11 | 601.9 | 589.4 |
| 10:12 | 600.6 | 589.3 |
| 10:13 | 601.5 | 588.2 |
| 10:14 | 600.0 | 586.9 |
| 10:15 | 601.0 | 589.5 |
| 10:16 | 600.9 | 589.0 |
| 10:17 | 600.5 | 587.5 |
| 10:18 | 598.8 | 585.0 |
| 10:19 | 600.1 | 587.3 |
| 10:20 | 601.1 | 586.2 |
| 10:21 | 598.0 | 585.1 |
| 10:22 | 600.0 | 587.7 |

RING-HAVER POWER CAT TESTING 07-19-2001

| TIME | CHAN 4 OUTLET ppmNOX | CHAN 5 OUTLET ppmNO |
|---|---|---|
| 10:23 | 601.2 | 588.9 |
| 10:24 | 600.5 | 586.2 |
| 10:25 | 588.3 | 574.9 |
| 10:26 | 582.2 | 570.5 |
| 10:27 | 584.6 | 572.6 |

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

| | | |
|---|---|---|
| 10:27 | 612.1 | 599.0 |

COMMENTS: END RUN THREE
CAT UNIT 30

## C. VISIBLE EMISSIONS DATA SHEETS

TAMPA ELECTRIC
A TECO ENERGY COMPANY

# VISIBLE EMISSION OBSERVATION

E-496 R 10/85

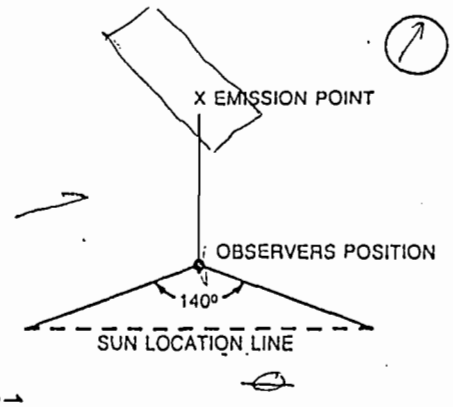
| SOURCE NAME | SOURCE LOCATION | OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|---|---|
| Hookers Point IC Engines | Tampa | 7/19/2001 | 11:23 | 11:53 |

TYPE OF FACILITY: Trailered Diesel Generator

DISTANCE FROM OBSERVER: ~70'

SKY CONDITIONS/PLUME BACKGROUND: Broken / tampa skyline as background (gray/green)

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW




AVERAGE OPACITY: 5.8%

WIND SPEED (EST.): light ~3-8 mph

WIND DIRECTION (EST.): ~SSW to S variable

OBSERVER'S NAME (PRINT): R.A. McDarby

OBSERVER'S SIGNATURE: R A McDarby

DATE: 7/19/2001

COMMENTS: Power Unit #26.

| SEC. MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | Ø | 5 | 5 | 31 | | | | |
| 2 | 5 | 5 | 5 | 5 | 32 | | | | |
| 3 | Ø | 5 | 5 | 5 | 33 | | | | |
| 4 | 5 | 5 | 5 | 5 | 34 | | | | |
| 5 | 10 | 10 | 5 | 10 | 35 | | | | |
| 6 | 10 | 10 | 10 | 5 | 36 | | | | |
| 7 | 5 | 5 | 5 | 5 | 37 | | | | |
| 8 | 5 | 5 | 5 | 5 | 38 | | | | |
| 9 | 5 | 5 | 5 | 5 | 39 | | | | |
| 10 | 5 | 5 | 5 | 5 | 40 | | | | |
| 11 | 5 | 5 | 10 | 5 | 41 | | | | |
| 12 | 10 | 5 | 5 | 5 | 42 | | | | |
| 13 | 5 | 5 | 5 | 10 | 43 | | | | |
| 14 | 5 | 5 | 10 | 5 | 44 | | | | |
| 15 | 5 | 5 | 5 | 5 | 45 | | | | |
| 16 | 5 | 10 | 10 | 5 | 46 | | | | |
| 17 | 5 | 5 | 5 | 5 | 47 | | | | |
| 18 | 10 | 5 | 5 | 5 | 48 | | | | |
| 19 | 5 | 10 | 10 | 5 | 49 | | | | |
| 20 | 5 | 5 | 5 | 5 | 50 | | | | |
| 21 | 5 | 5 | 5 | 5 | 51 | | | | |
| 22 | 5 | 5 | 5 | 5 | 52 | | | | |
| 23 | 10 | 5 | 5 | 5 | 53 | | | | |
| 24 | 10 | 10 | 5 | 5 | 54 | | | | |
| 25 | 5 | 5 | 5 | 5 | 55 | | | | |
| 26 | 5 | 10 | 5 | 5 | 56 | | | | |
| 27 | 5 | 5 | 5 | 5 | 57 | | | | |
| 28 | 10 | 5 | 5 | 5 | 58 | | | | |
| 29 | 5 | 5 | 5 | 5 | 59 | | | | |
| 30 | 10 | 5 | 5 | 5 | 60 | | | | |

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Certificate Officer

Bearer's Signature

TAMPA ELECTRIC
A TECO ENERGY COMPANY

# VISIBLE EMISSION OBSERVATION

E-496 R 10/85

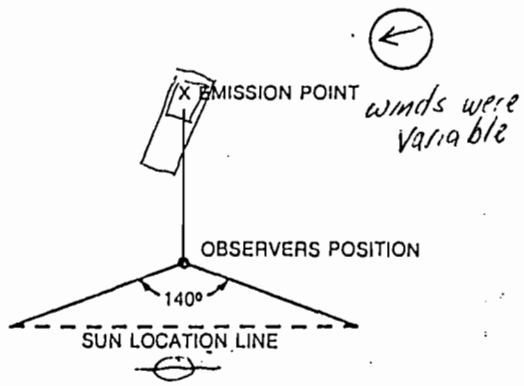
| SOURCE NAME | SOURCE LOCATION | OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|---|---|
| Hobbs Pt. IC Engine | Tampa | 7/16/2001 | 14:49 | 15:19 |

TYPE OF FACILITY: Trailered Diesel Generator

DISTANCE FROM OBSERVER: ~100'

SKY CONDITIONS/PLUME BACKGROUND: Overcast / green (trees)

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW




AVERAGE OPACITY: 6.2%

WIND SPEED (EST.): light ~3 to 8 mph

WIND DIRECTION (EST.): variable

OBSERVER'S NAME (PRINT): R.A. McDarby

OBSERVER'S SIGNATURE: R.A. McDarby

DATE: 7/16/2001

COMMENTS: Power Unit #27

Thunderstorms forming + moving to NNW

Exhaust temperatures ~800°F, some "swirling" of plume.

| SEC. MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 5 | 5 | 5 | 31 | | | | |
| 2 | 5 | 5 | 5 | 5 | 32 | | | | |
| 3 | 5 | 10 | 5 | 10 | 33 | | | | |
| 4 | 5 | 5 | 10 | 10 | 34 | | | | |
| 5 | 5 | 5 | 5 | 5 | 35 | | | | |
| 6 | 5 | 10 | 10 | 10 | 36 | | | | |
| 7 | 5 | 10 | 5 | 10 | 37 | | | | |
| 8 | 5 | 10 | 5 | 5 | 38 | | | | |
| 9 | 10 | 5 | 5 | 5 | 39 | | | | |
| 10 | 10 | 5 | 5 | 5 | 40 | | | | |
| 11 | 10 | 10 | 10 | 10 | 41 | | | | |
| 12 | 5 | 5 | 10 | 10 | 42 | | | | |
| 13 | 5 | 5 | 5 | 5 | 43 | | | | |
| 14 | 5 | 10 | 5 | 5 | 44 | | | | |
| 15 | 5 | 5 | 5 | 10 | 45 | | | | |
| 16 | 5 | 5 | 5 | 5 | 46 | | | | |
| 17 | 5 | 5 | 5 | 5 | 47 | | | | |
| 18 | 10 | 5 | 10 | 10 | 48 | | | | |
| 19 | 5 | 5 | 5 | 5 | 49 | | | | |
| 20 | 5 | 5 | 10 | 5 | 50 | | | | |
| 21 | 5 | 5 | 5 | 10 | 51 | | | | |
| 22 | 5 | 5 | 5 | 5 | 52 | | | | |
| 23 | 5 | 5 | 5 | 5 | 53 | | | | |
| 24 | 5 | 10 | 5 | 5 | 54 | | | | |
| 25 | 5 | 5 | 5 | 5 | 55 | | | | |
| 26 | 5 | 5 | 10 | 5 | 56 | | | | |
| 27 | 5 | 5 | 5 | 5 | 57 | | | | |
| 28 | 5 | 10 | 5 | 5 | 58 | | | | |
| 29 | 5 | 5 | 5 | 5 | 59 | | | | |
| 30 | 10 | 5 | 5 | 5 | 60 | | | | |

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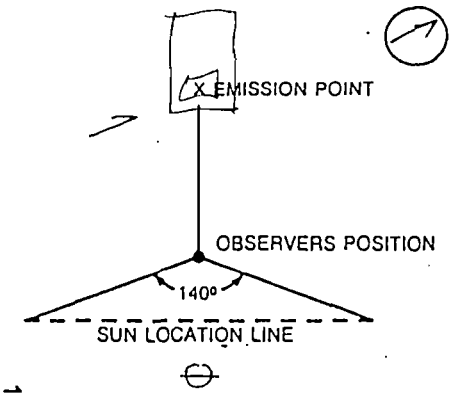
TAMPA ELECTRIC
A TECO ENERGY COMPANY

# VISIBLE EMISSION OBSERVATION

E-496 R 10/85

| | |
|---|---|
| SOURCE NAME | Hookers Point HC Engine |
| SOURCE LOCATION | Tampa |
| TYPE OF FACILITY | Trailed Diesel Generator |
| DISTANCE FROM OBSERVER | ~90' |
| SKY CONDITIONS/PLUME BACKGROUND | clear skies / background is Tampa skyline |

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW




| | |
|---|---|
| AVERAGE OPACITY | 4.9% |
| WIND SPEED (EST.) | light / variable ~3-8 mph |
| WIND DIRECTION (EST.) | ~S |
| OBSERVER'S NAME (PRINT) | R.A. McDarby |
| OBSERVER'S SIGNATURE | R.A. McDarby |
| DATE | 7/18/2001 |
| COMMENTS | Power Unit #28 |

| OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|
| 7/18/2001 | 10 15 | 10 45 |

| SEC. / MIN | 0 | 15 | 30 | 45 | SEC / MIN | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 5 | 5 | 5 | 31 | | | | |
| 2 | 5 | Ø | 5 | 5 | 32 | | | | |
| 3 | 5 | 5 | 5 | 5 | 33 | | | | |
| 4 | 5 | 5 | 5 | 10 | 34 | | | | |
| 5 | 5 | 5 | 5 | Ø | 35 | | | | |
| 6 | 5 | 5 | 5 | 5 | 36 | | | | |
| 7 | 5 | 5 | 5 | 5 | 37 | | | | |
| 8 | 5 | 5 | 5 | 5 | 38 | | | | |
| 9 | 5 | 10 | 5 | 5 | 39 | | | | |
| 10 | 5 | 5 | 5 | 5 | 40 | | | | |
| 11 | 5 | 5 | 5 | 5 | 41 | | | | |
| 12 | Ø | Ø | 5 | 5 | 42 | | | | |
| 13 | 5 | 5 | 5 | 5 | 43 | | | | |
| 14 | 5 | 5 | 5 | Ø | 44 | | | | |
| 15 | Ø | 5 | 5 | 5 | 45 | | | | |
| 16 | Ø | Ø | 5 | 10 | 46 | | | | |
| 17 | 5 | 5 | 5 | 5 | 47 | | | | |
| 18 | 5 | 5 | 5 | 5 | 48 | | | | |
| 19 | 5 | 5 | 5 | 5 | 49 | | | | |
| 20 | 10 | 5 | 5 | 5 | 50 | | | | |
| 21 | 5 | 5 | 5 | 5 | 51 | | | | |
| 22 | 10 | 5 | 5 | 5 | 52 | | | | |
| 23 | 5 | 5 | 5 | 5 | 53 | | | | |
| 24 | 5 | 5 | 10 | 5 | 54 | | | | |
| 25 | 5 | 5 | 5 | 5 | 55 | | | | |
| 26 | 5 | 5 | 5 | 5 | 56 | | | | |
| 27 | 5 | 5 | 5 | 5 | 57 | | | | |
| 28 | 5 | 5 | 5 | 5 | 58 | | | | |
| 29 | 5 | 5 | 5 | 5 | 59 | | | | |
| 30 | 5 | 5 | 5 | 5 | 60 | | | | |

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TAMPA ELECTRIC
A TECO ENERGY COMPANY

# VISIBLE EMISSION OBSERVATION

E-496 R 10/85

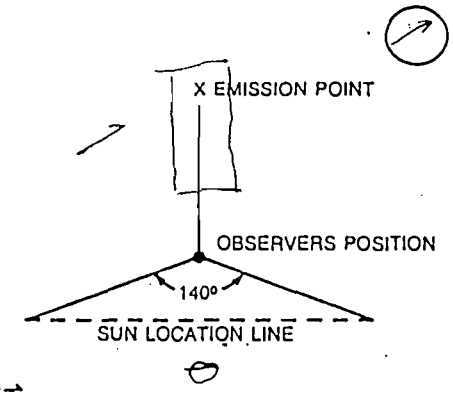
| SOURCE NAME | SOURCE LOCATION | OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|---|---|
| Hookers Point IC Engine | Tampa | 7/18/2001 | 1015 | 1045 |

TYPE OF FACILITY: Trailerd Diesel Generator

DISTANCE FROM OBSERVER: ~ 90'

