7 APPENDICES

A. Source Emissions Calculations
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APPENDIX A

Nomenclature and Equations
for
Calculation of Source Emissions

NOMENCLATURE FOR PARTICULATE CALCULATIONS

Symbol	English Units	Metric Units	Description
A_s	in.^{2}	m^2	Stack Area
C_{an}	gr/dscf*	g/dscm*	Particulate - probe, cyclone, and filter
C_{ao}	gr/dscf*	g/dscm*	Particulate - total
C_{at}	gr/CF @ stack conditions	g/m^3	Particulate - probe, cyclone, and filter
C_{au}	gr/CF @ stack conditions	g/m^3	Particulate - total
C_{aw}	lbs/hr	kg/hr	Particulate - probe, cyclone, and filter
C_{ax}	lbs/hr	kg/hr	Particulate - total
C_p			Pitot Tube Calibration Factor
D_n	in.	m	Sampling Nozzle Diameter
%EA			Percent Excess Air at sampling point
g	32.174 ft/sec^2		Acceleration of Gravity
%I			Percent Isokinetic
%M			Percent Moisture in the stack gas by volume
M_d			Mole fraction of dry gas

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

Symbol	English Units	Metric Units	Description
m_f	mg	mg	Particulate - probe, cyclone, and filter
M_{water}	18 lb/lb-mole		Molecular Weight of water
m_t	mg	mg	Particulate - total
MW	lb/lb-mole	g/g-mole	Molecular Weight of stack gas
MW_{air}	28.96 lb/ lb-mole		Molecular Weight of air
MW_d	lb/lb-mole	g/g-mole	Molecular Weight of dry stack gas
P_b	"Hg Absolute	mm Hg	Barometric Pressure
P_m	"H_2O	mm H_2O	Orifice Pressure drop
P_s	"Hg Absolute	mm Hg	Stack Pressure
ΔP	"H_2O	mm H_2O	Velocity Head of stack gas
P_{std}	29.92 "Hg	760 mm Hg	Standard Barometric Pressure
Q_a	ACFM	m^3/hr	Stack Gas Volume at actual stack conditions
Q_s	DSCFM*	dscm/hr*	Stack Gas Volume at 29.92 "Hg, 528°R, dry
R	21.83 "Hg-ft^3/lb-mole°R		Universal Gas Constant
T_m	°F	°C	Average Gas Meter Temperature

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

Symbol	English Units	Metric Units	Description
T_t	min	min	Net time of test
T_s	°F	°C	Stack Temperature
T_{std}	528°R	293°K	Standard Temperature
V_m	ft^3	m^3	Volume of dry gas sampled @ meter conditions
Vm_{std}	dscf*	dscm*	Volume of dry gas sampled @ standard conditions
V_s	fpm	m/sec	Stack velocity @ stack conditions
V_w	ml	ml	Total water collected in impingers and silica gel
Vw_{gas}	scf*	scm*	Volume of water vapor collected @ standard conditions
ρ_{air}	0.0752 lbs/ft^3		Density of Air
ρ_{water}	1 g/ml		Density of Water
ρ_{man}	62.32 lbs/ft^3		Density of Manometer Oil

Standard Conditions: 29.92 "Hg, 68°F (760 mm Hg, 20°C)

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

EXAMPLE CALCULATIONS

1. Volume of dry gas sampled at standard conditions.*

$$Vm_{std} = Vm \left(\frac{T_{std}}{T_m + 460} \right) \left[\frac{P_b + \frac{P_m}{13.6}}{P_{std}} \right]$$

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460} \right] = dscf$$

$$Vm_{std} = dscf \times 0.028317 = dscm$$

2. Volume of water vapor collected at standard conditions.*

$$Vw_{gas} = \frac{(V_w - gms\ SO_2 - gms\ H_2S)\ \rho_{water}\ R\ T_{std}}{P_{std}\ M_{water}\ 453.6}$$

$$Vw_{gas} = 0.0472\ (V_w - gms\ SO_2 - gms\ H_2S) = scf$$

$$Vw_{gas} = scf \times 0.028317 = scm$$

3. Percent moisture in stack gas.

$$\%M = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \%$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

4. Mole fraction of dry gas.

$$M_d = \frac{100 - \%M}{100}$$

5. Average molecular weight of dry stack gas.

$$MW_d = \left[\%CO_2 \times \frac{44}{100}\right] + \left[\%O_2 \times \frac{32}{100}\right] + \left[\%N_2 \times \frac{28}{100}\right] + \left[\%CO \times \frac{28}{100}\right] = lb/lb\text{-}mole$$

$$= g/g\text{-}mole$$

6. Molecular weight of stack gas.

$$MW = MW_d \times M_d + 18\ (1 - M_d) = \frac{lb}{lb\text{-}mole} = g/g\text{-}mole$$

7. Percent excess air at sampling point.

$$\%EA = \frac{100\ [\%O_2 - (0.5\ \%CO)]}{0.265\ (\%N_2) - [\%O_2 - (0.5\ \%CO)]}$$

8. Stack Pressure.

$$P_s = P_b + \frac{Stack\ Pressure\ "H_2O}{13.6} = "Hg\ Absolute$$

$$P_s = "Hg\ Abs. \times 25.4 = mm\ Hg$$

9. Stack velocity at stack conditions.

$$V_s = C_p\ 60 \left[\frac{2g \times \rho_{man} \times P_{std} \times MW_{air} \times (T_s + 460) \times \Delta P_s}{12 \times \rho_{air} \times P_s \times MW \times T_{std}} \right]^{1/2}$$

$$V_s = 5{,}123.8\ C_p \left[\frac{(T_s + 460)}{P_s \times MW} \right]^{1/2} \sqrt{\Delta P}\ average = fpm$$

$$V_s = fpm \times 0.00508 = m/\text{sec}$$

10. Dry stack gas volume at standard conditions.*

$$Q_s = \frac{1}{144}\ V_s \times A_s \times M_d \times \frac{T_{std}}{T_s + 460} \times \frac{P_s}{P_{std}}$$

$$Q_s = \frac{0.123\ V_s \times A_s \times M_d \times P_s}{T_s + 460} = DSCFM$$

$$Q_s = DSCFM \times 1.6990 = dscm/hr$$

11. Actual stack gas volume at stack conditions.

$$Q_a = \frac{V_s \times A_s}{144} = ACFM$$

$$Q_a = ACFM \times 1.6990 = m^3/hr$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

12. Percent isokinetic.

$$\%I = \frac{Vm_{std} \times (T_s + 460) \times P_{std} \times 100 \times 144\ in^2/ft^2}{M_d \times T_{std} \times P_s \times T_t \times V_s \left(\frac{\pi \times D_n^2}{4}\right)}$$

$$\%I = \frac{1039 \times Vm_{std} \times (T_s + 460)}{M_d \times P_s \times T_t \times V_s \times D_n^2}$$

13. Particulate - probe, cyclone, and filter.

$$C_{an} = \frac{m_f}{Vm_{std}} \times \frac{1\ gr}{64.8\ mg}$$

$$C_{an} = 0.0154 \times \frac{m_f}{Vm_{std}} = gr/dscf*$$

$$C_{an} = gr/dscf \times 2.290 = g/dscm*$$

14. Particulate total.

$$C_{ao} = 0.0154 \times \frac{m_t}{Vm_{std}} = gr/dscf*$$

$$C_{ao} = gr/dscf \times 2.290 = g/dscm*$$

* 29.92 "Hg, 68°F (760 mm Hg, 20°C)

15. Particulate - probe, cyclone, and filter at stack conditions.

$$C_{at} = C_{an} \times \frac{P_s}{P_{std}} \times \frac{(T_{std})}{(T_s + 460)} \times M_d$$

$$C_{at} = \frac{17.65 \times C_{an} \times P_s \times M_d}{T_s + 460} = gr/CF$$

$$C_{at} = gr/CF \times 2.290 = g/m^3$$

16. Particulate - total, at stack conditions.

$$C_{au} = \frac{17.65 \times C_{ao} \times P_s \times M_d}{T_s + 460} = gr/CF$$

$$C_{au} = gr/CF \times 2.290 = g/m^3$$

17. Particulate - probe, cyclone, and filter.

$$C_{aw} = C_{an} \times Q_s \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1 \text{ lb}}{7000 \text{ gr}}$$

$$C_{aw} = 0.00857 \times C_{an} \times Q_s = lbs/hr$$

$$C_{aw} = lbs/hr \times 0.4536 = kg/hr$$

18. Particulate - total.

$$C_{ax} = 0.00857 \times C_{ao} \times Q_s = lbs/hr$$

$$C_{ax} = lbs/hr \times 0.4536 = kg/hr$$

19. Mercury – ug/dscm

ug/dscm = ug ÷ (Vm_{std} x 0.028317m^3/ft^3)

20. Mercury – lbs/10^{12} Btu

lbs/10^{12} Btu = ug ÷ Vm_{std} x (2.205 x 10^{-9} lbs/ug) x F_d x [20.9 ÷ (20.9 – O_2)] x (1.0 x 10^6)

F_d = Oxygen based F factor of 9,780 dscf*/million Btu

* 29.92 "Hg, 68 °F (760 mm Hg, 20 °C)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER: 99-95MON1
JOB NAME: KCP&L
LOCATION: CLINTON, MO.
UNIT TESTED: UNI NUMBER 1 PRECIPITATOR INLET DUCT - Hg

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			01/18/00	01/19/00	01/19/00
BEGIN TIME			1315	0900	1235
END TIME			1634	1108	1443
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.50 (749)	29.01 (737)	28.99 (736)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.690 (17.5)	0.724 (18.4)	0.729 (18.5)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	55.816 (1.581)	59.665 (1.690)	60.605 (1.716)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	47 (8.00)	52 (11.00)	57 (14.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	57.420 (1.626)	59.778 (1.693)	60.092 (1.702)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	151.1	161.2	163.3
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	7.132 (0.202)	7.609 (0.215)	7.708 (0.218)
%M	MOISTURE IN STACK GAS BY VOLUME	%	11.05	11.29	11.37
Tt	NET TIME OF TEST	MINUTES	125	125	125

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

KCP&L
CLINTON, MO.
UNI NUMBER 1 PRECIPITATOR INLET DUCT - Hg

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.8895	0.8871	0.8863
CO2		%	14.4	15.2	15.4
O2		%	5.2	4.6	4.2
CO		%	0.0	0.0	0.0
N2		%	80.4	80.2	80.4
%EA	EXCESS AIR @ SAMPLING POINT	%	32.3	27.6	24.6
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.51 (30.51)	30.62 (30.62)	30.63 (30.63)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.13 (29.13)	29.19 (29.19)	29.20 (29.20)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	0.488 (12.4)	0.513 (13.0)	0.513 (13.0)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	312 (156)	316 (158)	323 (162)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	28.67 (728)	28.15 (715)	28.21 (717)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	2,774 (14.09)	2,873 (14.59)	2,886 (14.66)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	8,255 (5.33)	8,255 (5.33)	8,255 (5.33)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	93,043 (158,080)	93,874 (159,492)	93,571 (158,977)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	159,043 (270,214)	164,676 (279,785)	165,444 (281,089)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SOURCE EMISSION CALCULATIONS

KCP&L
CLINTON, MO.
UNI NUMBER 1 PRECIPITATOR INLET DUCT - Hg

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	125	125	125
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.234 (0.006)	0.234 (0.006)	0.234 (0.006)
%I	PERCENT ISOKINETIC	%	95.1	98.1	99.0
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION SURVEY

JOB NUMBER: 99-95MON1
JOB NAME: KCP&L
LOCATION: CLINTON, MO.
UNIT TESTED: UNIT NUMBER 1 STACK - Hg

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS			
RUN #			1	2	3
DATE			01/18/00	01/19/00	01/19/00
BEGIN TIME			1415	0900	1230
END TIME			1710	1115	1440
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.26 (743)	29.09 (739)	28.63 (727)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.770 (19.6)	0.963 (24.5)	0.936 (23.8)
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	61.475 (1.741)	68.706 (1.946)	68.296 (1.934)
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	56 (13.00)	43 (6.00)	47 (8.00)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	61.646 (1.746)	70.303 (1.991)	68.233 (1.932)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	151.8	179.2	181.8
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	7.165 (0.203)	8.458 (0.240)	8.581 (0.243)
%M	MOISTURE IN STACK GAS BY VOLUME	%	10.41	10.74	11.17
Tt	NET TIME OF TEST	MINUTES	120	120	120

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

KCP&L
CLINTON, MO.
UNIT NUMBER 1 STACK - Hg

SYMBOL	DESCRIPTION	UNITS			
Md	MOL FRACTION OF DRY GAS		0.8959	0.8926	0.8883
CO2		%	11.6	13.2	13.8
O2		%	6.8	6.6	6.0
CO		%	0.0	0.0	0.0
N2		%	81.6	80.2	80.2
%EA	EXCESS AIR @ SAMPLING POINT	%	45.9	45.0	39.3
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	30.13 (30.13)	30.38 (30.38)	30.45 (30.45)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	28.87 (28.87)	29.05 (29.05)	29.06 (29.06)
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H20)	2.183 (55.4)	2.421 (61.5)	2.346 (59.6)
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	331 (166)	334 (168)	334 (168)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg)	29.18 (741)	29.00 (737)	28.55 (725)
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	5,940 (30.18)	6,265 (31.83)	6,216 (31.58)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	16,230 (10.47)	16,230 (10.47)	16,230 (10.47)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	391,903 (665,843)	407,736 (692,743)	396,351 (673,400)
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	669,477 (1,137,441)	706,158 (1,199,762)	700,596 (1,190,313)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

METCO ENVIRONMENTAL

SOURCE EMISSION CALCULATIONS

KCP&L
CLINTON, MO.
UNIT NUMBER 1 STACK - Hg

SYMBOL	DESCRIPTION	UNITS			
Tt	NET TIME OF TEST	MINUTES	120	120	120
Dn	SAMPLING NOZZLE DIAM.	IN. (m)	0.172 (0.004)	0.172 (0.004)	0.172 (0.004)
%I	PERCENT ISOKINETIC	%	91.9	100.7	100.6
Mf	PARTICULATE - PROBE, CYCLONE AND FILTER	mg	----	----	----
Mt	PARTICULATE - TOTAL	mg	----	----	----
Can	PARTICULATE - PROBE, CYCLONE AND FILTER	gr/DSCF* (g/DSCM)	----	----	----
Cao	PARTICULATE - TOTAL	gr/DSCF* (g/DSCM)	----	----	----
Cat	PARTIC.-PROBE, CYCLONE AND FILTER @ STACK COND.	gr/CF (g/m3)	----	----	----
Cau	PARTICULATE - TOTAL @ STACK CONDITIONS	gr/CF (g/m3)	----	----	----
Caw	PARTICULATE - PROBE, CYCLONE AND FILTER	LBS/HR (Kg/HR)	----	----	----
Cax	PARTICULATE - TOTAL	LBS/HR (Kg/HR)	----	----	----

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

APPENDIX B

Field Data

METCO ENVIRONMENTAL

Job Number 99-95 MON 1
Job Name KCPL
Run Number 1
Unit 1 Precip. Inlet Duct
Date 01-18-00
Operator J Brown/Bass/Conway/Hefley
Sample Box No. Hg 1 Meter Box No. 27-2

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 40
Assumed Moisture % 13
Probe Length 8'
C Factor 10 to 4.3 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 12.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Remarks	Heated Line °F
A5	1315	297.694	0.54	0.76	0.76	8.50	331	255	254	49	47	45	Int. Orsat	260
END	1320	299.922	—	—	—	—	—	—	—	—	—	—	Standby for stack	—
A4	1415	300.0605	0.50	0.70	0.70	8.00	316	255	251	46	45	45	(0.143) ✓	262
3	1420	302.24	0.38	0.55	0.55	7.50	323	255	256	46	46	46	CST	261
2	1425	304.28	0.43	0.60	0.60	8.00	324	252	255	46	46	46		262
1	1430	306.42	0.35	0.50	0.50	7.00	291	253	253	47	46	46		262
B5	1435	308.39	0.54	0.77	0.77	9.00	337	269	256	48	46	46		261
4	1440	310.58	0.58	0.82	0.82	9.50	343	258	259	48	47	46		261
3	1445	313.05	0.52	0.73	0.73	9.00	336	254	254	48	47	46	1448: 314.492	262
2	1507	315.32	0.43	0.61	0.61	8.00	326	268	250	48	46	46	1505: 314.492	260
1	1512	317.47	0.35	0.50	0.50	7.00	300	249	251	49	47	46	stack changed	262
C5	1517	319.44	0.54	0.77	0.77	9.00	315	255	251	49	47	46	out filter	263
4	1522	321.62	0.55	0.78	0.78	9.00	337	265	251	50	47	47		263
3	1527	324.04	0.50	0.70	0.70	9.00	335	257	254	51	48	47		262
2	1532	326.37	0.45	0.63	0.63	8.50	324	264	255	52	48	47		262
1	1537	328.60	0.47	0.67	0.67	9.00	297	265	256	52	49	47		262
END	1542	330.645	—	—	—	—	—	—	—	—	—	—	Change to Port D	—
D5	1544	330.645	0.55	0.78	0.78	9.00	298	262	260	54	49	48		261

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 55.816 ✓ ft^3
Water Collected V_w 151.1 ✓ ml
Time of Test T_t 125 min.
Stack Pressure P_s -11.3 "H_2O

Pitot Tube No. M1
Baro. Press. P_b 29.50 "Hg
Probe Tip Dia. D_n ~~0.234~~ in.
% CO_2 14.4 % CO 0.0
% O_2 5.2 % N_2 80.4
Area Stack A_s ~~10530~~ 8255 in^2

Barometer No. 19-1
Total Volume of Leak Checks After Start: 0.143 ✓ ft^3
V_m = Dry Gas Meter Calibration Factor 55.3734 X 1.008

Probe Tip No. TFE 2-8

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg1

			Water Weight Gain		
Impinger 1	Final Weight	777.4	Imp 8 938.5	Impinger 1	102.2 ✓
	Initial Weight	675.2	926.3	Impinger 2	26.7 ✓
	Increase	102.2	12.2	Impinger 3	8.1 ✓
Impinger 2	Final Weight	775.2		Impinger 4	3.8 ✓
	Initial Weight	748.5			
	Increase	26.7		Impinger 5	0.1 ✓
Impinger 3	Final Weight	733.8	V_w =	Impinger 6	1.6 ✓
	Initial Weight	725.7	g SO_2 =	Impinger 7	-3.6 ✓
	Increase	8.1	V_w =	I 8	12.2 ✓
Impinger 4	Final Weight	658.9	Checked by Jane Doe 2001	Total	151.1 ✓ = V_w
	Initial Weight	655.1			
	Increase	3.8			

Impinger 5	Final Weight	763.0	P_b =	29.50 ✓	%CO_2 =	14.4 ✓	
	Initial Weight	762.9	V_m =	55.816 ✓	%O_2 =	5.2 ✓	
	Increase	0.1	V_w =	151.1 ✓	%CO =	0.0 ✓	
			P_m =	0.690 ✓	%N_2 =	80.4	
Impinger 6	Final Weight	757.4	Avg ΔP =	0.488 ✓	A_s =	~~1.530~~ 82.55 ✓	
	Initial Weight	755.8			D_n =	0.234 ✓	
	Increase	1.6	Avg$\sqrt{\Delta P}$ =	0.697 ✓	T_t =	125 ✓	
			C_p =	0.808			
Impinger 7	Final Weight	746.6	P_s =	-11.3 "H_2O		28.67 ✓ "Hg	
	Initial Weight	750.2	T_m =	47 °F ✓		507 ✓ °R	
	Increase	-3.6	T_s =	312 °F ✓		772 ✓ °R	

Moisture Content: %M = 11.06 M_d = 0.8895 ✓ MW_d = 30.512 ✓ MW = 29.13 ✓

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 55.816 \left[\frac{29.50 + \frac{0.690}{13.6}}{47 + 460}\right] = \frac{57.420}{0.459} \text{ sft}^3/\text{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 151.1 = 7.132 ✓ sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{7.132}{57.420 + 7.132}$ x 100 = 11.05 ✓ %

V_s = 5123.8 x 0.808 $\sqrt{\frac{772}{28.67 \times 29.13}}$ x 0.697 = 2774 ✓ fpm

ACFM: ~~202,894~~ 159,043 ✓

SCFM: ~~118,685~~ 93,043 ✓

%I = $\frac{1{,}039 \times 57.420 \times 772}{28.67 \times 0.8895 \times 2774 \times 125 \times (0.234)^2}$ = 95.1 ✓ %

%EA: 32.3 ✓

Run Number 1

Unit Inlet Duct

Date 1-18-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	P_m Pump Vacuum "Hg Guage	T_s Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	T_m Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Remarks Heated Line
D4	1549	332.84	0.55	0.78	0.78	9.00	314	257	259	54	49	47	263
3	1554	335.24	0.50	0.70	0.70	9.00	307	255	259	54	49	47	262
2	1559	337.59	0.48	0.68	0.68	9.00	300	267	258	54	50	49	261
1	1604	339.89	0.45	0.64	0.64	9.00	289	269	258	55	50	49	261
E5	1609	342.06	0.45	0.64	0.64	9.00	289	255	258	55	50	48	262
4	1614	343.86	0.55	0.78	0.78	9.50	300	252	259	55	50	49	264
3	1619	346.29	0.54	0.76	0.76	10.00	295	256	258	56	50	48	260
2	1624	348.71	0.50	0.70	0.70	10.00	292	256	256	56	50	49	263
1	1629	351.07	0.50	0.70	0.70	10.00	291	260	255	56	50	49	262
END	1634	353.210	—	—	—	—	—	—	—	—	—	—	—