SKY CONDITIONS/PLUME BACKGROUND: clear skies / background is Tampa skyline

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW




AVERAGE OPACITY: 5.7

WIND SPEED (EST.): light / variable ~3-8mph

WIND DIRECTION (EST.): ~S

OBSERVER'S NAME (PRINT): R.A. McDarby

OBSERVER'S SIGNATURE: R A McDarby

DATE: 7/18/2001

COMMENTS: Power unit #29

| SEC. MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | Ø | 5 | 5 | 31 | | | | |
| 2 | 5 | 5 | 5 | 5 | 32 | | | | |
| 3 | 5 | Ø | 5 | 5 | 33 | | | | |
| 4 | 10 | 5 | 5 | 5 | 34 | | | | |
| 5 | 5 | 5 | 5 | 5 | 35 | | | | |
| 6 | 5 | 10 | 5 | 5 | 36 | | | | |
| 7 | 5 | 10 | 5 | 10 | 37 | | | | |
| 8 | 5 | 5 | 10 | 5 | 38 | | | | |
| 9 | 10 | 10 | 5 | 10 | 39 | | | | |
| 10 | 5 | 10 | 5 | 5 | 40 | | | | |
| 11 | Ø | 5 | 5 | 5 | 41 | | | | |
| 12 | 5 | 5 | 5 | 5 | 42 | | | | |
| 13 | 5 | 10 | 5 | 10 | 43 | | | | |
| 14 | 5 | 5 | 5 | 5 | 44 | | | | |
| 15 | Ø | 5 | 5 | 5 | 45 | | | | |
| 16 | 5 | 5 | 5 | 10 | 46 | | | | |
| 17 | 5 | 5 | 5 | 5 | 47 | | | | |
| 18 | 5 | 10 | 5 | 5 | 48 | | | | |
| 19 | 5 | 5 | 10 | 5 | 49 | | | | |
| 20 | 5 | 5 | 5 | 5 | 50 | | | | |
| 21 | 5 | 5 | 5 | 5 | 51 | | | | |
| 22 | 10 | 10 | 5 | 10 | 52 | | | | |
| 23 | 5 | 5 | 5 | 5 | 53 | | | | |
| 24 | 5 | 5 | 5 | 5 | 54 | | | | |
| 25 | 5 | 5 | 5 | 5 | 55 | | | | |
| 26 | 5 | 5 | 10 | 5 | 56 | | | | |
| 27 | 5 | 5 | 5 | 5 | 57 | | | | |
| 28 | 5 | 5 | 5 | 5 | 58 | | | | |
| 29 | 5 | 5 | 5 | 5 | 59 | | | | |
| 30 | 5 | 10 | 5 | 10 | 60 | | | | |

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Certificate Officer — Bearer's Signature

TAMPA ELECTRIC
A TECO ENERGY COMPANY

# VISIBLE EMISSION OBSERVATION

E-496 R 10/85

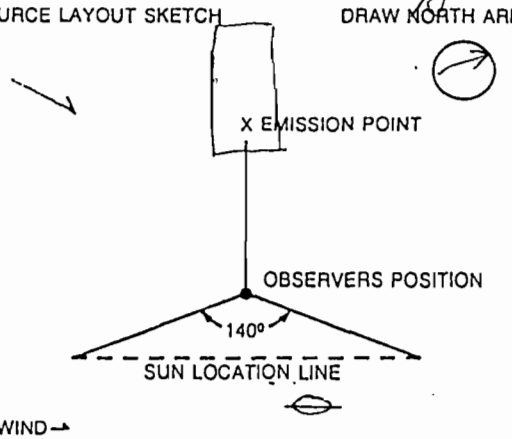
| SOURCE NAME | SOURCE LOCATION | OBSERVATION DATE | START TIME | STOP TIME |
|---|---|---|---|---|
| Hookers Point I.C. Engine | Tampa | 7/19/2001 | 10:29 | 10:59 |

TYPE OF FACILITY: Trailered Diesel Generator

DISTANCE FROM OBSERVER: ~70'

SKY CONDITIONS/PLUME BACKGROUND: broken / background is Hookers Point facility tan/green

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW




AVERAGE OPACITY: 5.3%

WIND SPEED (EST.): light ~3-8 mph

WIND DIRECTION (EST.): ~S to SSW variable

OBSERVER'S NAME (PRINT): R.A. McDarby

OBSERVER'S SIGNATURE: RAMcDarby

DATE: 7/19/2001

COMMENTS: Power Unit #30

| SEC. MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 5 | 5 | 5 | 31 | | | | |
| 2 | 5 | 5 | 5 | 5 | 32 | | | | |
| 3 | 5 | 5 | 5 | 5 | 33 | | | | |
| 4 | 5 | 5 | 5 | 5 | 34 | | | | |
| 5 | 5 | 5 | 5 | 5 | 35 | | | | |
| 6 | 5 | 5 | 5 | 5 | 36 | | | | |
| 7 | 5 | 5 | 5 | 5 | 37 | | | | |
| 8 | 5 | 10 | 5 | 5 | 38 | | | | |
| 9 | 5 | 5 | 5 | 10 | 39 | | | | |
| 10 | 5 | 5 | 5 | 5 | 40 | | | | |
| 11 | 10 | 5 | 5 | 5 | 41 | | | | |
| 12 | 5 | 5 | 5 | 5 | 42 | | | | |
| 13 | 5 | 10 | 5 | 5 | 43 | | | | |
| 14 | 5 | 5 | 5 | 5 | 44 | | | | |
| 15 | 5 | 5 | 5 | 5 | 45 | | | | |
| 16 | 5 | 5 | 5 | 5 | 46 | | | | |
| 17 | 5 | 5 | 5 | 5 | 47 | | | | |
| 18 | 5 | 5 | 10 | 5 | 48 | | | | |
| 19 | 5 | 5 | 5 | 5 | 49 | | | | |
| 20 | 5 | 5 | 5 | 5 | 50 | | | | |
| 21 | 5 | 5 | 5 | 5 | 51 | | | | |
| 22 | 5 | 5 | 5 | 5 | 52 | | | | |
| 23 | 5 | 5 | 5 | 10 | 53 | | | | |
| 24 | 5 | 5 | 5 | 5 | 54 | | | | |
| 25 | 5 | 5 | 5 | 5 | 55 | | | | |
| 26 | 5 | 5 | 5 | 5 | 56 | | | | |
| 27 | 5 | 5 | 5 | 5 | 57 | | | | |
| 28 | 5 | 5 | 5 | 5 | 58 | | | | |
| 29 | 10 | 5 | 5 | 5 | 59 | | | | |
| 30 | 5 | 5 | 5 | 5 | 60 | | | | |

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## D. TCEMS CALIBRATION DATA

D.1 INITIAL/FINAL TCEMS CALIBRATIONS

D.2 SYSTEM BIAS TESTS

D.3 SYSTEM BIAS AND DRIFT CALCULATIONS

## D.1 INITIAL/FINAL TCEMS CALIBRATIONS

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL DAILY CAL UNIT 26

DATE : 07-19-2001 TIME: 11:04 - 11:37

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 3.1 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1277.2 |
| 4 | OUTLET | ppmNOX | 2224.0 | 2222.6 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1279.5 |
| 5 | OUTLET | ppmNO | 2224.0 | 2226.5 |

# CONTINUOUS EMISSIONS MONITORING SET-UP

SOURCE: RING-HAVER POWER CAT TESTING

DATE: 07-16-2001 TIME: 12:09

| A/D CHAN | DESCRIP | UNITS | SPAN | INPUT VOLTAGE | ZERO OFFSET |
|---|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 2500 | 10.00 V | 0% |

AVERAGING PERIODS: ONE HOUR,
NO EMISSION RATE CALCULATIONS

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL DAILY CAL UNIT 27

DATE : 07-16-2001 TIME: 10:14 - 10:19

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | 0.3 |
| 6 | OUTLET | ppmNOX | 44.7 | 42.8 |
| 6 | OUTLET | ppmNOX | 92.4 | 92.8 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL DAILY CAL

DATE : 07-16-2001 TIME: 12:10 - 12:24

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | 0.6 |
| 6 | OUTLET | ppmNOX | 1268.0 | 1239.8 |
| 6 | OUTLET | ppmNOX | 2224.0 | 2221.3 |

RING-HAVER POWER CAT TESTING 07-16-2001

| TIME | CHAN 6 OUTLET ppmNOX |
|---|---|
| 10:42 | 46.0 |
| 10:43 | 46.2 |
| 10:44 | 46.3 |
| 10:45 | 46.4 |
| 10:46 | 46.5 |
| 10:47 | 46.6 |
| 10:48 | 46.7 |
| 10:49 | 46.7 |
| 10:50 | 46.8 |
| 10:51 | 46.9 |
| 10:52 | 46.9 |
| 10:53 | 47.0 |
| 10:54 | 47.0 |
| 10:55 | 47.0 |
| 10:56 | 47.0 |
| 10:57 | 47.1 |
| 10:58 | 47.1 |
| 10:59 | 47.1 |
| 11:00 | 47.1 |
| 11:01 | 47.1 |
| 11:02 | 47.0 |
| 11:03 | 46.8 |
| 11:04 | 46.6 |
| 11:05 | 46.5 |
| 11:06 | 46.3 |
| 11:07 | 46.0 |
| 11:08 | 45.8 |
| 11:09 | 45.8 |
| 11:10 | 45.4 |
| 11:11 | 45.4 |

AVERAGE VALUES FOR THE LAST 30 MINUTES

11:11 46.6

COMMENTS: END CONVERTER EFFICIENCY TEST

# CONTINUOUS EMISSIONS MONITORING SET-UP

SOURCE: RING-HAVER POWER CAT TESTING

DATE: 07-18-2001 TIME: 08:48

| A/D CHAN | DESCRIP | UNITS | SPAN | INPUT VOLTAGE | ZERO OFFSET |
|---|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 2500 | 5.00 V | 0% |
| 5 | OUTLET | ppmNO | 2500 | 5.00 V | 0% |

AVERAGING PERIODS: ONE HOUR,
NO EMISSION RATE CALCULATIONS

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL DAILY CAL

DATE : 07-18-2001 TIME: 08:48 - 09:04

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 1.5 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1293.2 |
| 4 | OUTLET | ppmNOX | 2224.0 | 2234.2 |
| 5 | OUTLET | ppmNO | 0.0 | 1.5 |
| 5 | OUTLET | ppmNO | 1268.0 | 1286.6 |
| 5 | OUTLET | ppmNO | 2224.0 | 2230.9 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL CALIBRATION UNIT 29

DATE : 07-18-2001 TIME: 13:35 - 13:57

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 1.5 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1285.9 |
| 4 | OUTLET | ppmNOX | 2224.0 | 2222.9 |
| 5 | OUTLET | ppmNO | 0.0 | 1.5 |
| 5 | OUTLET | ppmNO | 1268.0 | 1285.2 |
| 5 | OUTLET | ppmNO | 2224.0 | 2226.5 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL DAILY CAL

DATE : 07-19-2001 TIME: 05:56 - 06:22

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 1.7 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1271.2 |
| 4 | OUTLET | ppmNOX | 2224.0 | 2229.8 |
| 5 | OUTLET | ppmNO | 0.0 | 1.7 |
| 5 | OUTLET | ppmNO | 1268.0 | 1271.8 |
| 5 | OUTLET | ppmNO | 2224.0 | 2224.8 |

## D.2 SYSTEM BIAS TESTS

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN ONE BIAS CAL UNIT 26

DATE : 07-19-2001 TIME: 12:44 - 12:51

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.6 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1276.9 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1277.9 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: BIAS CHECKS BETWEEN RUNS 2 AND 3

DATE : 07-19-2001 TIME: 14:02 - 14:08

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 6.0 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1275.7 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1276.3 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: BIAS CHECK END OF RUN 3

DATE : 07-19-2001 TIME: 15:18 - 15:26

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 6.0 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1272.6 |
| 5 | OUTLET | ppmNO | 0.0 | 4.6 |
| 5 | OUTLET | ppmNO | 1268.0 | 1273.3 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL BIAS CAL UNIT 27

DATE : 07-16-2001 TIME: 12:32 - 12:35

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | -9.8 |
| 6 | OUTLET | ppmNOX | 1268.0 | 1240.1 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN 2 BIAS CAL UNIT 27

DATE : 07-16-2001 TIME: 13:47 - 13:58

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | 6.9 |
| 6 | OUTLET | ppmNOX | 1268.0 | 1281.0 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN TWO BIAS CAL UNIT 27

DATE : 07-16-2001 TIME: 15:07 - 15:11

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | 5.8 |
| 6 | OUTLET | ppmNOX | 1268.0 | 1278.2 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN THREE BIAS UNIT 27

DATE : 07-16-2001 TIME: 16:18 - 16:20

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 6 | OUTLET | ppmNOX | 0.0 | 1.7 |
| 6 | OUTLET | ppmNOX | 1268.0 | 1279.9 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL BIAS CAL UNIT 28

DATE : 07-18-2001 TIME: 09:13 - 09:21

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 1.5 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1280.1 |
| 5 | OUTLET | ppmNO | 0.0 | 1.5 |
| 5 | OUTLET | ppmNO | 1268.0 | 1279.3 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN ONE BIAS CAL UNIT 28

DATE : 07-18-2001 TIME: 10:31 - 10:37

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 3.0 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1269.7 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1271.9 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN TWO BIAS CAL UNIT 28

DATE : 07-18-2001 TIME: 11:49 - 11:59

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | -1.9 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1266.8 |
| 5 | OUTLET | ppmNO | 0.0 | -0.0 |
| 5 | OUTLET | ppmNO | 1268.0 | 1267.6 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN THREE BIAS CAL UNIT 28

DATE : 07-18-2001 TIME: 13:09 - 13:16

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | -0.2 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1262.5 |
| 5 | OUTLET | ppmNO | 0.0 | 1.5 |
| 5 | OUTLET | ppmNO | 1268.0 | 1264.6 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL BIAS CAL UNIT 29

DATE : 07-18-2001 TIME: 13:59 - 14:07

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 6.0 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1275.8 |
| 5 | OUTLET | ppmNO | 0.0 | 4.6 |
| 5 | OUTLET | ppmNO | 1268.0 | 1276.4 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN ONE BIAS CAL UNIT 29

DATE : 07-18-2001 TIME: 15:18 - 15:27

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 3.1 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1277.1 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1279.4 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN TWO BIAS CAL UNIT 29

DATE : 07-18-2001 TIME: 16:34 - 16:41

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.6 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1272.7 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1270.5 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN THREE BIAS CAL UNIT 29

DATE : 07-18-2001 TIME: 17:52 - 17:58

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.4 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1269.7 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1271.9 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: INITIAL BIAS CAL UNIT 30

DATE : 07-19-2001 TIME: 06:32 - 06:40

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.6 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1275.7 |
| 5 | OUTLET | ppmNO | 0.0 | 2.9 |
| 5 | OUTLET | ppmNO | 1268.0 | 1276.4 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN ONE BIAS CAL UNIT 30

DATE : 07-19-2001 TIME: 07:51 - 07:56

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.5 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1275.6 |
| 5 | OUTLET | ppmNO | 0.0 | 3.0 |
| 5 | OUTLET | ppmNO | 1268.0 | 1274.4 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN TWO BIAS CAL UNIT 30