METCO ENVIRONMENTAL

Job Number 99-95 Mon1
Job Name Epri
Run Number 2
Unit Unit / Inlet ESP East
Date 1-19-00
Operator Conway / Brown / Bass / Hefley
Sample Box No. Hg 3 Meter Box No. 27-2

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 52
Assumed Moisture % 10.98
Probe Length 8'
C Factor 10 → 4.4 to reference
Initial Leak @ 15 "Hg = 0.001 cfm
Final Leak @ 15 "Hg = 0.001 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
A-5	0900	386.980	0.59	0.82	0.82	8.5	347	260	250	45	48	50	258	
A-4	0905	389.43	0.57	0.81	0.81	8.5	338	258	252	46	48	52	258	
A-3	0910	391.87	0.43	0.61	0.61	7.5	337	258	252	48	50	49	255	
A-2	0915	394.07	0.42	0.60	0.60	7.5	330	255	250	52	50	49	252	
A-1	0920	396.23	0.45	0.62	0.62	7.5	320	250	251	52	51	49	254	
B5	0925	398.47	0.57	0.81	0.81	8.5	334	257	251	53	51	49	254	
B-4	0930	400.76	0.61	0.88	0.88	9.0	346	261	251	53	52	49	255	
B-3	~~0930~~ 0935	403.36	0.54	0.76	0.76	9.0	312	261	250	53	52	49	256	
B-2	0940	405.83	0.37	0.51	0.51	7.0	318	250	252	54	52	50	255	
B-1	0945	407.86	0.78	1.10	1.10	11.5	312	251	251	54	53	50	255	
C-5	0950	410.89	0.56	0.80	0.80	9.0	335	254	250	54	52	50	256	
C-4	0955	413.24	0.60	0.83	0.83	9.0	344	255	249	54	52	50	257	
C-3	1000	415.78	0.51	0.71	0.71	9.0	338	262	250	55	55	50	256	
C-2	1005	418.22	0.45	0.61	0.61	8.0	329	272	249	56	54	50	256	
C-1	1010	420.45	0.37	0.51	0.51	7.5	278	271	250	55	54	51	258	
End	1015	422.657	—	—	—	—	—	—	—	—	—	—	—	
D-5	1018	422.657	0.54	0.76	0.76	9.0	307	260	252	55	54	51	251	
D-4	1023	425.01	0.54	0.76	0.76	9.0	317	260	255	55	53	51	255	

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 59.665 ✓ ft^3
Water Collected V_w 161.2 ml
Time of Test T_t 125 min.
Stack Pressure P_s -11.7 "H_2O

Pitot Tube No. M-1
Baro. Press. P_b 29.01 "Hg
Probe Tip Dia. D_n 0.234 in.
% CO_2 15.2 % CO 0.00
% O_2 4.6 % N_2 80.2
Area Stack A_s ~~10530~~ 8255 in^2

Barometer No. 19-1
Probe Tip No. ~~8~~ TFE2-8
Total Volume of Leak Checks After Start: 0.00 ft^3
V_m = Dry Gas Meter Calibration Factor 1.008 X 59.191

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg 1

Impinger 1	Final Weight	792.7	Imp 8 Final 864.3	Impinger 1	116.4 ✓
	Initial Weight	676.3	Int. 850.8	Impinger 2	22.1 ✓
	Increase	116.4	13.5	Impinger 3	4.9 ✓
Impinger 2	Final Weight	771.6		Impinger 4	3.4 ✓
	Initial Weight	749.5		Impinger 5	-0.1 ✓
	Increase	22.1		Impinger 6	0.7 ✓
Impinger 3	Final Weight	732.3		Impinger 7	0.3 ✓
	Initial Weight	727.4		Imp 8	13.5 ✓
	Increase	4.9		Total	161.2 ✓ = V_w
Impinger 4	Final Weight	661.6			
	Initial Weight	658.2			
	Increase	3.4			
Impinger 5	Final Weight	765.1			
	Initial Weight	765.2			
	Increase	-0.1			
Impinger 6	Final Weight	754.8			
	Initial Weight	754.1			
	Increase	0.7			
Impinger 7	Final Weight	748.8			
	Initial Weight	748.5			
	Increase	0.3			

Water Weight Gain

V_w =

g SO_2 = .

V_w =

Checked by Steve Zel

P_b =	29.01 ✓	%CO_2 =	15.2 ✓	
V_m =	59.665 ✓	%O_2 =	4.6 ✓	
V_w =	161.2 ✓	%CO =	0.00 ✓	
P_m =	0.724 ✓	%N_2 =	80.2 ✓	
Avg ΔP =	0.513 ✓	A_s =	~~10530~~ 0.255 ✓	
		D_n =	0.234 ✓	
Avg$\sqrt{\Delta P}$ =	0.714 ✓	T_t =	125 ✓	
C_p =	0.808 ✓			
P_s =	-11.7 ✓ H_2O		28.15 ✓ "Hg	
T_m =	52 ✓ °F		512 ✓ °R	
T_s =	316 °F		776 ✓ °R	

Moisture Content: %M = 11.29 M_d = 0.8871 ✓ MW_d = 30.616 ✓ MW = 29.19 ✓

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 59.665 \left[\frac{29.01 + \frac{0.724}{13.6}}{52 + 460}\right] = 59.778\ \text{sft}^3 \ \cancel{0.482}\ 0.478\ \text{scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 161.2 = 7.609 ✓ sft^3

$$\%\ \text{Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{7.609}{59.778 + 7.609} \times 100 = 11.29 \checkmark\ \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{776}{28.15 \times 29.19}} \times 0.714 = 2873 \checkmark\ \text{fpm}$$

ACFM: ~~210059~~ 164,676 ✓

SCFM: ~~114,795~~ 93,874 ✓

$$\%I = \frac{1{,}039 \times 59.778 \times 776}{28.15 \times 0.8871 \times 2873 \times 125 \times (0.234)^2} = \cancel{98.2}\ 98.1 \checkmark\ \%$$

%EA: 27.6 ✓

Run Number 2

Unit Unit 1 Inlet

Date 1-14-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
D3	1028	427.47	0.50	0.71	0.71	9.0	312	270	256	56	54	52	255	
D2	1033	429.87	0.48	0.68	0.68	9.0	294	270	255	56	56	52	256	
D1	1038	432.22	0.50	0.71	0.71	9.0	292	271	252	56	56	52	258	
E5	1043	434.23	0.41	0.59	0.59	9.0	293	252	253	57	54	52	258	
E4	1048	436.45	0.52	0.74	0.74	9.0	297	254	257	58	54	52	256	
E3	1053	438.84	0.52	0.74	0.74	10.0	295	248	257	59	54	52	254	
E2	1058	441.47	0.52	0.74	0.74	10.0	281	250	260	60	54	52	259	
E1	1103	443.76	0.48	0.68	0.68	10.0	272	275	261	62	54	52	258	
End	1108	446.171	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 MONI
Job Name KCPL
Run Number 3
Unit 1 Precip. Inlet Duct East
Date 01-19-00
Operator S Brown/ Conway/ BASS/ Hefley
Sample Box No. Hg 3 Meter Box No. 27-2

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 55
Assumed Moisture % 11.20
Probe Length 8'
C Factor 10 to 4.4 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 12.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Remarks	Heated Line °F
A5	1235	453.351	0.50	0.70	0.70	8.00	333	254	251	56	55	55	Int. Desat	267
4	1240	455.69	0.56	0.80	0.80	8.50	338	254	253	57	56	54	CST	270
3	1245	458.17	0.44	0.62	0.62	7.50	333	257	252	57	55	55		270
2	1250	460.38	0.44	0.62	0.62	7.50	329	255	256	57	55	55		268
1	1255	462.61	0.44	0.62	0.62	7.50	318	254	255	58	56	55		264
B5	1300	464.85	0.54	0.76	0.76	8.50	335	256	255	60	56	55		262
4	1305	467.22	0.58	0.83	0.83	9.00	348	258	255	60	57	55		262
3	1310	469.78	0.53	0.75	0.75	9.00	345	254	256	61	57	55		262
2	1315	472.23	0.45	0.64	0.64	8.00	337	254	256	60	57	56		262
1	1320	474.50	0.42	0.60	0.60	8.00	316	254	258	60	57	56		260
C5	1325	476.70	0.54	0.76	0.76	9.00	330	256	258	58	57	56		262
4	1330	478.88	0.58	0.83	0.83	9.00	345	258	256	59	57	57		261
3	1335	481.45	0.50	0.70	0.70	9.00	343	263	260	58	58	57		262
2	1340	483.86	0.46	0.66	0.66	9.00	331	263	260	59	58	57		261
1	1345	486.20	0.44	0.62	0.62	8.50	314	267	260	57	58	56		263
END	1350	488.495	—	—	—	—	—	—	—	—	—	—	Change to Port D	—
D5	1353	488.495	0.56	0.80	0.80	9.00	310	256	261	58	58	57		260
4	1358	491.10	0.56	0.80	0.80	9.00	323	254	260	58	58	56		260

Pitot Tube Calibration Factor C_p 0.808
Volume Collected V_m 60.605 ✓ ft^3
Water Collected V_w 163.3 ml
Time of Test T_t 125 min.
Stack Pressure P_s -10.6 "H_2O

Pitot Tube No. M1
Baro. Press. P_b 28.99 "Hg
Probe Tip Dia. D_n 0.234 in.
% CO_2 15.4 % CO 0.0
% O_2 4.2 % N_2 80.4
Area Stack A_s ~~10530~~ 8255 in^2

Barometer No. 19-1
Total Volume of Leak Checks After Start: — ft^3
V_m = Dry Gas Meter Calibration Factor 60.124 X 1.008

Probe Tip No. JFE 2-8

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg 3

			Water Weight Gain		
Impinger 1	Final Weight	861.7	Imp 8 943.1	Impinger 1	113.7 ✓
	Initial Weight	748.0	926.8	Impinger 2	23.7 ✓
	Increase	113.7	16.3	Impinger 3	5.6 ✓
Impinger 2	Final Weight	771.2		Impinger 4	3.5 ✓
	Initial Weight	747.5			
	Increase	23.7		Impinger 5	0.4 ✓
Impinger 3	Final Weight	677.1	V_w =	Impinger 6	0.3 ✓
	Initial Weight	671.5	g SO_2 = -		
	Increase	5.6	V_w =	Impinger 7	-0.2 ✓
Impinger 4	Final Weight	755.5	Checked by Jane Doe 2/6	Imp 8	16.3 ✓
	Initial Weight	752.0		Total	163.3 ✓ = V_w
	Increase	3.5			