DATE : 07-19-2001 TIME: 09:13 - 09:21

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 4.6 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1274.2 |
| 5 | OUTLET | ppmNO | 0.0 | 3.1 |
| 5 | OUTLET | ppmNO | 1268.0 | 1273.5 |

# CALIBRATION SUMMARY

SOURCE: RING-HAVER POWER CAT TESTING

REASON: RUN THREE BIAS CAL UNIT 30

DATE : 07-19-2001 TIME: 10:28 - 10:36

| A/D CHAN | MONITOR DESCRIPTION | UNITS | GAS VALUE | MONITOR RESPONSE |
|---|---|---|---|---|
| 4 | OUTLET | ppmNOX | 0.0 | 3.1 |
| 4 | OUTLET | ppmNOX | 1268.0 | 1271.2 |
| 5 | OUTLET | ppmNO | 0.0 | 2.8 |
| 5 | OUTLET | ppmNO | 1268.0 | 1267.6 |

## D.3 SYSTEM BIAS AND DRIFT CALCULATIONS

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

RUN NUMBER: 1

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 3.1 | 3.1 | 0.00 | 4.6 | 0.06 | 0.06 |
| NOx UP-SCALE | 1277.2 | 1277.2 | 0.00 | 1276.9 | -0.01 | -0.01 |
| NO ZERO GAS | 3.10 | 3.10 | 0.00 | 3.10 | 0.00 | 0.00 |
| NO UP-SCALE | 1279.50 | 1279.50 | 0.00 | 1277.90 | -0.06 | -0.06 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

RUN NUMBER: 2

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 3.1 | 4.6 | 0.06 | 6.0 | 0.12 | 0.06 |
| NOx UP-SCALE | 1277.2 | 1276.9 | -0.01 | 1275.7 | -0.06 | -0.05 |
| NO ZERO GAS | 3.10 | 3.10 | 0.00 | 3.10 | 0.00 | 0.00 |
| NO UP-SCALE | 1279.50 | 1277.90 | -0.06 | 1276.30 | -0.13 | -0.06 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 26

TEST DATE: 7/19/01

RUN NUMBER: 3

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 3.1 | 6.0 | 0.12 | 6.0 | 0.12 | 0.00 |
| NOx UP-SCALE | 1277.2 | 1275.7 | -0.06 | 1272.6 | -0.18 | -0.12 |
| NO ZERO GAS | 3.10 | 3.10 | 0.00 | 4.60 | 0.06 | 0.06 |
| NO UP-SCALE | 1279.50 | 1276.30 | -0.13 | 1273.30 | -0.25 | -0.12 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

RUN NUMBER: 1

SPAN VALUES: 2500 ppm NOx

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | -9.8 | -9.8 | 0.00 | 6.9 | 0.67 | 0.67 |
| NOx UP-SCALE | 1240.1 | 1240.1 | 0.00 | 1281.0 | 1.64 | 1.64 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

RUN NUMBER: 2

SPAN VALUES: 2500 ppm NOx

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | -9.8 | 6.9 | 0.67 | 5.8 | 0.62 | -0.04 |
| NOx UP-SCALE | 1240.1 | 1281.0 | 1.64 | 1278.2 | 1.52 | -0.11 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: RING-HAVER CAT POWER, UNIT 27

TEST DATE: 7/16/01

RUN NUMBER: 3

SPAN VALUES: 2500 ppm NOx

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | -9.8 | 5.8 | 0.62 | 1.7 | 0.46 | -0.16 |
| NOx UP-SCALE | 1240.1 | 1278.2 | 1.52 | 1279.9 | 1.59 | 0.07 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

RUN NUMBER: 1

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 1.5 | 1.5 | 0.00 | 3.0 | 0.06 | 0.06 |
| NOx UP-SCALE | 1280.1 | 1280.1 | 0.00 | 1269.7 | -0.42 | -0.42 |
| NO ZERO GAS | 1.5 | 1.5 | 0.00 | 3.1 | 0.06 | 0.06 |
| NO UP-SCALE | 1279.3 | 1279.3 | 0.00 | 1271.9 | -0.30 | -0.30 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

RUN NUMBER: 2

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 1.5 | 3.0 | 0.06 | -1.9 | -0.14 | -0.20 |
| NOx UP-SCALE | 1280.1 | 1269.7 | -0.42 | 1266.8 | -0.53 | -0.12 |
| NO ZERO GAS | 1.50 | 3.10 | 0.06 | 0.00 | -0.06 | -0.12 |
| NO UP-SCALE | 1279.30 | 1271.90 | -0.30 | 1267.60 | -0.47 | -0.17 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: H.P RING-HAVER CAT POWER UNIT 28

TEST DATE: 7/18/01

RUN NUMBER: 3

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 1.5 | -1.9 | -0.14 | -0.2 | -0.07 | 0.07 |
| NOx UP-SCALE | 1280.1 | 1266.8 | -0.53 | 1262.5 | -0.70 | -0.17 |
| NO ZERO GAS | 1.50 | 0.0 | -0.06 | 1.5 | 0.00 | 0.06 |
| NO UP-SCALE | 1279.30 | 1267.6 | -0.47 | 1264.6 | -0.59 | -0.12 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

RUN NUMBER: 1

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 6.0 | 6.0 | 0.00 | 3.1 | -0.12 | -0.12 |
| NOx UP-SCALE | 1275.8 | 1275.8 | 0.00 | 1277.1 | 0.05 | 0.05 |
| NO ZERO GAS | 4.60 | 4.6 | 0.00 | 3.1 | -0.06 | -0.06 |
| NO UP-SCALE | 1276.40 | 1276.4 | 0.00 | 1279.4 | 0.12 | 0.12 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

RUN NUMBER: 2

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 6.0 | 3.1 | -0.12 | 4.6 | -0.06 | 0.06 |
| NOx UP-SCALE | 1275.8 | 1277.1 | 0.05 | 1272.7 | -0.12 | -0.18 |
| NO ZERO GAS | 4.60 | 3.1 | -0.06 | 3.1 | -0.06 | 0.00 |
| NO UP-SCALE | 1276.40 | 1279.4 | 0.12 | 1270.5 | -0.24 | -0.36 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOOKERS POINT POWER CAT UNIT 29 TEST

TEST DATE: 7/18/01

RUN NUMBER: 3

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 6.0 | 4.6 | -0.06 | 4.4 | -0.06 | -0.01 |
| NOx UP-SCALE | 1275.8 | 1272.7 | -0.12 | 1269.7 | -0.24 | -0.12 |
| NO ZERO GAS | 4.60 | 3.1 | -0.06 | 3.1 | -0.06 | 0.00 |
| NO UP-SCALE | 1276.40 | 1270.5 | -0.24 | 1271.9 | -0.18 | 0.06 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOKERS POINT RING-HAVER UNIT 30

TEST DATE: 7/19/01

RUN NUMBER: 1

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 4.6 | 4.6 | 0.00 | 4.5 | -0.00 | -0.00 |
| NOx UP-SCALE | 1275.7 | 1275.7 | 0.00 | 1275.6 | -0.00 | -0.00 |
| NO ZERO GAS | 2.9 | 2.9 | 0.00 | 3.0 | 0.00 | 0.00 |
| NO UP-SCALE | 1276.4 | 1276.4 | 0.00 | 1274.4 | -0.08 | -0.08 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOKERS POINT RING-HAVER UNIT 30

TEST DATE: 7/19/01

RUN NUMBER: 2

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 4.6 | 4.5 | -0.00 | 4.6 | 0.00 | 0.00 |
| NOx UP-SCALE | 1275.7 | 1275.6 | -0.00 | 1274.2 | -0.06 | -0.06 |
| NO ZERO GAS | 2.9 | 3.0 | 0.00 | 3.1 | 0.01 | 0.00 |
| NO UP-SCALE | 1276.4 | 1274.4 | -0.08 | 1273.5 | -0.12 | -0.04 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: HOKERS POINT RING-HAVER UNIT 30

TEST DATE: 7/19/01

RUN NUMBER: 3

SPAN VALUES: 2500 ppm NOx
2500 ppmNO

| | | ------INITIAL VALUES------ | | ------FINAL VALUES------ | | |
|---|---|---|---|---|---|---|
| | ANALYZER CAL. RESPONSE | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | SYSTEM CAL. RESPONSE | SYSTEM CAL. BIAS (% OF SPAN) | DRIFT (% OF SPAN) |
| NOx ZERO GAS | 4.6 | 4.6 | 0.00 | 3.1 | -0.06 | -0.06 |
| NOx UP-SCALE | 1275.7 | 1274.2 | -0.06 | 1271.2 | -0.18 | -0.12 |
| NO ZERO GAS | 2.9 | 3.1 | 0.01 | 2.8 | -0.00 | -0.01 |
| NO UP-SCALE | 1276.4 | 1273.5 | -0.12 | 1267.6 | -0.35 | -0.24 |

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

# E. CALIBRATION GAS CERTIFICATES OF ANALYSIS

EA Phil 1

RATA CLASS

# Scott Specialty Gases

*Dual-Analyzed Calibration Standard*

6141 EASTON ROAD, BLDG 1,PLUMSTEADVILLE,PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

## CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
6141 EASTON ROAD, BLDG 1
PLUMSTEADVILLE,PA 18949-0310

P.O. No.: E-N75516
Project No.: 01-51597-001

**Customer**

TAMPA ELECTRIC

5010 CAUSEWAY BLVD
TAMPA FL 33619

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

**Cylinder Number:** ALM005388 **Certification Date:** 3/26/01 **Exp. Date:** 3/26/2003
**Cylinder Pressure***:** 1982 PSIA

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| NITRIC OXIDE | 1,265 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN - OXYGEN FREE | | BALANCE | | |
| TOTAL OXIDES OF NITROGEN | 1,268. | PPM | | Reference Value Only |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1687 | 3/01/03 | ALM018805 | 1000. PPM | NO/N2 |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR System/8220/AAB9300174 | 03/05/01 | Scott Enhanced FTIR |

### ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

NITRIC OXIDE

**First Triad Analysis**

| Date:03/19/01 | Response Unit:PPM | |
|---|---|---|
| Z1 = -0.22040 | R1 = 1000.334 | T1 = 1267.950 |
| R2 = 1002.529 | Z2 = -0.00910 | T2 = 1270.028 |
| Z3 = -0.14000 | T3 = 1262.812 | R3 = 997.1362 |
| Avg. Concentration: | 1267. | PPM |

**Second Triad Analysis**

| Date: 03/26/01 | Response Unit: PPM | |
|---|---|---|
| Z1 = -0.00390 | R1 = 1000.372 | T1 = 1261.864 |
| R2 = 999.2310 | Z2 = 0.33130 | T2 = 1264.124 |
| Z3 = 0.20130 | T3 = 1263.092 | R3 = 1000.396 |
| Avg. Concentration: | 1263. | PPM |

**Calibration Curve**

| | |
|---|---|
| Concentration = A + Bx + Cx2 + Dx3 + Ex4 | |
| r = 0.999990 | |
| Constants: | A = 0.000000 |
| B = 1.000000 | C = 0.000000 |
| D = 0.000000 | E = 0.000000 |

APPROVED BY: Michael A. Kuhns

CES Phil 2

# RATA CLASS

## Scott Specialty Gases

*Dual-Analyzed Calibration Standard*

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

## CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM, NC 27704

P.O. No.: N31923
Project No.: 12-35384-003

**Customer**

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

**Cylinder Number:** ALM039857 **Certification Date:** 8/03/99 **Exp. Date:** 8/02/2001

48T **Cylinder Pressure***:** 1956 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| NITRIC OXIDE | 2,219 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN - OXYGEN FREE | | BALANCE | | |
| TOTAL OXIDES OF NITROGEN | 2,224. | PPM | | Reference Value Only |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM2631 | 3/01/03 | ALM061390 | 2780. PPM | NO/N2 |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR System/8220/AAB9400252 | 07/22/99 | Scott Enhanced FTIR |

### ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

NITRIC OXIDE

**First Triad Analysis**

| Date:07/27/99 | Response Unit:PPM | |
|---|---|---|
| Z1 = 0.12400 | R1 = 2778.250 | T1 = 2221.730 |
| R2 = 2781.907 | Z2 = 0.38800 | T2 = 2218.676 |
| Z3 = 0.13240 | T3 = 2220.326 | R3 = 2782.917 |
| Avg. Concentration: | 2220. | PPM |

**Second Triad Analysis**

| Date: 08/03/99 | Response Unit: PPM | |
|---|---|---|
| Z1 = 0.20240 | R1 = 2778.364 | T1 = 2215.877 |
| R2 = 2781.395 | Z2 = 0.62730 | T2 = 2221.257 |
| Z3 = 0.48200 | T3 = 2218.886 | R3 = 2780.239 |
| Avg. Concentration: | 2219. | PPM |

**Calibration Curve**

| Concentration = A + Bx + Cx2 + Dx3 + Ex4 | |
|---|---|
| r = 0.999990 | |
| Constants: | A = 0.000000 |
| B = 1.000000 | C = 0.000000 |
| D = 0.000000 | E = 0.000000 |

Recd 8-9-99

APPROVED BY: B.M. Becton

# F. FIELD DATA SHEETS

TECO
TAMPA ELECTRIC

# TEMPERATURE MEASUREMENTS
# FIELD DATA SHEET

Date 7/19/01

Facility Hookers Ring-Haver Unit No. 26 Location Outlet

Load (mw) 1.825 Pyrometer I. D. 28-02800 Operator D. Smith

RUN 1

| TIME | Temp. deg$^F$ |
|---|---|
| 11:40 | 846.0 |
| 11:54 | 847.5 |
| 12:17 | 846.9 |
| 12:39 | 844.6 |
| Avg. | 846.2 |

RUN 2

| TIME | Temp. deg$^F$ |
|---|---|
| 13:04 | 851.1 |
| 13:17 | 853.9 |
| 13:31 | 852.9 |
| 13:52 | 852.5 |
| Average: | 852.6 |

RUN 3

| TIME | Temp. deg$^F$ |
|---|---|
| 14:19 | 849.5 |
| 14:38 | 853.4 |
| 14:56 | 854.6 |
| 15:12 | 855.2 |
| Average: | 853.2 |

Unit 26

Molecular Weight of Emissions 76

| | Time | Ambient Temperature [F] | Stack Temperature [F] | Corrected Flue Gas Volumetric Flow Rate [$ft^3$/min] | NOx [ppm] | Nox [lb/hr] |
|---|---|---|---|---|---|---|
| RUN 1 | 11:40 | 90 | 846 | 6008.3 | 649.8 | 44.3 |
| | 11:41 | 90 | 846 | 6008.3 | 644 | 43.9 |
| | 11:42 | 90 | 846 | 6008.3 | 641.7 | 43.7 |
| | 11:43 | 90 | 846 | 6008.3 | 641.5 | 43.7 |
| | 11:44 | 90 | 846 | 6008.3 | 636.3 | 43.4 |
| | 11:45 | 90 | 846 | 6008.3 | 630.3 | 43.0 |
| | 11:46 | 90 | 846 | 6008.3 | 628.7 | 42.9 |
| | 11:47 | 90 | 846 | 6008.3 | 621.3 | 42.4 |
| | 11:48 | 90 | 846 | 6008.3 | 614.7 | 41.9 |
| | 11:49 | 90 | 846 | 6008.3 | 614.7 | 41.9 |
| | 11:50 | 90 | 846 | 6008.3 | 617.3 | 42.1 |
| | 11:51 | 90 | 846 | 6008.3 | 615.7 | 42.0 |
| | 11:52 | 90 | 846 | 6008.3 | 611.2 | 41.7 |
| | 11:53 | 90 | 846 | 6008.3 | 607.8 | 41.4 |
| | 11:54 | 90 | 847.5 | 6001.4 | 603.1 | 41.1 |
| | 11:55 | 90 | 847.5 | 6001.4 | 599.1 | 40.8 |
| | 11:56 | 90 | 847.5 | 6001.4 | 596.9 | 40.6 |
| | 11:57 | 90 | 847.5 | 6001.4 | 597.2 | 40.7 |
| | 11:58 | 90 | 847.5 | 6001.4 | 593.1 | 40.4 |
| | 11:59 | 90 | 847.5 | 6001.4 | 588.6 | 40.1 |
| | 12:00 | 90 | 847.5 | 6001.4 | 590.4 | 40.2 |
| | 12:01 | 90 | 847.5 | 6001.4 | 584.8 | 39.8 |
| | 12:02 | 90 | 847.5 | 6001.4 | 582.3 | 39.6 |
| | 12:03 | 90 | 847.5 | 6001.4 | 582.6 | 39.7 |
| | 12:04 | 90 | 847.5 | 6001.4 | 579.4 | 39.5 |
| | 12:05 | 90 | 847.5 | 6001.4 | 574.3 | 39.1 |
| | 12:06 | 90 | 847.5 | 6001.4 | 567.2 | 38.6 |
| | 12:07 | 90 | 847.5 | 6001.4 | 565.9 | 38.5 |
| | 12:08 | 90 | 847.5 | 6001.4 | 567 | 38.6 |
| | 12:09 | 90 | 847.5 | 6001.4 | 565.7 | 38.5 |
| | 12:10 | 90 | 847.5 | 6001.4 | 563.2 | 38.3 |
| | 12:11 | 90 | 847.5 | 6001.4 | 560.9 | 38.2 |
| | 12:12 | 90 | 847.5 | 6001.4 | 558.6 | 38.0 |
| | 12:13 | 90 | 847.5 | 6001.4 | 557.3 | 37.9 |
| | 12:14 | 90 | 847.5 | 6001.4 | 556.7 | 37.9 |
| | 12:15 | 90 | 847.5 | 6001.4 | 556.3 | 37.9 |
| | 12:16 | 90 | 847.5 | 6001.4 | 553.8 | 37.7 |
| | 12:17 | 90 | 846.9 | 6004.2 | 552.4 | 37.6 |
| | 12:18 | 90 | 846.9 | 6004.2 | 550.6 | 37.5 |
| | 12:19 | 90 | 846.9 | 6004.2 | 553.8 | 37.7 |
| | 12:20 | 90 | 846.9 | 6004.2 | 551.4 | 37.6 |
| | 12:21 | 90 | 846.9 | 6004.2 | 549 | 37.4 |
| | 12:22 | 90 | 846.9 | 6004.2 | 553.4 | 37.7 |
| | 12:23 | 90 | 846.9 | 6004.2 | 546.3 | 37.2 |
| | 12:24 | 90 | 846.9 | 6004.2 | 548.9 | 37.4 |

Unit 26

| | | | | | |
|---|---|---|---|---|---|
| 12:25 | 90 | 846.9 | 6004.2 | 545.4 | 37.2 |
| 12:26 | 90 | 846.9 | 6004.2 | 545.4 | 37.2 |
| 12:27 | 90 | 846.9 | 6004.2 | 546.2 | 37.2 |
| 12:28 | 90 | 846.9 | 6004.2 | 544 | 37.1 |
| 12:29 | 90 | 846.9 | 6004.2 | 544.9 | 37.1 |
| 12:30 | 90 | 846.9 | 6004.2 | 546 | 37.2 |
| 12:31 | 90 | 846.9 | 6004.2 | 548.2 | 37.3 |
| 12:32 | 90 | 846.9 | 6004.2 | 546.5 | 37.2 |
| 12:33 | 90 | 846.9 | 6004.2 | 543.8 | 37.0 |
| 12:34 | 90 | 846.9 | 6004.2 | 544.9 | 37.1 |
| 12:35 | 90 | 846.9 | 6004.2 | 544.9 | 37.1 |
| 12:36 | 90 | 846.9 | 6004.2 | 542.8 | 37.0 |
| 12:37 | 90 | 846.9 | 6004.2 | 541.6 | 36.9 |
| 12:38 | 90 | 846.9 | 6004.2 | 541.8 | 36.9 |
| 12:39 | 90 | 844.6 | 6014.8 | 541.9 | 37.0 |
| Run 1 | 90.0 | 846.9 | 6004.3 | 570.0 | 38.8 |
| | | | | | |
| 13:02 | 90 | 851.1 | 5984.9 | 523.6 | 35.6 |
| 13:03 | 90 | 851.1 | 5984.9 | 523.1 | 35.5 |
| 13:04 | 90 | 851.1 | 5984.9 | 521.4 | 35.4 |
| 13:05 | 90 | 851.1 | 5984.9 | 520 | 35.3 |
| 13:06 | 90 | 851.1 | 5984.9 | 518.7 | 35.2 |
| 13:07 | 90 | 851.1 | 5984.9 | 519.4 | 35.3 |
| 13:08 | 90 | 851.1 | 5984.9 | 516.6 | 35.1 |
| 13:09 | 90 | 851.1 | 5984.9 | 516.9 | 35.1 |
| 13:10 | 90 | 851.1 | 5984.9 | 516.5 | 35.1 |
| 13:11 | 90 | 851.1 | 5984.9 | 516.6 | 35.1 |
| 13:12 | 90 | 851.1 | 5984.9 | 518 | 35.2 |
| 13:13 | 90 | 851.1 | 5984.9 | 520.1 | 35.3 |
| 13:14 | 90 | 851.1 | 5984.9 | 518.9 | 35.2 |
| 13:15 | 90 | 851.1 | 5984.9 | 515.8 | 35.0 |
| 13:16 | 90 | 851.1 | 5984.9 | 515.4 | 35.0 |
| 13:17 | 90 | 853.9 | 5972.2 | 515.6 | 34.9 |
| 13:18 | 90 | 853.9 | 5972.2 | 512.7 | 34.7 |
| 13:19 | 90 | 853.9 | 5972.2 | 514.6 | 34.9 |
| 13:20 | 90 | 853.9 | 5972.2 | 512.2 | 34.7 |
| 13:21 | 90 | 853.9 | 5972.2 | 511.8 | 34.7 |
| 13:22 | 90 | 853.9 | 5972.2 | 509.8 | 34.5 |
| 13:23 | 90 | 853.9 | 5972.2 | 507.9 | 34.4 |
| 13:24 | 90 | 853.9 | 5972.2 | 509.6 | 34.5 |
| 13:25 | 90 | 853.9 | 5972.2 | 512 | 34.7 |
| 13:26 | 90 | 853.9 | 5972.2 | 511.3 | 34.6 |
| 13:27 | 90 | 853.9 | 5972.2 | 511.8 | 34.7 |
| 13:28 | 90 | 853.9 | 5972.2 | 512.4 | 34.7 |
| 13:29 | 90 | 853.9 | 5972.2 | 513.9 | 34.8 |
| 13:30 | 90 | 853.9 | 5972.2 | 515.4 | 34.9 |
| 13:31 | 90 | 852.9 | 5976.7 | 516.3 | 35.0 |
| 13:32 | 90 | 852.9 | 5976.7 | 517.4 | 35.1 |
| 13:33 | 90 | 852.9 | 5976.7 | 516.9 | 35.1 |
| 13:34 | 90 | 852.9 | 5976.7 | 512.8 | 34.8 |
| 13:35 | 90 | 852.9 | 5976.7 | 513.9 | 34.8 |
| 13:36 | 90 | 852.9 | 5976.7 | 515.7 | 35.0 |

Unit 26

| | | | | | |
|---|---|---|---|---|---|
| 13:37 | 90 | 852.9 | 5976.7 | 515.6 | 35.0 |
| 13:38 | 90 | 852.9 | 5976.7 | 510.8 | 34.6 |
| 13:39 | 90 | 852.9 | 5976.7 | 505.9 | 34.3 |
| 13:40 | 90 | 852.9 | 5976.7 | 506.5 | 34.3 |
| 13:41 | 90 | 852.9 | 5976.7 | 510.2 | 34.6 |
| 13:42 | 90 | 852.9 | 5976.7 | 509.3 | 34.5 |
| 13:43 | 90 | 852.9 | 5976.7 | 506.9 | 34.4 |
| 13:44 | 90 | 852.9 | 5976.7 | 508.1 | 34.5 |
| 13:45 | 90 | 852.9 | 5976.7 | 507.3 | 34.4 |
| 13:46 | 90 | 852.9 | 5976.7 | 506.8 | 34.4 |
| 13:47 | 90 | 852.9 | 5976.7 | 506.6 | 34.4 |
| 13:48 | 90 | 852.9 | 5976.7 | 508.6 | 34.5 |
| 13:49 | 90 | 852.9 | 5976.7 | 509.7 | 34.6 |
| 13:50 | 90 | 852.9 | 5976.7 | 506.7 | 34.4 |
| 13:51 | 90 | 852.9 | 5976.7 | 506.5 | 34.3 |
| 13:52 | 90 | 852.5 | 5978.6 | 507.8 | 34.4 |
| 13:53 | 90 | 852.5 | 5978.6 | 509.1 | 34.5 |
| 13:54 | 90 | 852.5 | 5978.6 | 508.1 | 34.5 |
| 13:55 | 90 | 852.5 | 5978.6 | 506.9 | 34.4 |
| 13:56 | 90 | 852.5 | 5978.6 | 507.1 | 34.4 |
| 13:57 | 90 | 852.5 | 5978.6 | 509.1 | 34.5 |
| 13:58 | 90 | 852.5 | 5978.6 | 509.2 | 34.5 |
| 13:59 | 90 | 852.5 | 5978.6 | 507.2 | 34.4 |
| 14:00 | 90 | 852.5 | 5978.6 | 506.7 | 34.4 |
| 14:01 | 90 | 852.5 | 5978.6 | 507.8 | 34.4 |
| Run 2 | 90.0 | 852.7 | 5977.4 | 506.0 | 34.3 |
| 14:19 | 90 | 849.5 | 5992.2 | 649 | 44.1 |
| 14:20 | 90 | 849.5 | 5992.2 | 639.3 | 43.5 |
| 14:21 | 90 | 849.5 | 5992.2 | 639.6 | 43.5 |
| 14:22 | 90 | 849.5 | 5992.2 | 637.3 | 43.3 |
| 14:23 | 90 | 849.5 | 5992.2 | 639.9 | 43.5 |
| 14:24 | 90 | 849.5 | 5992.2 | 637.6 | 43.3 |
| 14:25 | 90 | 849.5 | 5992.2 | 633.1 | 43.0 |
| 14:26 | 90 | 849.5 | 5992.2 | 633.3 | 43.1 |
| 14:27 | 90 | 849.5 | 5992.2 | 630.6 | 42.9 |
| 14:28 | 90 | 849.5 | 5992.2 | 627.6 | 42.7 |
| 14:29 | 90 | 849.5 | 5992.2 | 623.8 | 42.4 |
| 14:30 | 90 | 849.5 | 5992.2 | 623 | 42.4 |
| 14:31 | 90 | 849.5 | 5992.2 | 619.7 | 42.1 |
| 14:32 | 90 | 849.5 | 5992.2 | 622.1 | 42.3 |
| 14:33 | 90 | 849.5 | 5992.2 | 625.6 | 42.5 |
| 14:34 | 90 | 849.5 | 5992.2 | 632.6 | 43.0 |
| 14:35 | 90 | 849.5 | 5992.2 | 636.5 | 43.3 |
| 14:36 | 90 | 849.5 | 5992.2 | 632.3 | 43.0 |
| 14:37 | 90 | 849.5 | 5992.2 | 630.7 | 42.9 |
| 14:38 | 90 | 853.4 | 5974.5 | 628.4 | 42.6 |
| 14:39 | 90 | 853.4 | 5974.5 | 630.7 | 42.8 |
| 14:40 | 90 | 853.4 | 5974.5 | 628.7 | 42.6 |
| 14:41 | 90 | 853.4 | 5974.5 | 628.1 | 42.6 |
| 14:42 | 90 | 853.4 | 5974.5 | 625.1 | 42.4 |
| 14:43 | 90 | 853.4 | 5974.5 | 625.9 | 42.4 |
| 14:44 | 90 | 853.4 | 5974.5 | 625.7 | 42.4 |