Impinger 5	Final Weight	730.8	P_b = 28.99 ✓	$\%CO_2$ = 15.4 ✓	
	Initial Weight	730.4	V_m = 60.605 ✓	$\%O_2$ = 4.2 ✓	
	Increase	0.4	V_w = 163.3 ✓	%CO = 0.0 ✓	
			P_m = 0.729 ✓	$\%N_2$ = 80.4 ✓	
Impinger 6	Final Weight	657.7	Avg ΔP = 0.513 ✓	A_s = ~~10570~~ 8255 ✓	
	Initial Weight	657.4		D_n = 0.234	
	Increase	0.3	Avg$\sqrt{\Delta P}$ = 0.715 ✓	T_t = 125 ✓	
			C_p = 0.808 ✓		
Impinger 7	Final Weight	763.5	P_s = -10.6 "H_2O	28.21 ✓ "Hg	
	Initial Weight	763.7	T_m = 57 ✓ °F	517 ✓ °R	
	Increase	-0.2	T_s = 323 ✓ °F	783 ✓ °R	

Moisture Content: %M = 11.37 ✓ M_d = 0.8863 ✓ MW_d = 30.632 ✓ MW = 29.20 ✓

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 60.605 \left[\frac{28.99 + \frac{0.729}{13.6}}{57 + 460}\right] = \frac{60.092}{0.481} \checkmark \begin{matrix} sft^3 \\ scfm \end{matrix}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 163.3 = 7.708 ✓ sft^3

$$\% \text{ Moisture} = \frac{Vw_{gas}}{Vm_{std} + Vw_{gas}} \times 100 = \frac{7.708}{7.708 + 60.092} \times 100 = 11.37 \checkmark \%$$

$$V_s = 5123.8 \times 0.808 \sqrt{\frac{783}{28.21 \times 29.20}} \times 0.715 = 2886 \checkmark \text{fpm}$$

ACFM: ~~211039~~ 165,444 ✓ 93,571

SCFM: ~~119,358~~ ✓

$$\%I = \frac{1{,}039 \times 60.092 \times 783}{28.21 \times 0.8863 \times 2886 \times 125 \times (0.234)^2} = 99.0 \checkmark \%$$

%EA: 24.6 ✓

Run Number 3
Unit Inlet Duct
Date 1-19-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Remarks Heated Line
			ΔP_s		P_m		T_s				T_m		
D3	1403	493.67	0.56	0.80	0.80	9.00	320	254	259	57	58	57	261
2	1408	496.20	0.50	0.70	0.70	8.50	315	253	257	58	57	57	262
1	1413	498.65	0.50	0.70	0.70	8.50	302	254	257	56	57	57	263
E5	1418	501.00	0.55	0.79	0.79	9.00	300	256	257	56	58	58	262
4	1423	503.17	0.56	0.80	0.80	9.00	304	255	255	57	58	58	260
3	1428	505.76	0.56	0.80	0.80	9.00	300	252	255	57	58	58	261
2	1433	508.42	0.58	0.83	0.83	10.00	300	253	254	58	58	58	262
1	1438	510.94	0.48	0.69	0.69	9.00	295	255	254	58	58	58	264
END	1443	513.475	—	—	—	—	—	—	—	—	—	—	—

METCO ENVIRONMENTAL

Job Number 99-95 MON 1
Job Name EPRI
Run Number 1
Unit Unit 1 Stack
Date 1-18-00
Operator Hart/Lee/Hefley
Sample Box No. Hg-2 Meter Box No. 29-1

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 34
Assumed Moisture % 15%
Probe Length 10'
C Factor 1.0 ⇒ 2.85 to reference
Initial Leak @ 15.0 "Hg = 0.000 cfm
Final Leak @ 16.0 "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired	Orifice ΔH "H_2O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Heated Line	Remarks
D 3	1415	884.003	2.20	0.78	0.78	5.5	323	273	286	44	45	46	4th	Multi-Point
3	1420	886.56	2.15	0.76	0.76	5.5	338	277	288	43	46	47	3rd	Dark Orsat
2	1425	889.05	2.00	0.71	0.71	5.5	337	291	273	43	46	48	312	0.232 ✓
2	1430	891.49	2.05	0.72	0.72	5.5	340	301	275	43	48	50	316	Δ to thimble + filter
1	1435	893.89	1.90	0.67	0.67	5.5	336	303	277	43	48	50	314	pump off 1437 @ 894.696
1	1508	896.71	2.00	0.71	0.71	7.0	326	281	290	44	58	62	309	leak ✓ to 894.928
End	1513	899.158	—	—	—	—	—	—	—	—	—	—	—	pump on 1503 @ 894.928
C 3	1519	899.372	2.40	0.84	0.84	7.0	323	295	274	44	60	64	305	leak ✓ to 899.245, 10.0 0.000
3	1524	902.03	2.35	0.83	0.83	7.0	329	303	272	46	60	64	306	leak ✓ to 899.372, 10.0 0.000
2	1529	904.68	2.20	0.78	0.78	6.5	327	305	276	46	63	66	308	0.214 ✓
2	1534	907.30	2.20	0.78	0.78	6.5	341	292	280	48	64	66	311	
1	1539	909.87	2.05	0.72	0.72	6.5	328	283	287	50	64	66	301	
1	1544	912.42	2.10	0.74	0.74	6.0	328	280	298	50	65	67	293	
End	1549	914.867	—	—	—	—	—	—	—	—	—	—	—	leak ✓ to 914.979, 10.0 0.000
B 3	1604	915.127	2.40	0.84	0.84	7.0	331	296	301	55	64	66	281	leak ✓ to 915.127, 10.0 0.000
3	1609	917.93	2.40	0.84	0.84	7.0	332	293	299	56	62	63	283	0.260 ✓
2	1614	920.53	2.30	0.81	0.81	7.0	332	300	305	57	60	59	297	
2	1619	923.19	2.25	0.80	0.80	6.5	331	304	303	53	59	57	296	

Pitot Tube Calibration Factor C_p 0.810
Volume Collected V_m 61.475 ft^3
Water Collected V_w 151.8 ml
Time of Test T_t 120 min.
Stack Pressure P_s -1.10 "H_2O

Pitot Tube No. M-2
Baro. Press. P_b 29.26 "Hg
Probe Tip Dia. D_n 0.172 in.
% CO_2 11.6 % CO 0
% O_2 6.8 % N_2 81.6
Area Stack A_s 16.230 in^2

Barometer No. 19-1 ✓
Probe Tip No. TFE-II-6a ✓
Total Volume of Leak Checks After Start: 0.929 ✓ ft^3
V_m = Dry Gas Meter Calibration Factor 1.000 ✓ X 61.475 ✓

[Dry Gas Meter Reading — ft^3 - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg2

Impinger 1	Final Weight	827.6 ~~970.5~~	
	Initial Weight	746.9	
	Increase	80.7	
Impinger 2	Final Weight	786.8	
	Initial Weight	742.0	
	Increase	44.8	
Impinger 3	Final Weight	682.0	
	Initial Weight	672.2	
	Increase	9.8	
Impinger 4	Final Weight	754.9	
	Initial Weight	750.5	
	Increase	4.4	
Impinger 5	Final Weight	656.9	
	Initial Weight	656.4	
	Increase	0.5	
Impinger 6	Final Weight	661.7	
	Initial Weight	661.7	
	Increase	0	
Impinger 7	Final Weight	659.3	
	Initial Weight	659.9	
	Increase	-0.6	

Water Weight Gain

Imp 8
Final 869.8
Int. 857.6
12.2

V_w =
g SO_2 = -
V_w =

Impinger 1	80.7
Impinger 2	44.8
Impinger 3	9.8
Impinger 4	4.4
Impinger 5	0.5
Impinger 6	0
Impinger 7	-0.6
Imp 8	12.2
Total	151.8 = V_w

P_b =	29.26	%CO_2 =	11.6
V_m =	61.475	%O_2 =	6.8
V_w =	151.8	%CO =	0
P_m =	0.770	%N_2 =	81.6
Avg ΔP =	2.183	A_s =	16.230
		D_n =	0.172
Avg$\sqrt{\Delta P}$ =	1.477	T_t =	120
C_p =	0.810		
P_s =	-1.10 "H_2O		29.18 "Hg
T_m =	56 °F		516 °R
T_s =	331 °F		791 °R

Moisture Content: %M = 10.41 M_d = 0.8959 MW_d = 30.128 MW = 28.87

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 61.475 \left[\frac{29.26 + \frac{0.770}{13.6}}{56 + 460}\right] = \frac{61.646\ sft^3}{0.514\ scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 151.8 = 7.165 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{7.165}{61.646 + 7.165}$ x 100 = 10.41 %

V_s = 5123.8 x 0.810 $\sqrt{\frac{791}{29.18 \times 28.87}}$ x SC 1.477 = 5940 fpm

ACFM: 669.477

SCFM: 391.903

%I = $\frac{1{,}039 \times 61.646 \times 791}{120 \times 0.8959 \times 29.18 \times 5940 \times (0.172)^2}$ = 91.9 %

%EA: 45.9

Run Number 1

Unit Unit 1 Stack

Date 1-18-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	ΔP_s "Pitot" "H_2O	Orifice ΔH "H_2O Desired	P_m Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	T_s Stack Temp °F	Probe Temp °F	Oven Temp °F	Effluent Temp °F	T_m Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet	Heated Line	Remarks
B1	1624	925.84	2.10	0.74	0.74	6.5	331	305	299	52	57	56	296	
1	1629	928.38	2.05	0.72	0.72	6.0	331	301	303	52	56	54	297	
End	1634	930.840	—	—	—	—	—	—	—	—	—	—	—	leak ✓ to 930.963; 12.0 [illegible]
A3	1640	931.063	2.40	0.84	0.84	6.0	330	287	292	55	54	52	290	leak ✓ to 931.063, 11.0 [illegible]
3	1645	933.67	2.40	0.84	0.84	6.0	333	279	290	51	53	51	290	0.223 ✓
2	1650	936.41	2.30	0.81	0.81	6.0	332	284	289	50	52	52	296	
2	1655	938.90	2.20	0.78	0.78	6.0	332	291	295	50	52	52	294	
1	1700	941.46	2.00	0.71	0.71	6.0	331	292	298	49	52	52	295	
1	1705	943.92	2.00	0.71	0.71	6.0	332	294	301	49	52	51	298	
End	1710	946.407	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number 99-95 MON 1
Job Name Eprt
Run Number 2
Unit Unit 1 Stack
Date 1-19-00
Operator Hart / Lee / Hesley
Sample Box No. Hg 4 Meter Box No. 29-1

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 35
Assumed Moisture % 11
Probe Length 10'
C Factor 1.07 → 2.55 to reference
Initial Leak @ 15.0" "Hg = 0.000 cfm
Final Leak @ 15.0" "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual	Pump Vacuum "Hg Guage (P_m)	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
A3	0900	952.356	2.70	1.05	1.05	8.0	334	261	261	38	40	40	298	multi point
3	0905	955.24	2.70	1.05	1.05	8.0	337	263	264	39	40	41	297	Inst Offset
2	0910	958.10	2.40	0.96	0.96	7.0	342	266	266	39	41	42	296	
2	0915	960.86	2.40	0.96	0.96	7.0	342	268	267	39	41	42	296	
1	0920	963.62	2.20	0.88	0.88	6.5	333	268	267	39	41	42	294	
1	0925	966.27	2.20	0.88	0.88	6.5	333	267	267	40	42	43	294	
End	0930	968.822	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 10" 0.000 968.935
B3	0936	968.935	2.50	0.99	0.99	6.5	324	265	266	39	42	43	294	0.113
3	0941	971.71	2.50	0.99	0.99	6.5	330	265	266	39	42	43	294	
2	0946	974.52	2.45	0.98	0.98	6.5	335	265	270	37	42	43	297	
2	0951	977.30	2.45	0.98	0.98	6.5	336	266	271	37	42	43	297	
1	0956	980.05	~~2.45~~ 2.20	0.88	0.88	6.5	335	264	273	37	43	44	299	
1	1001	982.84	2.20	0.88	0.88	6.5	336	265	273	37	43	44	299	
End	1006	985.499	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 10" 0.000 985.589
C3	1011	985.589	2.50	0.99	0.99	6.5	330	260	275	40	44	45	298	0.090
3	1016	988.43	2.50	0.99	0.99	6.5	333	261	276	40	44	46	298	
2	1021	991.65	2.40	0.96	0.96	6.5	334	262	278	43	44	45	298	
2	1026	994.47	2.40	0.96	0.96	6.5	333	263	279	45	44	45	297	

Pitot Tube Calibration Factor C_p 0.810
Volume Collected V_m 68.706 ft³
Water Collected V_w 179.2 ml
Time of Test T_t 120 min.
Stack Pressure P_s −1.20 "H₂O

Pitot Tube No. M-2
Baro. Press. P_b 29.09 "Hg
Probe Tip Dia. D_n 0.172 in.
% CO_2 13.2 % CO 0.0
% O_2 6.6 % N_2 80.2
Area Stack A_s 16230 in²

Barometer No. 19-1 ✓
Probe Tip No. TFE II-6A ✓
Total Volume of Leak Checks After Start: ~~0.433~~ 0.430 ft³
V_m = Dry Gas Meter Calibration Factor 1.000 X ~~68.706~~ ~~67.703~~ 68.706

[Dry Gas Meter Reading — ft³ - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg 4

Impinger 1	Final Weight	832.9	
	Initial Weight	753.8	
	Increase	79.1	
Impinger 2	Final Weight	823.2	
	Initial Weight	746.8	
	Increase	76.4	
Impinger 3	Final Weight	762.8	
	Initial Weight	756.7	
	Increase	6.1	
Impinger 4	Final Weight	763.8	
	Initial Weight	760.0	
	Increase	3.8	
Impinger 5	Final Weight	753.1	
	Initial Weight	752.4	
	Increase	0.7	
Impinger 6	Final Weight	655.9	
	Initial Weight	655.8	
	Increase	0.1	
Impinger 7	Final Weight	665.4	
	Initial Weight	665.2	
	Increase	0.2	

Water Weight Gain

Imp. 8 995.3 / 982.5 / 12.8

V_w =

g SO_2 = .

V_w =

Checked by Shane Lee 261

Impinger 1	79.1
Impinger 2	76.4
Impinger 3	6.1
Impinger 4	3.8
Impinger 5	0.7
Impinger 6	0.1
Impinger 7	0.2
Imp 8	12.8
Total	179.2 = V_w

P_b =	29.09		%CO_2 =	13.2
V_m =	~~67.703~~ 68.706		%O_2 =	6.6
V_w =	179.2		%CO =	0.0
P_m =	0.963		%N_2 =	80.2
Avg ΔP =	~~2.412~~ ~~2.392~~ 2.421		A_s =	16230
Avg$\sqrt{\Delta P}$ =	~~1.56~~ ~~1.548~~ 1.555		D_n =	0.172
C_p =	0.810		T_t =	120
P_s =	-1.20	'H$_2$O	29.00	'Hg
T_m =	~~43.39~~ 43	°F	503	°R
T_s =	334	°F	794	°R

Moisture Content: %M = ~~10.88~~ 10.74 M_d = ~~0.8912~~ 0.8926 MW_d = 30.376 MW = ~~29.03~~ 29.05

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times \cancel{67.703}\ 68.706 \left[\frac{29.09 + \frac{0.963}{13.6}}{43 + 460}\right] = \cancel{69.276}\ 70.303\ sft^3 = \cancel{6.577}\ 0.586\ scfm$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 179.2 = 8.458 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{8.458}{69.276 + 8.458}$ x 100 = ~~10.88~~ 10.74 %

V_s = 5123.8 x 0.810 $\sqrt{\frac{794}{\cancel{29.03}\ 29.05 \times 29.00}}$ x ~~1.548~~ 1.555 = ~~6239~~ 6265 fpm

%I = $\frac{1,039 \times \cancel{69.276}\ 70.303 \times 794}{120 \times 29.00 \times \cancel{0.8912}\ 0.8926 \times \cancel{6239}\ 6265 \times (0.172)^2}$ = ~~99.8~~ 100.7 %

ACFM: ~~703,221~~ 706,158

SCFM: ~~405,407~~ 407,736

%EA: 45.0

Run Number 2

Unit Unit 1 Stack

Date 1-19-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired (P_m)	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
C1	1031	997.38	2.40	0.96	0.96	6.5	333	269	279	44	44	45	298	
1	1036	1000.23	2.40	0.96	0.96	6.5	333	268	278	44	44	45	298	
End	1041	1003.003	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 10" 0.000 1003.230
D3	1045	1003.230	2.50	0.99	0.99	7.0	333	267	278	44	44	45	297	~~0.230~~
3	1050	1006.39	2.50	0.99	0.99	7.0	334	267	278	44	44	45	298	0.227
2	1055	1009.52	2.40	0.96	0.96	6.5	334	267	278	44	44	45	298	
2	~~10~~1100	1012.66	2.40	0.96	0.96	6.5	334	267	278	44	44	45	298	
1	1105	1015.89	2.40	0.96	0.96	6.5	334	267	278	44	44	45	299	
1	1110	1018.70	2.40	0.96	0.96	6.5	334	266	279	42	44	45	298	
End	1115	1021.492	—	—	—	—	—	—	—	—	—	—	—	

METCO ENVIRONMENTAL

Job Number: 99-95 mon i
Job Name: Epri
Run Number: 3
Unit: Unit 1 Stack
Date: 1-19-00
Operator: Hart / Lee / Hesky
Sample Box No. Hg-3 Meter Box No. 29-1

Hg Field Data

Read and record at the start of each test point.

Purge to: —
Purge time: —
Pitot Leak Check Initial ✓ Final ✓

Ambient Temp. °F 45
Assumed Moisture % 11
Probe Length 10'
C Factor 1.0 → 2.55 to reference
Initial Leak @ 15.0" "Hg = 0.000 cfm
Final Leak @ 15.0" "Hg = 0.000 cfm

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H₂O (ΔP_s)	Orifice ΔH "H₂O Desired	Orifice ΔH "H₂O Actual (P_m)	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet	Dry Gas Temp. °F Outlet (T_m)	Heated Line	Remarks
D3	1230	22.806	2.50	0.99	0.99	8.0	333	270	280	44	46	47	300	
3	1235	25.64	2.50	0.99	0.99	7.0	333	270	281	50	46	47	298	
2	1240	28.48	2.40	0.96	0.96	7.0	332	271	280	51	46	48	298	
2	1245	31.31	2.40	0.96	0.96	7.0	332	271	280	49	47	48	298	
1	1250	34.15	2.00	0.80	0.80	7.0	330	271	281	48	47	48	299	
1	1255	36.77	2.00	0.80	0.80	7.0	330	271	281	46	47	48	299	
End	1300	39.331	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 10" 0.000 39.441
C3	1304	39.441	2.50	0.99	0.99	7.0	330	271	280	47	47	48	298	0.110
3	1309	42.40	2.50	0.99	0.99	7.0	331	271	280	47	47	48	299	
2	1314	45.39	2.40	0.96	0.96	7.0	331	271	280	47	47	48	299	
2	1319	48.21	2.40	0.96	0.96	7.0	334	272	279	46	47	48	299	
1	1324	51.10	2.40	0.96	0.96	7.0	334	272	279	46	47	48	299	
1	1329	53.90	2.40	0.96	0.96	7.0	336	272	279	46	47	48	298	
End	1334	56.651	—	—	—	—	—	—	—	—	—	—	—	Leak ✓ @ 10" 0.000 56.709
B3	1337	56.709	2.40	0.96	0.96	7.0	336	272	279	46	47	48	299	0.058
3	1342	59.48	2.40	0.96	0.96	7.0	336	272	279	46	47	48	299	
2	1347	62.28	2.35	0.94	0.94	7.0	336	272	279	46	48	49	299	
2	1352	65.14	2.35	0.94	0.94	7.0	336	272	299	46	48	49	298	

Pitot Tube Calibration Factor C_p 0.810
Volume Collected V_m 68.296 ft³
Water Collected V_w 181.8 ml
Time of Test T_t 120 min.
Stack Pressure P_s −1.10 "H₂O

Pitot Tube No. M-2
Baro. Press. P_b 28.63 "Hg
Probe Tip Dia. D_n 0.172 in.
% CO_2 13.8 % CO 0.0
% O_2 6.0 % N_2 80.2
Area Stack A_s 16330 in²

Barometer No. 19-1 ✓
Probe Tip No. TFE II-6A ✓
Total Volume of Leak Checks After Start: ~~[illegible]~~ ft³ 0.197 ✓
V_m = Dry Gas Meter Calibration Factor 1.000 ✓ X 68.296 ✓

[Dry Gas Meter Reading — ft³ - (T_t — min. X Leak Rate — cfm)]

Impinger Box No. Hg2

Impinger 1	Final Weight	824.5
	Initial Weight	750.4
	Increase	74.1
Impinger 2	Final Weight	747.5
	Initial Weight	670.6
	Increase	76.9
Impinger 3	Final Weight	757.4
	Initial Weight	742.4
	Increase	15.0
Impinger 4	Final Weight	757.6
	Initial Weight	754.4
	Increase	3.2
Impinger 5	Final Weight	658.8
	Initial Weight	658.6
	Increase	0.2
Impinger 6	Final Weight	672.0
	Initial Weight	671.5
	Increase	0.5
Impinger 7	Final Weight	660.8
	Initial Weight	661.0
	Increase	-0.2

Water Weight Gain

Imp 8
Final 882.0
Int. 869.9
12.1

V_w =
g SO_2 = -
V_w =

Checked by Shane Lee 261

Impinger 1	74.1
Impinger 2	76.9
Impinger 3	15.0
Impinger 4	3.2
Impinger 5	0.2
Impinger 6	0.5
Impinger 7	-0.2
Imp 8	12.1
Total	~~181.8~~ = V_w

P_b =	28.63	%CO_2 =	13.8
V_m =	68.296	%O_2 =	6.0
V_w =	181.8	%CO =	0.0
P_m =	0.936	%N_2 =	80.2
Avg ΔP =	~~2.342~~ 2.346	A_s =	16.230
Avg$\sqrt{\Delta P}$ =	~~1.497~~ 1.531	D_n =	0.172
C_p =	0.810	T_t =	120
P_s =	-1.10 "H_2O		28.55 "Hg
T_m =	47 °F		507 °R
T_s =	334 °F		794 °R