Unit 26

| | | | | | |
|---|---|---|---|---|---|
| 14:45 | 90 | 853.4 | 5974.5 | 625.9 | 42.4 |
| 14:46 | 90 | 853.4 | 5974.5 | 624.8 | 42.4 |
| 14:47 | 90 | 853.4 | 5974.5 | 623.2 | 42.2 |
| 14:48 | 90 | 853.4 | 5974.5 | 621.1 | 42.1 |
| 14:49 | 90 | 853.4 | 5974.5 | 622.2 | 42.2 |
| 14:50 | 90 | 853.4 | 5974.5 | 621.9 | 42.2 |
| 14:51 | 90 | 853.4 | 5974.5 | 619 | 42.0 |
| 14:52 | 90 | 853.4 | 5974.5 | 618.2 | 41.9 |
| 14:53 | 90 | 853.4 | 5974.5 | 619.6 | 42.0 |
| 14:54 | 90 | 853.4 | 5974.5 | 617.5 | 41.9 |
| 14:55 | 90 | 853.4 | 5974.5 | 617 | 41.8 |
| 14:56 | 90 | 854.6 | 5969.0 | 614.7 | 41.6 |
| 14:57 | 90 | 854.6 | 5969.0 | 612.5 | 41.5 |
| 14:58 | 90 | 854.6 | 5969.0 | 609.7 | 41.3 |
| 14:59 | 90 | 854.6 | 5969.0 | 613.3 | 41.5 |
| 15:00 | 90 | 854.6 | 5969.0 | 612.8 | 41.5 |
| 15:01 | 90 | 854.6 | 5969.0 | 611.6 | 41.4 |
| 15:02 | 90 | 854.6 | 5969.0 | 608.6 | 41.2 |
| 15:03 | 90 | 854.6 | 5969.0 | 610.2 | 41.3 |
| 15:04 | 90 | 854.6 | 5969.0 | 609.2 | 41.3 |
| 15:05 | 90 | 854.6 | 5969.0 | 606.7 | 41.1 |
| 15:06 | 90 | 854.6 | 5969.0 | 610.1 | 41.3 |
| 15:07 | 90 | 854.6 | 5969.0 | 611.8 | 41.4 |
| 15:08 | 90 | 854.6 | 5969.0 | 609.8 | 41.3 |
| 15:09 | 90 | 854.6 | 5969.0 | 606.9 | 41.1 |
| 15:10 | 90 | 854.6 | 5969.0 | 607.5 | 41.1 |
| 15:11 | 90 | 854.6 | 5969.0 | 607.9 | 41.2 |
| 15:12 | 90 | 855.2 | 5966.3 | 607.6 | 41.1 |
| 15:13 | 90 | 855.2 | 5966.3 | 608.6 | 41.2 |
| 15:14 | 90 | 855.2 | 5966.3 | 609.1 | 41.2 |
| 15:15 | 90 | 855.2 | 5966.3 | 606.7 | 41.1 |
| 15:16 | 90 | 855.2 | 5966.3 | 608.5 | 41.2 |
| 15:17 | 90 | 855.2 | 5966.3 | 609.6 | 41.3 |
| 15:18 | 90 | 855.2 | 5966.3 | 610 | 41.3 |
| Run 3 | 90.0 | 854.6 | 5968.9 | 615.0 | 41.6 |
| | Test Avg. | Test Avg. | Calc. Avg. | Corr. Avg. | Corr. lbs/Hour |

TECO
TAMPA ELECTRIC

# TEMPERATURE MEASUREMENTS
# FIELD DATA SHEET

Date 7/16/01

Facility Ring-Haver Unit No. 27 Location ~~Heater~~ DIS Outlet

Load (mw) 1.825 Pyrometer I. D. 28-02800 Operator D. Smith

RUN 1

| TIME | Temp. deg$^F$ |
|---|---|
| 1247 | 807.9 |
| 1302 | 820.5 |
| 1317 | 826.1 |
| 1332 | 826.9 |
| Avg. | 820.4 |

RUN 2

| TIME | Temp. deg$^F$ |
|---|---|
| 14:07 | 832.8 |
| 14:22 | 834.0 |
| 14:45 | 828.7 |
| 14:58 | 827.0 |
| Avg. | 830.6 |

RUN 3

| TIME | Temp. deg$^F$ |
|---|---|
| 15:19 | 830.5 |
| 15:34 | 832.6 |
| 15:58 | 834.7 |
| 16:15 | 834.2 |
| Avg. | 833.0 |

Unit 27

Molecular Weight of Emissions 76

| Time | Ambient Temperature [F] | Stack Temperature [F] | Corrected Flue Gas Volumetric Flow Rate [ft$^3$/min] | NOx [ppm] | Nox [lb/hr] |
|---|---|---|---|---|---|
| 12:47 | 32 | 807.9 | 5536.2 | 503.6 | 35.4 |
| 12:48 | 90 | 807.9 | 6188.9 | 500.5 | 35.1 |
| 12:49 | 90 | 807.9 | 6188.9 | 492.3 | 34.6 |
| 12:50 | 90 | 807.9 | 6188.9 | 499.7 | 35.1 |
| 12:51 | 90 | 807.9 | 6188.9 | 495.5 | 34.8 |
| 12:52 | 90 | 807.9 | 6188.9 | 489.4 | 34.4 |
| 12:53 | 90 | 807.9 | 6188.9 | 487.2 | 34.2 |
| 12:54 | 90 | 807.9 | 6188.9 | 481.8 | 33.8 |
| 12:55 | 90 | 807.9 | 6188.9 | 476 | 33.4 |
| 12:56 | 90 | 807.9 | 6188.9 | 478.4 | 33.6 |
| 12:57 | 90 | 807.9 | 6188.9 | 483.7 | 34.0 |
| 12:58 | 90 | 807.9 | 6188.9 | 481.9 | 33.8 |
| 12:59 | 90 | 807.9 | 6188.9 | 480.5 | 33.7 |
| 13:00 | 90 | 807.9 | 6188.9 | 477.1 | 33.5 |
| 13:01 | 90 | 807.9 | 6188.9 | 477.8 | 33.5 |
| 13:02 | 90 | 820.5 | 6128.0 | 480.9 | 33.4 |
| 13:03 | 90 | 820.5 | 6128.0 | 487.1 | 33.9 |
| 13:04 | 90 | 820.5 | 6128.0 | 484 | 33.7 |
| 13:05 | 90 | 820.5 | 6128.0 | 483.4 | 33.6 |
| 13:06 | 90 | 820.5 | 6128.0 | 483.4 | 33.6 |
| 13:07 | 90 | 820.5 | 6128.0 | 481.5 | 33.5 |
| 13:08 | 90 | 820.5 | 6128.0 | 488 | 33.9 |
| 13:09 | 90 | 820.5 | 6128.0 | 486.5 | 33.8 |
| 13:10 | 90 | 820.5 | 6128.0 | 489.3 | 34.0 |
| 13:11 | 90 | 820.5 | 6128.0 | 489.8 | 34.1 |
| 13:12 | 90 | 820.5 | 6128.0 | 488.9 | 34.0 |
| 13:13 | 90 | 820.5 | 6128.0 | 482.2 | 33.5 |
| 13:14 | 90 | 820.5 | 6128.0 | 485.2 | 33.7 |
| 13:15 | 90 | 820.5 | 6128.0 | 486.5 | 33.8 |
| 13:16 | 90 | 820.5 | 6128.0 | 486.9 | 33.9 |
| 13:17 | 90 | 826.1 | 6101.3 | 484.2 | 33.5 |
| 13:18 | 90 | 826.1 | 6101.3 | 482.3 | 33.4 |
| 13:19 | 90 | 826.1 | 6101.3 | 486.5 | 33.7 |
| 13:20 | 90 | 826.1 | 6101.3 | 487.5 | 33.7 |
| 13:21 | 90 | 826.1 | 6101.3 | 484.9 | 33.6 |
| 13:22 | 90 | 826.1 | 6101.3 | 483.3 | 33.5 |
| 13:23 | 90 | 826.1 | 6101.3 | 484.2 | 33.5 |
| 13:24 | 90 | 826.1 | 6101.3 | 487.4 | 33.7 |
| 13:25 | 90 | 826.1 | 6101.3 | 488.4 | 33.8 |
| 13:26 | 90 | 826.1 | 6101.3 | 515.6 | 35.7 |
| 13:27 | 90 | 826.1 | 6101.3 | 546.2 | 37.8 |
| 13:28 | 90 | 826.1 | 6101.3 | 542.7 | 37.6 |
| 13:29 | 90 | 826.1 | 6101.3 | 544 | 37.7 |
| 13:30 | 90 | 826.1 | 6101.3 | 539.5 | 37.3 |
| 13:31 | 90 | 826.1 | 6101.3 | 534.8 | 37.0 |

Unit 27

| | | | | | |
|---|---|---|---|---|---|
| 13:32 | 90 | 826.9 | 6097.5 | 536.9 | 37.1 |
| 13:33 | 90 | 826.9 | 6097.5 | 529.9 | 36.7 |
| 13:34 | 90 | 826.9 | 6097.5 | 522.2 | 36.1 |
| 13:35 | 90 | 826.9 | 6097.5 | 518.4 | 35.9 |
| 13:36 | 90 | 826.9 | 6097.5 | 524.2 | 36.3 |
| 13:37 | 90 | 826.9 | 6097.5 | 524.5 | 36.3 |
| 13:38 | 90 | 826.9 | 6097.5 | 520.8 | 36.0 |
| 13:39 | 90 | 826.9 | 6097.5 | 519 | 35.9 |
| 13:40 | 90 | 826.9 | 6097.5 | 512.7 | 35.5 |
| 13:41 | 90 | 826.9 | 6097.5 | 523.7 | 36.2 |
| 13:42 | 90 | 826.9 | 6097.5 | 522.5 | 36.1 |
| 13:43 | 90 | 826.9 | 6097.5 | 520.5 | 36.0 |
| 13:44 | 90 | 826.9 | 6097.5 | 507.2 | 35.1 |
| 13:45 | 90 | 826.9 | 6097.5 | 520.9 | 36.0 |
| 13:46 | 90 | 826.9 | 6097.5 | 527.1 | 36.5 |
| 13:47 | 90 | 826.9 | 6097.5 | 521.4 | 36.1 |
| Run 1 | 89.0 | 820.5 | 6117.7 | 504.0 | 35.0 |
| | | | | | |
| 14:07 | 90 | 832.8 | 6069.7 | 710.6 | 48.9 |
| 14:08 | 90 | 832.8 | 6069.7 | 716.9 | 49.4 |
| 14:09 | 90 | 832.8 | 6069.7 | 713.4 | 49.1 |
| 14:10 | 90 | 832.8 | 6069.7 | 710.2 | 48.9 |
| 14:11 | 90 | 832.8 | 6069.7 | 715 | 49.2 |
| 14:12 | 90 | 832.8 | 6069.7 | 708.5 | 48.8 |
| 14:13 | 90 | 832.8 | 6069.7 | 708.7 | 48.8 |
| 14:14 | 90 | 832.8 | 6069.7 | 711.6 | 49.0 |
| 14:15 | 90 | 832.8 | 6069.7 | 712.6 | 49.1 |
| 14:16 | 90 | 832.8 | 6069.7 | 713.5 | 49.1 |
| 14:17 | 90 | 832.8 | 6069.7 | 707.9 | 48.7 |
| 14:18 | 90 | 832.8 | 6069.7 | 709.6 | 48.9 |
| 14:19 | 90 | 832.8 | 6069.7 | 708.3 | 48.8 |
| 14:20 | 90 | 832.8 | 6069.7 | 707.6 | 48.7 |
| 14:21 | 90 | 834 | 6064.0 | 719.5 | 49.5 |
| 14:22 | 90 | 834 | 6064.0 | 716.2 | 49.3 |
| 14:23 | 90 | 834 | 6064.0 | 710.2 | 48.9 |
| 14:24 | 90 | 834 | 6064.0 | 706.2 | 48.6 |
| 14:25 | 90 | 834 | 6064.0 | 703.3 | 48.4 |
| 14:26 | 90 | 834 | 6064.0 | 703.9 | 48.4 |
| 14:27 | 90 | 834 | 6064.0 | 702.5 | 48.3 |
| 14:28 | 90 | 834 | 6064.0 | 697.7 | 48.0 |
| 14:29 | 90 | 834 | 6064.0 | 697.9 | 48.0 |
| 14:30 | 90 | 834 | 6064.0 | 692.8 | 47.7 |
| 14:31 | 90 | 834 | 6064.0 | 687.1 | 47.3 |
| 14:32 | 90 | 834 | 6064.0 | 694.3 | 47.8 |
| 14:33 | 90 | 834 | 6064.0 | 686.3 | 47.2 |
| 14:34 | 90 | 834 | 6064.0 | 716.7 | 49.3 |
| 14:35 | 90 | 834 | 6064.0 | 709 | 48.8 |
| 14:36 | 90 | 834 | 6064.0 | 712.1 | 49.0 |
| 14:37 | 90 | 834 | 6064.0 | 707.2 | 48.7 |
| 14:38 | 90 | 834 | 6064.0 | 710.8 | 48.9 |
| 14:39 | 90 | 834 | 6064.0 | 706.3 | 48.6 |
| 14:40 | 90 | 834 | 6064.0 | 710.1 | 48.9 |