Moisture Content: %M = 11.17 M_d = 0.8883 MW_d = 30.448 MW = 29.06

$$Vm_{std} = 17.65\ Vm \left[\frac{P_b + \frac{P_m}{13.6}}{T_m + 460}\right] = 17.65 \times 68.296 \left[\frac{28.63 + \frac{0.936}{13.6}}{47 + 460}\right] = \frac{68.233\ sft^3}{0.569\ scfm}$$

Vw_{gas} = 0.0472 x Vw = 0.0472 x 181.8 = 8.581 sft^3

% Moisture = $\frac{Vw_{gas}}{Vm_{std} + Vw_{gas}}$ x 100 = $\frac{8.581}{8.581 + 68.233}$ x 100 = 11.17 %

V_s = 5123.8 x 0.810 $\sqrt{\frac{794}{28.55 \times 29.06}}$ x $\frac{1.497}{1.531}$ = ~~6078~~ 6216 fpm

ACFM: ~~685038~~ 700,596

SCFM: ~~387552~~ 396,351

%I = $\frac{1,039 \times 68.233 \times 794}{28.55 \times 0.8883 \times \cancel{6078}\ 6216 \times 120 \times (0.172)^2}$ = ~~90.8~~ 100.6 %

%EA: 39.3

Run Number 3

Unit ~~1-19-00~~ unit 1 Stack

Date 1-19-00

Hg FIELD DATA

Point	Clock Time	Dry Gas Meter, CF	"Pitot" "H_2O (ΔP_s)	Orifice ΔH "H_2O Desired (P_m)	Orifice ΔH "H_2O Actual	Pump Vacuum "Hg Guage	Stack Temp °F (T_s)	Probe Temp °F	Oven Temp °F	Effluent Temp °F	Dry Gas Temp. °F Inlet (T_m)	Dry Gas Temp. °F Outlet	Heated Line	Remarks
B1	1357	68.09	2.35	0.94	0.94	7.0	335	272	278	44	46	48	299	
1	1402	71.00	2.35	0.94	0.94	7.0	335	272	278	44	46	48	299	
End	1407	73.842	—	—	—	—	—	—	—	—	—	—	—	Leak Ck @ 18" 0.000 73.871
A3	1410	73.871	2.40	0.96	0.96	7.0	335	272	278	45	46	48	299	0.029
3	1415	76.73	2.40	0.96	0.96	7.0	336	270	277	45	46	46	301	
2	1420	79.61	2.35	0.94	0.94	7.0	336	270	277	45	46	46	300	
2	1425	82.48	2.35	0.94	0.94	7.0	335	270	276	45	46	46	300	
1	1430	85.35	2.10	0.83	0.83	7.0	335	270	276	45	46	46	299	
1	1435	88.19	2.10	0.83	0.83	7.0	335	270	276	45	46	46	299	
End	1440	91.299	—	—	—	—	—	—	—	—	—	—	—	

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-95MONI

Job Name KCPL

Sampling Location Unit 1 Precipitator East Inlet Duct

Date 1-18-00 Time 1100

Stack Height 20 ft.

Sampling Port Height Above Ground 13 ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)	77				77
Port & Wall Thickness (in.)	12"				12
Inside Stack Diameter (in.)	65				65

65" X 127" De = 86

Sampling Ports are 4 ft. 6.5 in. ~~1.21~~ 0.91 stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 10 ft. 3.5 in. ~~1.40~~ 1.44 stack diameters) upstream from disturbance (outlet, constriction, bend, expansion)

Point Number	Percent Diameter	Distance from Ref. Point (decimal in.)	Distance from Ref. Point (fractional in.)	Port A ΔP/T_s/α	Port B ΔP/T_s/α	Port C ΔP/T_s/α	Port D ΔP/T_s/α
1		6.5	6 1/2	/ /	0.371336-5	0.391318-2	0.408261-3
2		19.5	19 1/2	0.151323	0.341241-14	0.361331-8	0.341341-2
3		32.5	32 1/2	0.151321	0.311331-12	0.43 1341-17	0.441341-5
4		45.5	45 1/2	0.131321	0.421311-2	0.461342-5	0.461336-10
5		58.5	58 1/2	0.111321	0.441330-10	0.51 1339-15	0.331321 3
6				/ /	/ /	/ /	/ /
7				Port D	Port E	/ /	/ /
8				0.661271-8	0.421285-6	/ /	/ /
9				0.651305-10	0.501281-8	/ /	/ /
10				0.561307-13	0.531289-7	/ /	/ /
11				0.531308-10	0.531287-5	/ /	/ /
12				0.491311-12	0.521291 0	/ /	/ /
13				/ /	/ /	/ /	/ /
14				/ /	/ /	/ /	/ /
15				/ /	/ /	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M-1

C_p = 0.808

P_b = 29.52 "Hg 28.67

P_s = -11.5 "H_2O 30.37 "Hg

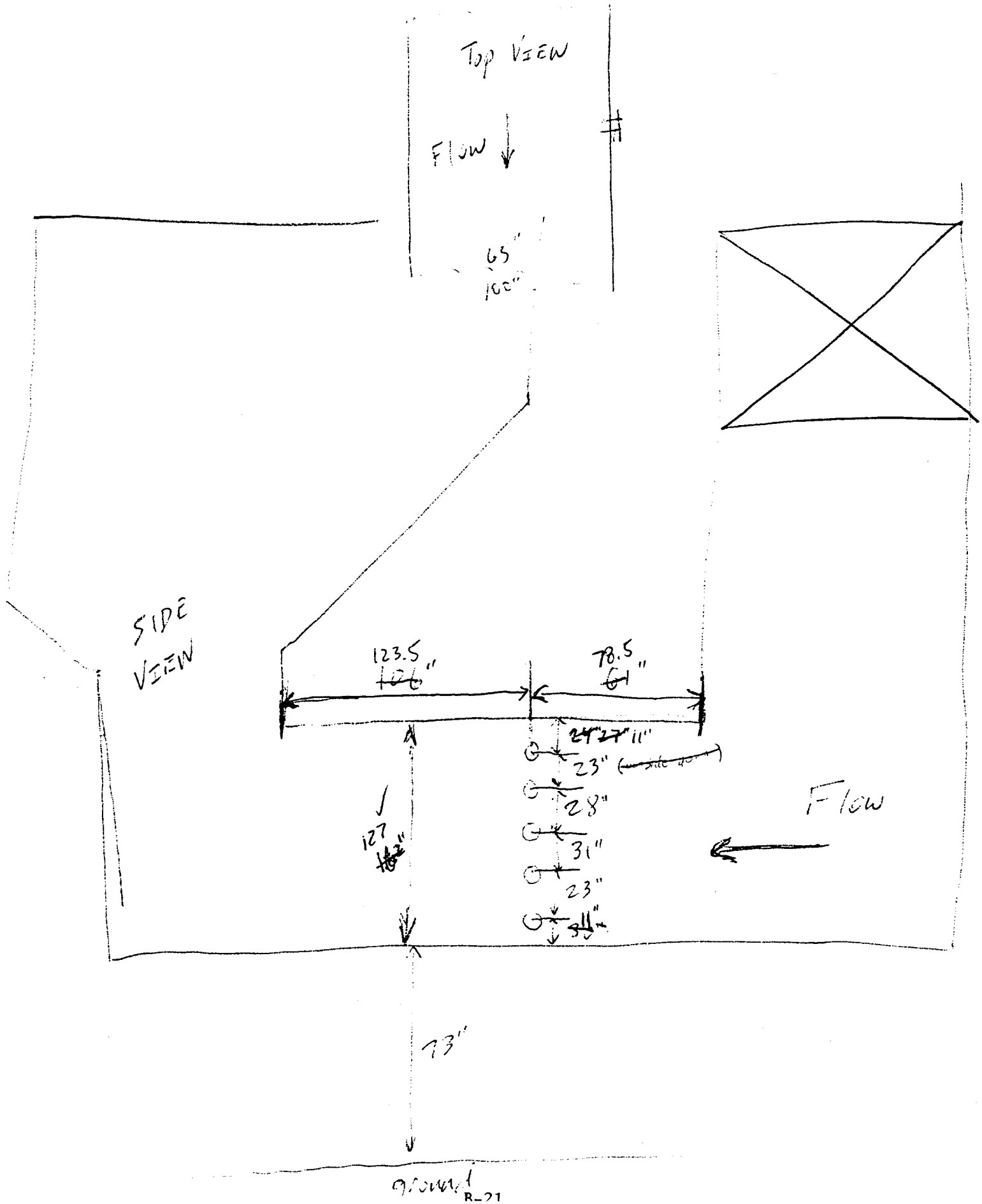
A_s = ~~10530~~ 6255 in.^{2}

Average ΔP 0.462

Average $\Delta P^{1/2}$ 0.676

Average T_s 318 °F

Average α 7.68 degrees


Top VIEW
FLOW
65"
100"
SIDE VIEW
123.5"
78.5"
11"
23"
28"
31"
23"
11"
127"
Flow
73"
Ground

PRELIMINARY VELOCITY TRAVERSE DATA
AND
SAMPLING LOCATION DATA

Job Number 99-95 MON 1
Job Name KCPL
Sampling Location Unit 1 Stack
Date 1-18-00 Time 1000

Stack Height 416 1/4" ft.
Sampling Port Height Above Ground 277 1/2" ft.