Unit 27

| | | | | | |
|---|---|---|---|---|---|
| 14:41 | 90 | 834 | 6064.0 | 716 | 49.3 |
| 14:42 | 90 | 834 | 6064.0 | 703.3 | 48.4 |
| 14:43 | 90 | 834 | 6064.0 | 705.1 | 48.5 |
| 14:44 | 90 | 834 | 6064.0 | 709.9 | 48.8 |
| 14:45 | 90 | 828.7 | 6089.0 | 713 | 49.3 |
| 14:46 | 90 | 828.7 | 6089.0 | 719.2 | 49.7 |
| 14:47 | 90 | 828.7 | 6089.0 | 702.2 | 48.5 |
| 14:48 | 90 | 828.7 | 6089.0 | 702 | 48.5 |
| 14:49 | 90 | 828.7 | 6089.0 | 694.7 | 48.0 |
| 14:50 | 90 | 828.7 | 6089.0 | 695.2 | 48.0 |
| 14:51 | 90 | 828.7 | 6089.0 | 690.3 | 47.7 |
| 14:52 | 90 | 828.7 | 6089.0 | 703.1 | 48.6 |
| 14:53 | 90 | 828.7 | 6089.0 | 694.2 | 48.0 |
| 14:54 | 90 | 828.7 | 6089.0 | 690.8 | 47.7 |
| 14:55 | 90 | 828.7 | 6089.0 | 703.2 | 48.6 |
| 14:56 | 90 | 828.7 | 6089.0 | 697.3 | 48.2 |
| 14:57 | 90 | 828.7 | 6089.0 | 696 | 48.1 |
| 14:58 | 90 | 827 | 6097.0 | 689.1 | 47.7 |
| 14:59 | 90 | 827 | 6097.0 | 684 | 47.3 |
| 15:00 | 90 | 827 | 6097.0 | 687.5 | 47.6 |
| 15:01 | 90 | 827 | 6097.0 | 678 | 46.9 |
| 15:02 | 90 | 827 | 6097.0 | 680.5 | 47.1 |
| 15:03 | 90 | 827 | 6097.0 | 681.8 | 47.2 |
| 15:04 | 90 | 827 | 6097.0 | 682.8 | 47.2 |
| 15:05 | 90 | 827 | 6097.0 | 680.2 | 47.1 |
| 15:06 | 90 | 827 | 6097.0 | 676.9 | 46.8 |
| Run 2 | 90.0 | 831.5 | 6075.7 | 693.0 | 47.8 |
| | | | | | |
| 15:19 | 90 | 830.5 | 6080.5 | 513.8 | 35.4 |
| 15:20 | 90 | 830.5 | 6080.5 | 527.5 | 36.4 |
| 15:21 | 90 | 830.5 | 6080.5 | 515.8 | 35.6 |
| 15:22 | 90 | 830.5 | 6080.5 | 506.3 | 34.9 |
| 15:23 | 90 | 830.5 | 6080.5 | 508.2 | 35.1 |
| 15:24 | 90 | 830.5 | 6080.5 | 512.9 | 35.4 |
| 15:25 | 90 | 830.5 | 6080.5 | 518.1 | 35.7 |
| 15:26 | 90 | 830.5 | 6080.5 | 509.6 | 35.2 |
| 15:27 | 90 | 830.5 | 6080.5 | 502.5 | 34.7 |
| 15:28 | 90 | 830.5 | 6080.5 | 514.6 | 35.5 |
| 15:29 | 90 | 830.5 | 6080.5 | 510.4 | 35.2 |
| 15:30 | 90 | 830.5 | 6080.5 | 499.2 | 34.4 |
| 15:31 | 90 | 830.5 | 6080.5 | 504.3 | 34.8 |
| 15:32 | 90 | 830.5 | 6080.5 | 509.3 | 35.1 |
| 15:33 | 90 | 830.5 | 6080.5 | 514.3 | 35.5 |
| 15:34 | 90 | 832.6 | 6070.6 | 514.6 | 35.4 |
| 15:35 | 90 | 832.6 | 6070.6 | 519.4 | 35.8 |
| 15:36 | 90 | 832.6 | 6070.6 | 522.1 | 36.0 |
| 15:37 | 90 | 832.6 | 6070.6 | 510.1 | 35.1 |
| 15:38 | 90 | 832.6 | 6070.6 | 502.5 | 34.6 |
| 15:39 | 90 | 832.6 | 6070.6 | 492.5 | 33.9 |
| 15:40 | 90 | 832.6 | 6070.6 | 505.9 | 34.8 |
| 15:41 | 90 | 832.6 | 6070.6 | 511.6 | 35.2 |
| 15:42 | 90 | 832.6 | 6070.6 | 512.3 | 35.3 |

Unit 27

| | | | | | |
|---|---|---|---|---|---|
| 15:43 | 90 | 832.6 | 6070.6 | 513.7 | 35.4 |
| 15:44 | 90 | 832.6 | 6070.6 | 514.3 | 35.4 |
| 15:45 | 90 | 832.6 | 6070.6 | 494.7 | 34.1 |
| 15:46 | 90 | 832.6 | 6070.6 | 520.1 | 35.8 |
| 15:47 | 90 | 832.6 | 6070.6 | 511.5 | 35.2 |
| 15:48 | 90 | 832.6 | 6070.6 | 518.1 | 35.7 |
| 15:49 | 90 | 832.6 | 6070.6 | 517.1 | 35.6 |
| 15:50 | 90 | 832.6 | 6070.6 | 506.7 | 34.9 |
| 15:51 | 90 | 832.6 | 6070.6 | 510 | 35.1 |
| 15:52 | 90 | 832.6 | 6070.6 | 530.1 | 36.5 |
| 15:53 | 90 | 832.6 | 6070.6 | 525.1 | 36.2 |
| 15:54 | 90 | 832.6 | 6070.6 | 519.8 | 35.8 |
| 15:55 | 90 | 832.6 | 6070.6 | 525.8 | 36.2 |
| 15:56 | 90 | 832.6 | 6070.6 | 522.8 | 36.0 |
| 15:57 | 90 | 832.6 | 6070.6 | 525.1 | 36.2 |
| 15:58 | 90 | 834.7 | 6060.7 | 525.4 | 36.1 |
| 15:59 | 90 | 834.7 | 6060.7 | 518.3 | 35.6 |
| 16:00 | 90 | 834.7 | 6060.7 | 507.9 | 34.9 |
| 16:01 | 90 | 834.7 | 6060.7 | 515 | 35.4 |
| 16:02 | 90 | 834.7 | 6060.7 | 525.9 | 36.2 |
| 16:03 | 90 | 834.7 | 6060.7 | 514.4 | 35.4 |
| 16:04 | 90 | 834.7 | 6060.7 | 517.4 | 35.6 |
| 16:05 | 90 | 834.7 | 6060.7 | 514.1 | 35.4 |
| 16:06 | 90 | 834.7 | 6060.7 | 509.7 | 35.0 |
| 16:07 | 90 | 834.7 | 6060.7 | 507.8 | 34.9 |
| 16:08 | 90 | 834.7 | 6060.7 | 528.8 | 36.4 |
| 16:09 | 90 | 834.7 | 6060.7 | 508.3 | 35.0 |
| 16:10 | 90 | 834.7 | 6060.7 | 503.5 | 34.6 |
| 16:11 | 90 | 834.7 | 6060.7 | 515.1 | 35.4 |
| 16:12 | 90 | 834.7 | 6060.7 | 512.3 | 35.2 |
| 16:13 | 90 | 834.7 | 6060.7 | 511.7 | 35.2 |
| 16:14 | 90 | 834.7 | 6060.7 | 521.4 | 35.9 |
| 16:15 | 90 | 834.2 | 6063.1 | 515.9 | 35.5 |
| 16:16 | 90 | 834.2 | 6063.1 | 520.1 | 35.8 |
| 16:17 | 90 | 834.2 | 6063.1 | 512.5 | 35.3 |
| 16:18 | 90 | 834.2 | 6063.1 | 515.6 | 35.5 |
| Run 3 | 90.0 | 832.8 | 6069.8 | 507.0 | 34.9 |
| | Test Avg. | Test Avg. | Calc. Avg. | Corr. Avg. | Corr. lbs/Hour |

TECO
TAMPA ELECTRIC

# TEMPERATURE MEASUREMENTS
# FIELD DATA SHEET

Date 7/18/01

Facility Ring-Haver Unit No. 28 Location Outlet

Load (mw) 1.825 Pyrometer I. D. 28-02800 Operator D. Smith

RUN 1

| TIME | Temp. deg$^F$ |
|---|---|
| 09:31 | 836 |
| 10:11 | 855.3 |
| 10:22 | 847.6 |
| 10:29 | 847.9 |
| Avg. | 846.7 |

RUN 2

| TIME | Temp. deg$^F$ |
|---|---|
| 11:00 | 848.3 |
| 11:18 | 848.8 |
| 11:36 | 851.4 |
| 11:46 | 851.7 |
| Avg. | 850.0 |

RUN 3

| TIME | Temp. deg$^F$ |
|---|---|
| 12:07 | 850.3 |
| 12:26 | 851.8 |
| 12:53 | 859.1 |
| 13:04 | 857.0 |
| Avg. | 854.6 |

Unit 28

Molecular Weight of Emissions 76

| Time | Ambient Temperature [F] | Stack Temperature [F] | Corrected Flue Gas Volumetric Flow Rate [$ft^3$/min] | NOx [ppm] | Nox [lb/hr] |
|---|---|---|---|---|---|
| 9:29 | 90 | 836 | 6054.7 | 675.4 | 46.4 |
| 9:30 | 90 | 836 | 6054.7 | 668.7 | 45.9 |
| 9:31 | 90 | 836 | 6054.7 | 682.4 | 46.9 |
| 9:32 | 90 | 836 | 6054.7 | 676.6 | 46.5 |
| 9:33 | 90 | 836 | 6054.7 | 663.1 | 45.6 |
| 9:34 | 90 | 836 | 6054.7 | 653.1 | 44.9 |
| 9:35 | 90 | 836 | 6054.7 | 650.8 | 44.7 |
| 9:36 | 90 | 836 | 6054.7 | 646.5 | 44.4 |
| 9:37 | 90 | 836 | 6054.7 | 643.9 | 44.2 |
| 9:38 | 90 | 836 | 6054.7 | 639 | 43.9 |
| 9:39 | 90 | 836 | 6054.7 | 633.9 | 43.5 |
| 9:40 | 90 | 836 | 6054.7 | 627.9 | 43.1 |
| 9:41 | 90 | 836 | 6054.7 | 624 | 42.9 |
| 9:42 | 90 | 836 | 6054.7 | 620 | 42.6 |
| 9:43 | 90 | 836 | 6054.7 | 615.6 | 42.3 |
| 9:44 | 90 | 836 | 6054.7 | 614.2 | 42.2 |
| 9:45 | 90 | 836 | 6054.7 | 611.3 | 42.0 |
| 9:46 | 90 | 836 | 6054.7 | 610.9 | 42.0 |
| 9:47 | 90 | 836 | 6054.7 | 608.1 | 41.8 |
| 9:48 | 90 | 836 | 6054.7 | 605.7 | 41.6 |
| 9:49 | 90 | 836 | 6054.7 | 603.5 | 41.5 |
| 9:50 | 90 | 836 | 6054.7 | 602.6 | 41.4 |
| 9:51 | 90 | 836 | 6054.7 | 600.1 | 41.2 |
| 9:52 | 90 | 836 | 6054.7 | 595.4 | 40.9 |
| 9:53 | 90 | 836 | 6054.7 | 592.4 | 40.7 |
| 9:54 | 90 | 836 | 6054.7 | 587.7 | 40.4 |
| 9:55 | 90 | 836 | 6054.7 | 587 | 40.3 |
| 9:56 | 90 | 836 | 6054.7 | 586.2 | 40.3 |
| 9:57 | 90 | 836 | 6054.7 | 581.1 | 39.9 |
| 9:58 | 90 | 836 | 6054.7 | 579 | 39.8 |
| 9:59 | 90 | 836 | 6054.7 | 576.5 | 39.6 |
| 10:00 | 90 | 836 | 6054.7 | 576.3 | 39.6 |
| 10:01 | 90 | 836 | 6054.7 | 575.6 | 39.5 |
| 10:02 | 90 | 836 | 6054.7 | 572.6 | 39.3 |
| 10:03 | 90 | 836 | 6054.7 | 571.6 | 39.3 |
| 10:04 | 90 | 836 | 6054.7 | 567.4 | 39.0 |
| 10:05 | 90 | 836 | 6054.7 | 569.1 | 39.1 |
| 10:06 | 90 | 836 | 6054.7 | 567.2 | 39.0 |
| 10:07 | 90 | 836 | 6054.7 | 565.8 | 38.9 |
| 10:08 | 90 | 836 | 6054.7 | 566.8 | 38.9 |
| 10:09 | 90 | 836 | 6054.7 | 564.1 | 38.7 |
| 10:10 | 90 | 836 | 6054.7 | 561.9 | 38.6 |
| 10:11 | 90 | 855.3 | 5965.8 | 562.6 | 38.1 |
| 10:12 | 90 | 855.3 | 5965.8 | 565.3 | 38.3 |
| 10:13 | 90 | 855.3 | 5965.8 | 571.2 | 38.7 |

Unit 28

| | | | | | |
|---|---|---|---|---|---|
| 10:14 | 90 | 855.3 | 5965.8 | 570.3 | 38.6 |
| 10:15 | 90 | 855.3 | 5965.8 | 566 | 38.3 |
| 10:16 | 90 | 855.3 | 5965.8 | 562.4 | 38.1 |
| 10:17 | 90 | 855.3 | 5965.8 | 562.9 | 38.1 |
| 10:18 | 90 | 855.3 | 5965.8 | 562.5 | 38.1 |
| 10:19 | 90 | 855.3 | 5965.8 | 559.6 | 37.9 |
| 10:20 | 90 | 855.3 | 5965.8 | 557.7 | 37.7 |
| 10:21 | 90 | 855.3 | 5965.8 | 555 | 37.6 |
| 10:22 | 90 | 847.6 | 6001.0 | 558.5 | 38.0 |
| 10:23 | 90 | 847.6 | 6001.0 | 557.7 | 38.0 |
| 10:24 | 90 | 847.6 | 6001.0 | 554.8 | 37.8 |
| 10:25 | 90 | 847.6 | 6001.0 | 555 | 37.8 |
| 10:26 | 90 | 847.6 | 6001.0 | 552.3 | 37.6 |
| 10:27 | 90 | 847.6 | 6001.0 | 553.3 | 37.7 |
| 10:28 | 90 | 847.6 | 6001.0 | 553.5 | 37.7 |
| Run 1 | 90.0 | 840.9 | 6032.1 | 589.0 | 40.3 |
| | | | | | |
| 10:46 | 90 | 848.3 | 5997.7 | 542.9 | 36.9 |
| 10:47 | 90 | 848.3 | 5997.7 | 541.1 | 36.8 |
| 10:48 | 90 | 848.3 | 5997.7 | 543 | 36.9 |
| 10:49 | 90 | 848.3 | 5997.7 | 540 | 36.7 |
| 10:50 | 90 | 848.3 | 5997.7 | 540.5 | 36.8 |
| 10:51 | 90 | 848.3 | 5997.7 | 538.6 | 36.7 |
| 10:52 | 90 | 848.3 | 5997.7 | 536.7 | 36.5 |
| 10:53 | 90 | 848.3 | 5997.7 | 535.6 | 36.4 |
| 10:54 | 90 | 848.3 | 5997.7 | 535.9 | 36.5 |
| 10:55 | 90 | 848.3 | 5997.7 | 532.3 | 36.2 |
| 10:56 | 90 | 848.3 | 5997.7 | 527.1 | 35.9 |
| 10:57 | 90 | 848.3 | 5997.7 | 528.3 | 35.9 |
| 10:58 | 90 | 848.3 | 5997.7 | 528.4 | 36.0 |
| 10:59 | 90 | 848.3 | 5997.7 | 528 | 35.9 |
| 11:00 | 90 | 848.3 | 5997.7 | 528 | 35.9 |
| 11:01 | 90 | 848.3 | 5997.7 | 524.9 | 35.7 |
| 11:02 | 90 | 848.3 | 5997.7 | 522.9 | 35.6 |
| 11:03 | 90 | 848.3 | 5997.7 | 523.8 | 35.6 |
| 11:04 | 90 | 848.3 | 5997.7 | 526.9 | 35.9 |
| 11:05 | 90 | 848.3 | 5997.7 | 526.1 | 35.8 |
| 11:06 | 90 | 848.3 | 5997.7 | 525.3 | 35.7 |
| 11:07 | 90 | 848.3 | 5997.7 | 524 | 35.7 |
| 11:08 | 90 | 848.3 | 5997.7 | 520.2 | 35.4 |
| 11:09 | 90 | 848.3 | 5997.7 | 518.8 | 35.3 |
| 11:10 | 90 | 848.3 | 5997.7 | 522.7 | 35.6 |
| 11:11 | 90 | 848.3 | 5997.7 | 523.3 | 35.6 |
| 11:12 | 90 | 848.3 | 5997.7 | 518.8 | 35.3 |
| 11:13 | 90 | 848.3 | 5997.7 | 518.4 | 35.3 |
| 11:14 | 90 | 848.3 | 5997.7 | 518 | 35.2 |
| 11:15 | 90 | 848.3 | 5997.7 | 520.7 | 35.4 |
| 11:16 | 90 | 848.3 | 5997.7 | 521.2 | 35.5 |
| 11:17 | 90 | 848.3 | 5997.7 | 522.6 | 35.6 |
| 11:18 | 90 | 848.8 | 5995.5 | 522 | 35.5 |
| 11:19 | 90 | 848.8 | 5995.5 | 519.9 | 35.4 |
| 11:20 | 90 | 848.8 | 5995.5 | 521 | 35.4 |