	Port A	Port B	Port C	Port D	Average
Port & Inside Diameter (in.)	198 3/4"	198 3/4"	198 1/4"	198 3/4"	198 3/4"
Port & Wall Thickness (in.)	55"	55"	54 1/2"	55"	55"
Inside Stack Diameter (in.)	143 3/4"	143 3/4"	143 3/4	143 3/4	143 3/4"

Sampling Ports are 251 ft. 3 in. (2.097 stack diameters) downstream from disturbance (inlet, constriction, bend, expansion)

Sampling Ports are 138 ft. 9 in. (11.58 stack diameters) upstream from disturbance (outlet, constriction, bend, expansion)

Point Number	Percent Diameter	Distance from Ref. Point (decimal in.)	Distance from Ref. Point (fractional in.)	Port A $\Delta P/T_s/\alpha$	Port B $\Delta P/T_s/\alpha$	Port C $\Delta P/T_s/\alpha$	Port D $\Delta P/T_s/\alpha$
1	4.4	6.325	6 5/16	1.9013181 1	1.7013141 2	1.9013070	1.8513051 -1
2	14.6	20.988	21 ~~20 5/16~~	2.2513201 2	2.3013181 -2	2.1013161 2	2.3013161 2
3	29.6	42.550	42 9/16	2.3013221 2	2.3513221 -1	2.2513201 3	2.4013211 2
4				/ /	/ /	/ /	/ /
5				/ /	/ /	/ /	/ /
6				/ /	/ /	/ /	/ /
7				/ /	/ /	/ /	/ /
8				/ /	/ /	/ /	/ /
9				/ /	/ /	/ /	/ /
10				/ /	/ /	/ /	/ /
11				/ /	/ /	/ /	/ /
12				/ /	/ /	/ /	/ /
13				/ /	/ /	/ /	/ /
14				/ /	/ /	/ /	/ /
15				/ /	/ /	/ /	/ /
16				/ /	/ /	/ /	/ /
17				/ /	/ /	/ /	/ /
18				/ /	/ /	/ /	/ /
19				/ /	/ /	/ /	/ /
20				/ /	/ /	/ /	/ /
21				/ /	/ /	/ /	/ /
22				/ /	/ /	/ /	/ /
23				/ /	/ /	/ /	/ /
24				/ /	/ /	/ /	/ /

Pitot Tube No. M-2
C_p = 0.810
(19-1) P_b = 29.26 "Hg
P_s = -1.10 "H_2O 29.18 "Hg
A_s = 16.230 in.^{2}

Average ΔP 2.133
Average $\Delta P^{1/2}$ 1.458
Average T_x 317 °F
Average α 0.83 degrees

METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-95MON1 Sample Location: Unit 1 Precipitator East Inlet

Job Name: EPRI - KCPL Analytical Method: 3B

Location: Clinton, MO Sample Type: Single point or Multi point, Grab or Integrated

Date: 1-18-00 Leak Check: Time: 4:00 (min. 4 minutes) Rate: 0:000

Operator: Hefley Ambient Air Check:

CO_2 - % Vol.	0.0
O_2 - % Vol.	20.9
N_2 - % Vol.	79.1

Run Number 1 Run Time 1315-1634	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	14.4	14.4	14.4	14.4
O_2 - % Vol.	5.2	5.2	5.2	5.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

Run Number 2 Run Time 0900-1108	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	15.2	15.2	15.2	15.2
O_2 - % Vol.	4.6	4.6	4.6	4.6
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

Run Number 1235-1443 Run Time 3	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	15.4	15.4	15.4	15.4
O_2 - % Vol.	4.2	4.2	4.2	4.2
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.4	80.4	80.4	80.4

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METCO ENVIRONMENTAL

ORSAT ANALYSIS DATA FORM

Job Number: 99-95 MONI
Sample Location: Unit 1 Stack
Job Name: EPRI - KCPL
Analytical Method: 3B
Location: Clinton, MO
Sample Type: Single point or Multi point; Grab or Integrated
Date: 1-18-00
Leak Check: Time: 4:00 (min. 4 minutes) Rate: 0:000
Operator: Hefley
Ambient Air Check:

CO_2 - % Vol.	0.0
O_2 - % Vol.	20.9
N_2 - % Vol.	79.1

Run Number 1 Run Time 1415-1710	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	11.6	11.6	11.6	11.6
O_2 - % Vol.	6.8	6.8	6.8	6.8
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	81.6	81.6	81.6	81.6

Run Number 2 Run Time 0900-1115	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.2	13.2	13.2	13.2
O_2 - % Vol.	6.6	6.6	6.6	6.6
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

Run Number 3 Run Time 1230-1445	Analysis 1	Analysis 2	Analysis 3	Average - % Vol.
CO_2 - % Vol.	13.8	13.8	13.8	13.8
O_2 - % Vol.	6.0	6.0	6.0	6.0
CO - % Vol.	0.0	0.0	0.0	0.0
N_2 - % Vol.	80.2	80.2	80.2	80.2

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APPENDIX C

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-1	0.808	11/22/99
Pitot Tube #M-2	0.810	11/22/99
Probe Tip #TFE-2-6a	0.172	11/19/99
Probe Tip #TFE-2-8	0.234	11/19/99
Dry Gas Meter #27-2	1.008	01/10/00
Stack Unit Orifice #27-2		01/14/00
Digital Temperature Indicator #27-2		01/10/00
Dry Gas Meter #29-1	1.000	11/22/99
Stack Unit Orifice #29-1		11/22/99
Digital Temperature Indicator #29-1		11/22/99
Barometer #19-1		11/22/99

APPENDIX C

Post Test

Calibration Data

Equipment	Calibration Factor	Calibration Date
Pitot Tube #M-1	0.810	01/31/00
Pitot Tube #M-2	0.810	01/31/00
Probe Tip #TFE-2-6a	0.171	01/31/00
Probe Tip #TFE-2-8	0.233	01/31/00
Dry Gas Meter #27-2	1.028	03/09/00
Stack Unit Orifice #27-2		03/09/00
Digital Temperature Indicator #27-2		03/09/00
Dry Gas Meter #29-1	0.998	02/07/00
Stack Unit Orifice #29-1		02/07/00
Digital Temperature Indicator #29-1		02/07/00
Barometer #19-1		01/31/00

PITOT TUBE CALIBRATION

Date: 11-22-99

Time: 1300

Pitot No.: m1

T_s: 68 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574 ~~0.587~~	0.808
20	40	0.34	0.34	0.583	0.51	0.714	0.808	0.51	0.714	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.50	1.225	0.808	1.50	1.225	0.808
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.808			0.808

Summary of Results:

Normal high side calibration factor 0.808

variation + 0.00%

variation - 0.00%

Normal low side calibration factor 0.808

variation + 0.00%

variation - 0.00%

Calibrator: Scott Hart #268

Checked By: Jason Conway #273

PITOT TUBE CALIBRATION

Date: 11-22-99

Time: 0830

Pitot No.: m2

T_s: 70 °F

Pitot Dimensions: 3/8" tips

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	$\sqrt{\text{Standard Average}}$	High	$\sqrt{\text{High}}$	Cal. Factor	Low	$\sqrt{\text{Low}}$	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808
20	40	0.34	0.34	0.583	0.51	0.714 ~~0.51~~	0.808	0.51	0.714	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.45	1.204	0.822	1.45	1.204	0.822
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.810			0.810

Summary of Results:

Normal high side calibration factor 0.810

variation + 1.48%

variation - 0.25%

Normal low side calibration factor 0.810

variation + 1.48%

variation - 0.25%

Calibrator: Scott Hart #268

Checked By: Jason Conway #273

NOZZLE CALIBRATION

Nozzle Set No. TFE-2

Date 11-19-99 Calibrator: Mike Bass

	4	6a	7	8	10	12
Reading 1	0.116	0.174	0.193	0.235	0.309	0.363
Reading 2	0.115	0.170	0.195	0.232	0.309	0.362
Reading 3	0.114	0.170	0.195	0.232	0.310	0.363
Reading 4	0.114	0.172	0.194	0.234	0.309	0.363
Reading 5	0.115	0.174	0.197	0.235	0.308	0.361
Reading 6	0.115	0.173	0.196	0.235	0.309	0.361
Reading 7	0.115	0.172	0.197	0.235	0.311	0.362
Reading 8	0.114	0.174	0.195	0.234	0.310	0.362
Reading 9	0.116	0.171	0.196	0.234	0.309	0.363
Reading 10	0.115	0.172	0.195	0.233	0.309	0.363
Average	0.115	0.172	0.195	0.234	0.309	0.362

	14	—	—	—	—	—
Reading 1	0.435					
Reading 2	0.433					
Reading 3	0.434					
Reading 4	0.435					
Reading 5	0.433					
Reading 6	0.434					
Reading 7	0.433					
Reading 8	0.432					
Reading 9	0.433					
Reading 10	0.432					
Average	0.433					

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 1-10-00

ΔH ("H_2O)	C_{DG}
0.5	1.003
1.0	1.002
1.5	1.014
2.0	1.015
3.0	1.011
4.0	1.005
Average	1.008

Variation: + 0.69%

- 0.60%

Calibrator: Jason Brown 274

Checked By: Jason Conway #273

C_{DG} @ 2 liters/min. = 1.059

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 01-10-00

Calibrator: JASON BROWN 274

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5 "H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1520	5.0 cf	70 °F	-0.8 "H_2O	107.484 cf	78 °F	77 °F	0.5 "H_2O
Start	1508	0.0 cf	70 °F	-0.6 "H_2O	102.449 cf	77 °F	76 °F	0.5 "H_2O
Avg.	12	5.0 cf	70 °F	-0.7 "H_2O	5.035 cf	77 °F		0.5 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.0 \left[\frac{29.25 + \frac{-0.7}{13.6}}{70 + 460}\right] \times 1.000 (C_p) = 4.862 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.035 \left[\frac{29.25 + \frac{0.5}{13.6}}{77 + 460}\right] = 4.847 \text{ dcsf}$$

$$C_{DG} = \frac{4.862}{4.847} = \boxed{1.003}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 1-10-00

Calibrator: Jason Brown

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1532	5.0 cf	70 °F	-1.4 "H_2O	112.714 cf	80 °F	78 °F	1.00 "H_2O
Start	1523	0.0 cf	70 °F	-1.3 "H_2O	107.676 cf	78 °F	77 °F	1.00 "H_2O
Avg.	9	5.0 cf	70 °F	-1.35 "H_2O	5.038 cf	78 °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.0 \left[\frac{29.25 + \frac{-1.35}{13.6}}{70 + 460}\right] \times 1.000(C_p) = 4.854 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.038 \left[\frac{29.25 + \frac{1.00}{13.6}}{78 + 460}\right] = 4.847 \text{ dcsf}$$

$$C_{DG} = \frac{4.854}{4.847} = \boxed{1.002}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 01-10-00

Calibrator: JASON BROWN

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.50

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1613	10.0 cf	70 °F	-1.80 "H_2O	135.128 cf	85 °F	80 °F	1.50 "H_2O
Start	1557	0.0 cf	70 °F	-1.80 "H_2O	125.130 cf	82 °F	79 °F	1.50 "H_2O
Avg.	16	10.0 cf	70 °F	-1.80 "H_2O	9.998 cf	82 °F		1.50 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.00 \left[\frac{29.25 + \frac{-1.80}{13.6}}{70 + 460}\right] \times 1.000\ (C_p) = 9.697 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.998 \left[\frac{29.25 + \frac{1.50}{13.6}}{82 + 460}\right] = 9.559 \text{ dcsf}$$

$$C_{DG} = \frac{9.697}{9.559} = \boxed{1.014}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 1-10-00

Calibrator: Jason Brown

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1628	10.0 cf	70 °F	-2.3 "H_2O	145.335 cf	88 °F	83 °F	2.00 "H_2O
Start	1614	0.0 cf	70 °F	-2.4 "H_2O	135.310 cf	86 °F	81 °F	2.00 "H_2O
Avg.	14	10.0 cf	70 °F	-2.35 "H_2O	10.025 cf	85 °F		2.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.0 \left[\frac{29.25 + \frac{-2.35}{13.6}}{70 + 460}\right] \times 1.000\ (C_f) = 9.683 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.025 \left[\frac{29.25 + \frac{2.00}{13.6}}{85 + 460}\right] = 9.544 \text{ dcsf}$$

$$C_{DG} = \frac{9.683}{9.544} = \boxed{1.015}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Jason Braun