Unit 28

| | | | | | |
|---|---|---|---|---|---|
| 11:21 | 90 | 848.8 | 5995.5 | 520.8 | 35.4 |
| 11:22 | 90 | 848.8 | 5995.5 | 519.1 | 35.3 |
| 11:23 | 90 | 848.8 | 5995.5 | 519.5 | 35.3 |
| 11:24 | 90 | 848.8 | 5995.5 | 520.8 | 35.4 |
| 11:25 | 90 | 848.8 | 5995.5 | 522.9 | 35.6 |
| 11:26 | 90 | 848.8 | 5995.5 | 521 | 35.4 |
| 11:27 | 90 | 848.8 | 5995.5 | 518.5 | 35.3 |
| 11:28 | 90 | 848.8 | 5995.5 | 515.8 | 35.1 |
| 11:29 | 90 | 848.8 | 5995.5 | 516.4 | 35.1 |
| 11:30 | 90 | 848.8 | 5995.5 | 516.4 | 35.1 |
| 11:31 | 90 | 848.8 | 5995.5 | 514.2 | 35.0 |
| 11:32 | 90 | 848.8 | 5995.5 | 515.1 | 35.0 |
| 11:33 | 90 | 848.8 | 5995.5 | 513.9 | 35.0 |
| 11:34 | 90 | 848.8 | 5995.5 | 516.6 | 35.1 |
| 11:35 | 90 | 848.8 | 5995.5 | 517.3 | 35.2 |
| 11:36 | 90 | 851.4 | 5983.6 | 518.9 | 35.2 |
| 11:37 | 90 | 851.4 | 5983.6 | 517.8 | 35.2 |
| 11:38 | 90 | 851.4 | 5983.6 | 520.4 | 35.3 |
| 11:39 | 90 | 851.4 | 5983.6 | 517.2 | 35.1 |
| 11:40 | 90 | 851.4 | 5983.6 | 516.1 | 35.0 |
| 11:41 | 90 | 851.4 | 5983.6 | 515 | 35.0 |
| 11:42 | 90 | 851.4 | 5983.6 | 515.3 | 35.0 |
| 11:43 | 90 | 851.4 | 5983.6 | 516.7 | 35.1 |
| 11:44 | 90 | 851.4 | 5983.6 | 515.8 | 35.0 |
| 11:45 | 90 | 851.4 | 5983.6 | 520 | 35.3 |
| Run 2 | 90.0 | 849.0 | 5994.7 | 523.0 | 35.6 |
| | | | | | |
| 12:07 | 90 | 850.3 | 5988.6 | 539.6 | 36.7 |
| 12:08 | 90 | 850.3 | 5988.6 | 539 | 36.6 |
| 12:09 | 90 | 850.3 | 5988.6 | 536.2 | 36.4 |
| 12:10 | 90 | 850.3 | 5988.6 | 532.3 | 36.2 |
| 12:11 | 90 | 850.3 | 5988.6 | 526.8 | 35.8 |
| 12:12 | 90 | 850.3 | 5988.6 | 525 | 35.7 |
| 12:13 | 90 | 850.3 | 5988.6 | 522.7 | 35.5 |
| 12:14 | 90 | 850.3 | 5988.6 | 520.8 | 35.4 |
| 12:15 | 90 | 850.3 | 5988.6 | 519.9 | 35.3 |
| 12:16 | 90 | 850.3 | 5988.6 | 517.7 | 35.2 |
| 12:17 | 90 | 850.3 | 5988.6 | 515.8 | 35.0 |
| 12:18 | 90 | 850.3 | 5988.6 | 514.1 | 34.9 |
| 12:19 | 90 | 850.3 | 5988.6 | 516.3 | 35.1 |
| 12:20 | 90 | 850.3 | 5988.6 | 517.8 | 35.2 |
| 12:21 | 90 | 850.3 | 5988.6 | 516.9 | 35.1 |
| 12:22 | 90 | 850.3 | 5988.6 | 518.3 | 35.2 |
| 12:23 | 90 | 850.3 | 5988.6 | 525.3 | 35.7 |
| 12:24 | 90 | 850.3 | 5988.6 | 523 | 35.5 |
| 12:25 | 90 | 850.3 | 5988.6 | 516.1 | 35.1 |
| 12:26 | 90 | 851.8 | 5981.7 | 513.9 | 34.9 |
| 12:27 | 90 | 851.8 | 5981.7 | 519.4 | 35.2 |
| 12:28 | 90 | 851.8 | 5981.7 | 519.4 | 35.2 |
| 12:29 | 90 | 851.8 | 5981.7 | 515.5 | 35.0 |
| 12:30 | 90 | 851.8 | 5981.7 | 517 | 35.1 |
| 12:31 | 90 | 851.8 | 5981.7 | 516.2 | 35.0 |

Unit 28

| | | | | | |
|---|---|---|---|---|---|
| 12:32 | 90 | 851.8 | 5981.7 | 513.6 | 34.9 |
| 12:33 | 90 | 851.8 | 5981.7 | 514.2 | 34.9 |
| 12:34 | 90 | 851.8 | 5981.7 | 514.4 | 34.9 |
| 12:35 | 90 | 851.8 | 5981.7 | 512.8 | 34.8 |
| 12:36 | 90 | 851.8 | 5981.7 | 512.2 | 34.8 |
| 12:37 | 90 | 851.8 | 5981.7 | 509.3 | 34.6 |
| 12:38 | 90 | 851.8 | 5981.7 | 506.3 | 34.4 |
| 12:39 | 90 | 851.8 | 5981.7 | 504.5 | 34.2 |
| 12:40 | 90 | 851.8 | 5981.7 | 504.6 | 34.2 |
| 12:41 | 90 | 851.8 | 5981.7 | 504.8 | 34.3 |
| 12:42 | 90 | 851.8 | 5981.7 | 505.3 | 34.3 |
| 12:43 | 90 | 851.8 | 5981.7 | 503.5 | 34.2 |
| 12:44 | 90 | 851.8 | 5981.7 | 505 | 34.3 |
| 12:45 | 90 | 851.8 | 5981.7 | 503.8 | 34.2 |
| 12:46 | 90 | 851.8 | 5981.7 | 505.7 | 34.3 |
| 12:47 | 90 | 851.8 | 5981.7 | 506.8 | 34.4 |
| 12:48 | 90 | 851.8 | 5981.7 | 504.7 | 34.3 |
| 12:49 | 90 | 851.8 | 5981.7 | 504.4 | 34.2 |
| 12:50 | 90 | 851.8 | 5981.7 | 502.7 | 34.1 |
| 12:51 | 90 | 851.8 | 5981.7 | 502.1 | 34.1 |
| 12:52 | 90 | 851.8 | 5981.7 | 489.1 | 33.2 |
| 12:53 | 90 | 859.1 | 5948.6 | 482.6 | 32.6 |
| 12:54 | 90 | 859.1 | 5948.6 | 479.7 | 32.4 |
| 12:55 | 90 | 859.1 | 5948.6 | 478.2 | 32.3 |
| 12:56 | 90 | 859.1 | 5948.6 | 478.7 | 32.3 |
| 12:57 | 90 | 859.1 | 5948.6 | 478.7 | 32.3 |
| 12:58 | 90 | 859.1 | 5948.6 | 479.2 | 32.3 |
| 12:59 | 90 | 859.1 | 5948.6 | 479.9 | 32.4 |
| 13:00 | 90 | 859.1 | 5948.6 | 480.5 | 32.4 |
| 13:01 | 90 | 859.1 | 5948.6 | 480.1 | 32.4 |
| 13:02 | 90 | 859.1 | 5948.6 | 479.8 | 32.4 |
| 13:03 | 90 | 859.1 | 5948.6 | 478.7 | 32.3 |
| 13:04 | 90 | 859.1 | 5948.6 | 477.8 | 32.2 |
| 13:05 | 90 | 859.1 | 5948.6 | 478.3 | 32.3 |
| 13:06 | 90 | 859.1 | 5948.6 | 478.5 | 32.3 |
| Run 3 | 90.0 | 853.0 | 5976.2 | 508.0 | 34.4 |
| | Test Avg. | Test Avg. | Calc. Avg. | Corr. Avg. | Corr. lbs/Hour |

TECO
TAMPA ELECTRIC

# TEMPERATURE MEASUREMENTS
# FIELD DATA SHEET

Date 7/18/01

Facility H.P. Ring-Haver Unit No. 29 Location Outlet

Load (mw) 1.825 Pyrometer I. D. 28-02800 Operator D. Smith

RUN 1

| TIME | Temp. deg$^F$ |
|---|---|
| 14:20 | 903.4 |
| 14:35 | 905.8 |
| 14:50 | 907.3 |
| 15:07 | 909.1 |
| Avg. | 906.4 |

RUN 2

| TIME | Temp. deg$^F$ |
|---|---|
| 15:39 | 910.8 |
| 15:56 | 905.8 |
| 16:17 | 905.8 |
| 16:29 | 906.1 |
| Avg. | 907.1 |

RUN 3

| TIME | Temp. deg$^F$ |
|---|---|
| 16:51 | 905.0 |
| 17:04 | 903.0 |
| 17:25 | 901.3 |
| 17:47 | 899.5 |
| Avg. | 902.2 |

Unit 29

Molecular Weight of Emissions 76

| Time | Ambient Temperature [F] | Stack Temperature [F] | Corrected Flue Gas Volumetric Flow Rate [$ft^3$/min] | NOx [ppm] | Nox [lb/hr] |
|---|---|---|---|---|---|
| 14:16 | 90 | 903.4 | 5755.4 | 563.2 | 36.8 |
| 14:17 | 90 | 903.4 | 5755.4 | 559.3 | 36.5 |
| 14:18 | 90 | 903.4 | 5755.4 | 556.6 | 36.3 |
| 14:19 | 90 | 903.4 | 5755.4 | 558.5 | 36.5 |
| 14:20 | 90 | 903.4 | 5755.4 | 558 | 36.4 |
| 14:21 | 90 | 903.4 | 5755.4 | 558.4 | 36.5 |
| 14:22 | 90 | 903.4 | 5755.4 | 562.3 | 36.7 |
| 14:23 | 90 | 903.4 | 5755.4 | 562.1 | 36.7 |
| 14:24 | 90 | 903.4 | 5755.4 | 566.7 | 37.0 |
| 14:25 | 90 | 903.4 | 5755.4 | 567.8 | 37.1 |
| 14:26 | 90 | 903.4 | 5755.4 | 567.3 | 37.0 |
| 14:27 | 90 | 903.4 | 5755.4 | 565.1 | 36.9 |
| 14:28 | 90 | 903.4 | 5755.4 | 566.7 | 37.0 |
| 14:29 | 90 | 903.4 | 5755.4 | 566 | 37.0 |
| 14:30 | 90 | 903.4 | 5755.4 | 563.5 | 36.8 |
| 14:31 | 90 | 903.4 | 5755.4 | 565.9 | 37.0 |
| 14:32 | 90 | 903.4 | 5755.4 | 573.1 | 37.4 |
| 14:33 | 90 | 903.4 | 5755.4 | 574.4 | 37.5 |
| 14:34 | 90 | 903.4 | 5755.4 | 573 | 37.4 |
| 14:35 | 90 | 905.8 | 5745.2 | 577.4 | 37.6 |
| 14:36 | 90 | 905.8 | 5745.2 | 577.3 | 37.6 |
| 14:37 | 90 | 905.8 | 5745.2 | 573.7 | 37.4 |
| 14:38 | 90 | 905.8 | 5745.2 | 576 | 37.5 |
| 14:39 | 90 | 905.8 | 5745.2 | 575.7 | 37.5 |
| 14:40 | 90 | 905.8 | 5745.2 | 576.3 | 37.6 |
| 14:41 | 90 | 905.8 | 5745.2 | 573.5 | 37.4 |
| 14:42 | 90 | 905.8 | 5745.2 | 573.6 | 37.4 |
| 14:43 | 90 | 905.8 | 5745.2 | 575.5 | 37.5 |
| 14:44 | 90 | 905.8 | 5745.2 | 573.7 | 37.4 |
| 14:45 | 90 | 905.8 | 5745.2 | 569.7 | 37.1 |
| 14:46 | 90 | 905.8 | 5745.2 | 567.7 | 37.0 |
| 14:47 | 90 | 905.8 | 5745.2 | 566.6 | 36.9 |
| 14:48 | 90 | 905.8 | 5745.2 | 566.4 | 36.9 |
| 14:49 | 90 | 905.8 | 5745.2 | 573.8 | 37.4 |
| 14:50 | 90 | 907.3 | 5738.9 | 572.8 | 37.3 |
| 14:51 | 90 | 907.3 | 5738.9 | 570.3 | 37.1 |
| 14:52 | 90 | 907.3 | 5738.9 | 569.6 | 37.1 |
| 14:53 | 90 | 907.3 | 5738.9 | 570.4 | 37.1 |
| 14:54 | 90 | 907.3 | 5738.9 | 568.8 | 37.0 |
| 14:55 | 90 | 907.3 | 5738.9 | 568.1 | 37.0 |
| 14:56 | 90 | 907.3 | 5738.9 | 566.1 | 36.9 |
| 14:57 | 90 | 907.3 | 5738.9 | 565.9 | 36.8 |
| 14:58 | 90 | 907.3 | 5738.9 | 566.4 | 36.9 |
| 14:59 | 90 | 907.3 | 5738.9 | 565 | 36.8 |
| 15:00 | 90 | 907.3 | 5738.9 | 561.8 | 36.6 |

Unit 29

| | | | | | |
|---|---|---|---|---|---|
| 15:01 | 90 | 907.3 | 5738.9 | 561.3 | 36.5 |
| 15:02 | 90 | 907.3 | 5738.9 | 559.5 | 36.4 |
| 15:03 | 90 | 907.3 | 5738.9 | 563.2 | 36.7 |
| 15:04 | 90 | 907.3 | 5738.9 | 564.8 | 36.8 |
| 15:05 | 90 | 907.3 | 5738.9 | 563.8 | 36.7 |
| 15:06 | 90 | 907.3 | 5738.9 | 558.7 | 36.4 |
| 15:07 | 90 | 909.1 | 5731.4 | 561.9 | 36.5 |
| 15:08 | 90 | 909.1 | 5731.4 | 567.7 | 36.9 |
| 15:09 | 90 | 909.1 | 5731.4 | 561.6 | 36.5 |
| 15:10 | 90 | 909.1 | 5731.4 | 565.3 | 36.8 |
| 15:11 | 90 | 909.1 | 5731.4 | 564.6 | 36.7 |
| 15:12 | 90 | 909.1 | 5731.4 | 565.4 | 36.8 |
| 15:13 | 90 | 909.1 | 5731.4 | 566 | 36.8 |
| 15:14 | 90 | 909.1 | 5731.4 | 564.1 | 36.7 |
| 15:15 | 90 | 909.1 | 5731.4 | 564.5 | 36.7 |
| Run 1 | 90.0 | 906.0 | 5744.6 | 561.0 | 36.6 |
| | | | | | |
| 15:34 | 90 | 906.4 | 5742.7 | 587.7 | 38.3 |
| 15:35 | 90 | 906.4 | 5742.7 | 587.6 | 38.3 |
| 15:36 | 90 | 906.4 | 5742.7 | 583.4 | 38.0 |
| 15:37 | 90 | 906.4 | 5742.7 | 581.9 | 37.9 |
| 15:38 | 90 | 906.4 | 5742.7 | 582.7 | 38.0 |
| 15:39 | 90 | 910.8 | 5724.3 | 576.9 | 37.5 |
| 15:40 | 90 | 910.8 | 5724.3 | 577.2 | 37.5 |
| 15:41 | 90 | 910.8 | 5724.3 | 580.4 | 37.7 |
| 15:42 | 90 | 910.8 | 5724.3 | 574.3 | 37.3 |
| 15:43 | 90 | 910.8 | 5724.3 | 571.9 | 37.1 |
| 15:44 | 90 | 910.8 | 5724.3 | 572.2 | 37.2 |
| 15:45 | 90 | 910.8 | 5724.3 | 568.4 | 36.9 |
| 15:46 | 90 | 910.8 | 5724.3 | 569.7 | 37.0 |
| 15:47 | 90 | 910.8 | 5724.3 | 574.3 | 37.3 |
| 15:48 | 90 | 910.8 | 5724.3 | 572.7 | 37.2 |
| 15:49 | 90 | 910.8 | 5724.3 | 572.5 | 37.2 |
| 15:50 | 90 | 910.8 | 5724.3 | 566.9 | 36.8 |
| 15:51 | 90 | 910.8 | 5724.3 | 564.2 | 36.6 |
| 15:52 | 90 | 910.8 | 5724.3 | 563.6 | 36.6 |
| 15:53 | 90 | 910.8 | 5724.3 | 563.8 | 36.6 |
| 15:54 | 90 | 910.8 | 5724.3 | 560.7 | 36.4 |
| 15:55 | 90 | 910.8 | 5724.3 | 563 | 36.6 |
| 15:56 | 90 | 905.8 | 5745.2 | 564.7 | 36.8 |
| 15:57 | 90 | 905.8 | 5745.2 | 563 | 36.7 |
| 15:58 | 90 | 905.8 | 5745.2 | 562.3 | 36.7 |
| 15:59 | 90 | 905.8 | 5745.2 | 558.9 | 36.4 |
| 16:00 | 90 | 905.8 | 5745.2 | 558.6 | 36.4 |
| 16:01 | 90 | 905.8 | 5745.2 | 557.5 | 36.3 |
| 16:02 | 90 | 905.8 | 5745.2 | 560.3 | 36.5 |
| 16:03 | 90 | 905.8 | 5745.2 | 559.5 | 36.5 |
| 16:04 | 90 | 905.8 | 5745.2 | 558.2 | 36.4 |
| 16:05 | 90 | 905.8 | 5745.2 | 558.8 | 36.4 |
| 16:06 | 90 | 905.8 | 5745.2 | 559.3 | 36.5 |
| 16:07 | 90 | 905.8 | 5745.2 | 559.8 | 36.5 |
| 16:08 | 90 | 905.8 | 5745.2 | 561.5 | 36.6 |

Unit 29

| | | | | | |
|---|---|---|---|---|---|
| 16:09 | 90 | 905.8 | 5745.2 | 560.1 | 36.5 |
| 16:10 | 90 | 905.8 | 5745.2 | 561.2 | 36.6 |
| 16:11 | 90 | 905.8 | 5745.2 | 563.5 | 36.7 |
| 16:12 | 90 | 905.8 | 5745.2 | 562.3 | 36.7 |
| 16:13 | 90 | 905.8 | 5745.2 | 563.4 | 36.7 |
| 16:14 | 90 | 905.8 | 5745.2 | 561.3 | 36.6 |
| 16:15 | 90 | 905.8 | 5745.2 | 563.5 | 36.7 |
| 16:16 | 90 | 905.8 | 5745.2 | 559.2 | 36.5 |
| 16:17 | 90 | 905.8 | 5745.2 | 561.6 | 36.6 |
| 16:18 | 90 | 905.8 | 5745.2 | 561.4 | 36.6 |
| 16:19 | 90 | 905.8 | 5745.2 | 560 | 36.5 |
| 16:20 | 90 | 905.8 | 5745.2 | 561.8 | 36.6 |
| 16:21 | 90 | 905.8 | 5745.2 | 561.1 | 36.6 |
| 16:22 | 90 | 905.8 | 5745.2 | 556.8 | 36.3 |
| 16:23 | 90 | 905.8 | 5745.2 | 559.5 | 36.5 |
| 16:24 | 90 | 905.8 | 5745.2 | 560.6 | 36.5 |
| 16:25 | 90 | 905.8 | 5745.2 | 561.1 | 36.6 |
| 16:26 | 90 | 905.8 | 5745.2 | 560.6 | 36.5 |
| 16:27 | 90 | 905.8 | 5745.2 | 558.7 | 36.4 |
| 16:28 | 90 | 905.8 | 5745.2 | 565.5 | 36.9 |
| 16:29 | 90 | 906.1 | 5744.0 | 565.1 | 36.8 |
| 16:30 | 90 | 906.1 | 5744.0 | 565.7 | 36.9 |
| 16:31 | 90 | 906.1 | 5744.0 | 566.8 | 36.9 |
| 16:32 | 90 | 906.1 | 5744.0 | 561.8 | 36.6 |
| 16:33 | 90 | 906.1 | 5744.0 | 564.2 | 36.8 |
| Run 2 | 90.0 | 907.3 | 5739.0 | 561.0 | 36.5 |
| | | | | | |
| 16:51 | 90 | 905 | 5748.6 | 571.5 | 37.3 |
| 16:52 | 90 | 905 | 5748.6 | 569.3 | 37.1 |
| 16:53 | 90 | 905 | 5748.6 | 565.7 | 36.9 |
| 16:54 | 90 | 905 | 5748.6 | 568.6 | 37.1 |
| 16:55 | 90 | 905 | 5748.6 | 569.7 | 37.2 |
| 16:56 | 90 | 905 | 5748.6 | 567.3 | 37.0 |
| 16:57 | 90 | 905 | 5748.6 | 562.3 | 36.7 |
| 16:58 | 90 | 905 | 5748.6 | 560.1 | 36.5 |
| 16:59 | 90 | 905 | 5748.6 | 562.4 | 36.7 |
| 17:00 | 90 | 905 | 5748.6 | 559.6 | 36.5 |
| 17:01 | 90 | 905 | 5748.6 | 558.8 | 36.4 |
| 17:02 | 90 | 905 | 5748.6 | 557.6 | 36.4 |
| 17:03 | 90 | 905 | 5748.6 | 558.1 | 36.4 |
| 17:04 | 90 | 903 | 5757.0 | 558.3 | 36.5 |
| 17:05 | 90 | 903 | 5757.0 | 557 | 36.4 |
| 17:06 | 90 | 903 | 5757.0 | 554.5 | 36.2 |
| 17:07 | 90 | 903 | 5757.0 | 554.3 | 36.2 |
| 17:08 | 90 | 903 | 5757.0 | 553.3 | 36.1 |
| 17:09 | 90 | 903 | 5757.0 | 554 | 36.2 |
| 17:10 | 90 | 903 | 5757.0 | 552.6 | 36.1 |
| 17:11 | 90 | 903 | 5757.0 | 552.2 | 36.1 |
| 17:12 | 90 | 903 | 5757.0 | 551.9 | 36.0 |
| 17:13 | 90 | 903 | 5757.0 | 551.4 | 36.0 |
| 17:14 | 90 | 903 | 5757.0 | 550.7 | 36.0 |
| 17:15 | 90 | 903 | 5757.0 | 550.3 | 35.9 |

Unit 29

| | | | | | |
|---|---|---|---|---|---|
| 17:16 | 90 | 903 | 5757.0 | 553.3 | 36.1 |
| 17:17 | 90 | 903 | 5757.0 | 552.2 | 36.1 |
| 17:18 | 90 | 903 | 5757.0 | 551.6 | 36.0 |
| 17:19 | 90 | 903 | 5757.0 | 551.8 | 36.0 |
| 17:20 | 90 | 903 | 5757.0 | 553.4 | 36.1 |
| 17:21 | 90 | 903 | 5757.0 | 554.4 | 36.2 |
| 17:22 | 90 | 903 | 5757.0 | 553.1 | 36.1 |
| 17:23 | 90 | 903 | 5757.0 | 553.3 | 36.1 |
| 17:24 | 90 | 903 | 5757.0 | 551.9 | 36.0 |
| 17:25 | 90 | 901.3 | 5764.2 | 551.7 | 36.1 |
| 17:26 | 90 | 901.3 | 5764.2 | 549.9 | 36.0 |
| 17:27 | 90 | 901.3 | 5764.2 | 547.7 | 35.8 |
| 17:28 | 90 | 901.3 | 5764.2 | 546.2 | 35.7 |
| 17:29 | 90 | 901.3 | 5764.2 | 549.6 | 35.9 |
| 17:30 | 90 | 901.3 | 5764.2 | 548.9 | 35.9 |
| 17:31 | 90 | 901.3 | 5764.2 | 544.6 | 35.6 |
| 17:32 | 90 | 901.3 | 5764.2 | 549.7 | 35.9 |
| 17:33 | 90 | 901.3 | 5764.2 | 552.2 | 36.1 |
| 17:34 | 90 | 901.3 | 5764.2 | 552.8 | 36.2 |
| 17:35 | 90 | 901.3 | 5764.2 | 552.6 | 36.1 |
| 17:36 | 90 | 901.3 | 5764.2 | 550.2 | 36.0 |
| 17:37 | 90 | 901.3 | 5764.2 | 553.3 | 36.2 |
| 17:38 | 90 | 901.3 | 5764.2 | 553.1 | 36.2 |
| 17:39 | 90 | 901.3 | 5764.2 | 553 | 36.2 |
| 17:40 | 90 | 901.3 | 5764.2 | 553.9 | 36.2 |
| 17:41 | 90 | 901.3 | 5764.2 | 552.8 | 36.2 |
| 17:42 | 90 | 901.3 | 5764.2 | 549.7 | 35.9 |
| 17:43 | 90 | 901.3 | 5764.2 | 549.3 | 35.9 |
| 17:44 | 90 | 901.3 | 5764.2 | 551.1 | 36.0 |
| 17:45 | 90 | 901.3 | 5764.2 | 550 | 36.0 |
| 17:46 | 90 | 901.3 | 5764.2 | 548.6 | 35.9 |
| 17:47 | 90 | 899.5 | 5771.9 | 550.4 | 36.0 |
| 17:48 | 90 | 899.5 | 5771.9 | 553 | 36.2 |
| 17:49 | 90 | 899.5 | 5771.9 | 552.3 | 36.2 |
| 17:50 | 90 | 899.5 | 5771.9 | 549.3 | 36.0 |
| Run 2 | 90.0 | 902.6 | 5758.8 | 550.0 | 35.9 |
| | Test Avg. | Test Avg. | Calc. Avg. | Corr. Avg. | Corr. lbs/Hour |

TECO
TAMPA ELECTRIC

# TEMPERATURE MEASUREMENTS
# FIELD DATA SHEET

**Date** 7/19/01

**Facility** Hookers Ring-Haver **Unit No.** 30 **Location** Outlet

**Load (mw)** 1.825 **Pyrometer I. D.** 28-02800 **Operator** D. Smith

RUN 1

| TIME | Temp. deg$^F$ |
|---|---|
| 06:59 | 834.5 |
| 07:15 | 836.6 |
| 07:29 | 839.7 |
| 07:46 | 845.4 |
| Avg. | 839.1 |

RUN 2

| TIME | Temp. deg$^F$ |
|---|---|
| 08:18 | 847.5 |
| 08:33 | 849.9 |
| 08:52 | 850.2 |
| 09:06 | 850.2 |
| Avg. | 849.4 |

RUN 3

| TIME | Temp. deg$^F$ |
|---|---|
| ~~10:27~~ 09:29 | 850.6 |
| 09:46 | 853.2 |
| 10:00 | 853.4 |
| 10:16 | 855.4 |
| Avg. | 853.2 |

# TEST PARTICIPANTS

## Tampa Electric Company

| | |
|---|---|
| Raymond McDarby | Sr. Environmental Technician |
| David Perez | Boiler Turbine Operator |
| David Smith | Coordinator – Air Services |
| Shannon Todd | Principle Engineer |

## Ring Haver

| | |
|---|---|
| Carlos Acosta | Technician |

## Hillsborough County EPC

| | |
|---|---|
| Alan Rodriguez | Compliance Engineer |

## Florida Environmental Protection Commission

| | |
|---|---|
| Martin Costello | Professional Engineer |