Date: 1-10-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1640	10.0 cf	70 °F	-3.10 "H_2O	155.984 cf	90 °F	83 °F	3.00 "H_2O
Start	1629	0.0 cf	70 °F	-3.10 "H_2O	145.950 cf	88 °F	82 °F	3.00 "H_2O
Avg.	11	10.0 cf	70 °F	-3.10 "H_2O	10.034 cf	86 °F		3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times \cancel{29.25}\ 10.0 \left[\frac{29.25 + \frac{-3.10}{13.6}}{70 + 460}\right] \times 1.000\ (C_f) = 9.665 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.034 \left[\frac{29.25 + \frac{3.00}{13.6}}{86 + 460}\right] = 9.559 \text{ dcsf}$$

$$C_{DG} = \frac{9.665}{9.559} = \boxed{1.011}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 1-10-00

Calibrator: JASON BROWN

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.00" H_2O

P_b: 29.25 "Hg

Control Module Vacuum: 6.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1651	10.0 cf	70 °F	-4.00 "H_2O	166.410 cf	93 °F	84 °F	4.00 "H_2O
Start	1641	0.0 cf	70 °F	-4.10 "H_2O	156.330 cf	91 °F	83 °F	4.00 "H_2O
Avg.	10	10.0 cf	70 °F	-4.05 "H_2O	10.080 cf	88 °F		4.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.0 \left[\frac{29.25 + \frac{-4.05}{13.6}}{70 + 460}\right] \times 1.000 (C_p) = 9.642 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.080 \left[\frac{29.25 + \frac{4.00}{13.6}}{88 + 460}\right] = 9.592 \text{ dcsf}$$

$$C_{DG} = \frac{9.642}{9.592} = \boxed{1.005}$$

DRY GAS METER CALIBRATION

Meter Number: 27-2

Date: 1-14-00

Calibrator: Jason Conway #273

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2L/min

P_b: 30.50 "Hg

Control Module Vacuum: 0.00 "Hg

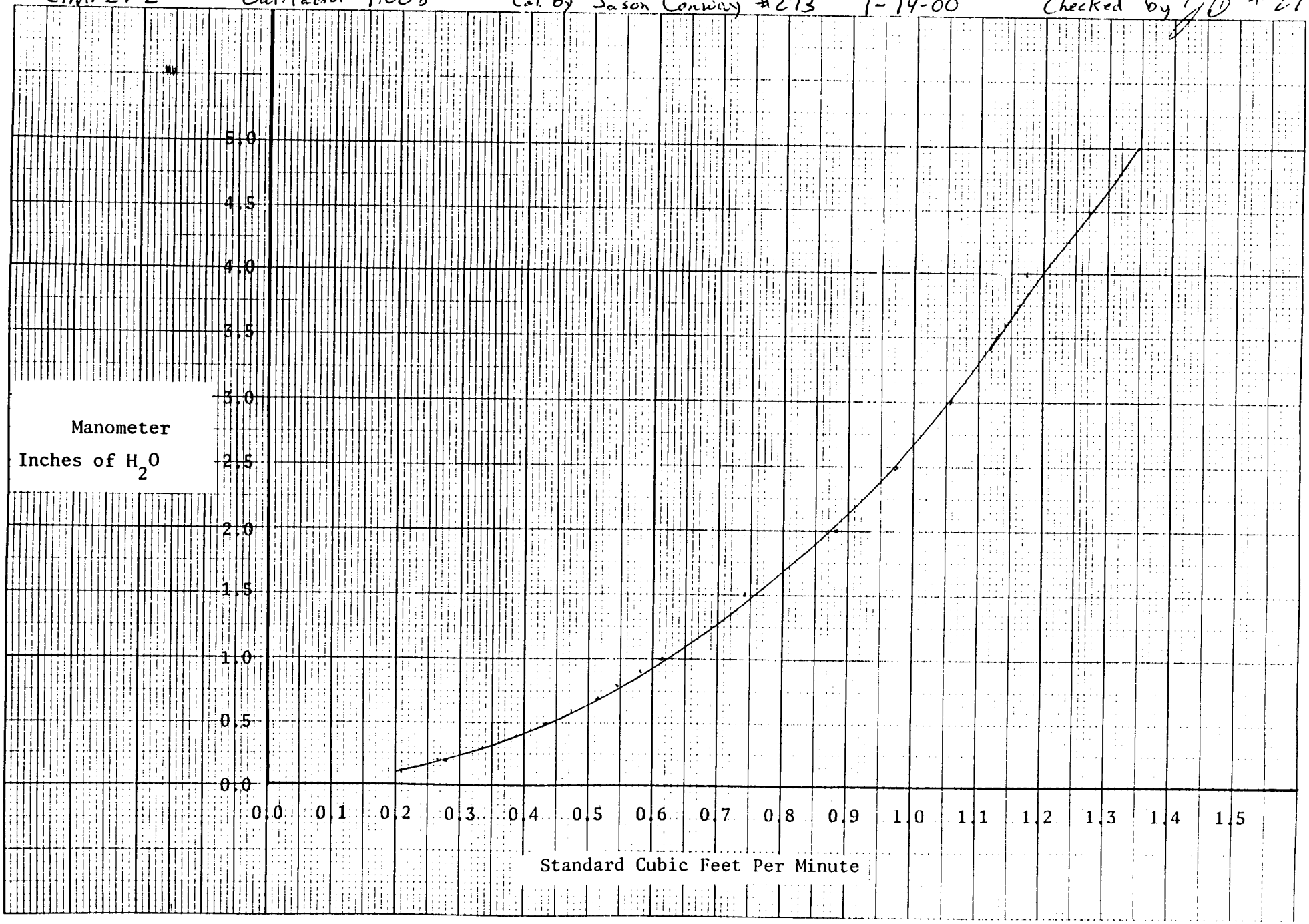
	Wet Test Meter (No. 1)						Dry Gas Meter					
	Time	Meter Reading		Temp.		P_m	Meter Reading		Temp. In		Temp. Out	P_m
End	1530	2.093	cf	68	°F	-0.7 "H_2O	255.920	cf	78	°F	76 °F	0.01 "H_2O
Start	1500	0.000	cf	68	°F	-0.7 "H_2O	253.905	cf	75	°F	75 °F	0.01 "H_2O
Avg.	30	2.093	cf	68	°F	-0.7 "H_2O	2.015	cf	76		°F	0.01 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.093 \left[\frac{30.50 + \frac{-0.7}{13.6}}{68 + 460}\right] \times 1.006\,(C_f) = 2.143 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.015 \left[\frac{30.50 + \frac{0.01}{13.6}}{76 + 460}\right] = 2.024 \text{ dcsf}$$

$$C_{DG} = \frac{2.143}{2.024} = \boxed{1.059}$$

C.M. 27-2 Cal. factor 1.008 Cal. by Jason Conway #273 1-14-00 Checked by GB #274



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

(NEW)

Date: 01-10-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1425	72	75
Ice Bath	1428	37	40
Boiling Water	1434	212	214
Oven	1440	251	254
Oven	1445	300	298
Oven	1449	350	346
Oven	1454	376	371

Meter Adjusted? Yes _____ No ✓

Calibrator: JASON BROWN 274

Checked By: Jason Conway #273

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 11-22-99

ΔH ("H_2O)	C_{DG}
0.5	1.005 ✓
1.0	0.999 ✓
1.5	1.003 ✓
2.0	1.000 ✓
3.0	0.994 ✓
4.0	0.999 ✓
Average	1.000 ✓

Variation: + 0.5% ✓

- 0.6% ✓

Calibrator: Jason Conway #273

Checked By: Scott Hart #268

C_{DG} @ 2 liters/min. = 1.013

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.50 "H_2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	0935	5.003 cf	69 °F	-0.8 "H_2O	738522 cf	87 °F	71 °F	0.5 "H_2O
Start	0922	0.000 cf	69 °F	-0.8 "H_2O	733.505 cf	72 °F	71 °F	0.5 "H_2O
Avg.	13 ✓	5.0031 ✓ cf	69 ✓ °F	-0.8 ✓ "H_2O	5.017 ✓ cf	75 ✓ °F	✓ 0.5 "H_2O	

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.003 \left[\frac{29.24 + \frac{-0.8}{13.6}}{69 + 460}\right] \times 1.000 \quad (C_t) = 4.871 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.017 \left[\frac{29.24 + \frac{0.5}{13.6}}{75 + 460}\right] = 4.846 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{4.871}{4.846} = \boxed{1.005 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.00" H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.06 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1031	5.004 cf	69 °F	-13 "H_2O	744.777 cf	68 °F	71 °F	1.0 "H_2O
Start	1021	0.000 cf	69 °F	-13 "H_2O	239.786 cf	70 °F	71 °F	1.0 "H_2O
Avg.	10 ✓	5.004 ✓ cf	69 ✓ °F	-13 ✓ "H_2O	4.991 ✓ cf	70 ✓ °F	✓ 1.0 "H_2O	

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.004 \left[\frac{29.24 + \frac{-13}{13.6}}{69 + 460}\right] \times 1.000\ (C_f) = 4.866 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 4.991 \left[\frac{29.24 + \frac{1.0}{13.6}}{70 + 460}\right] = 4.872 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{4.866}{4.872} = \boxed{0.999 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 11-22-99

Calibrator: Jason Conway

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.50 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m		Meter Reading	Temp. In	Temp. Out	P_m
End	1049	10,009 cf	69 °F	-1.6	"H_2O	755.874 cf	65 °F	71 °F	1.50 "H_2O
Start	1034	0.000 cf	69 °F	-1.6	"H_2O	745.977 cf	69 °F	71 °F	1.50 "H_2O
Avg.	15 ✓	10.009 ✓ cf	69 ✓ °F	-1.6 ✓	"H_2O	9.897 ✓ cf	69 ✓ °F	✓ 1.50	"H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.009 \left[\frac{29.24 + \frac{-1.6}{13.6}}{69 + 460} \right] \times 1.000 \ (C_p) = 9.725 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.897 \left[\frac{29.24 + \frac{1.50}{13.6}}{69 + 460} \right] = 9.692 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{9.725}{9.692} = \boxed{1.003 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29.1

Date: 11-22-99

Calibrator: Jason Conway

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 3)								Dry Gas Meter					
	Time	Meter Reading		Temp.		P_m		Meter Reading		Temp. In		Temp. Out		P_m	
End	1103	10.088	cf	69	°F	-20	"H_2O	766.667	cf	69	°F	72	°F	2.0	"H_2O
Start	1051	0.000	cf	69	°F	-20	"H_2O	756.663	cf	68	°F	72	°F	2.0	"H_2O
Avg.	12	10.088	cf	69	°F	-20	"H_2O	10.004	cf	70	°F			2.0	"H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.088 \left[\frac{29.24 + \frac{-20}{13.6}}{69 + 460}\right] \times 1.000\,(C_f) = 9.792 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.004 \left[\frac{29.24 + \frac{2.0}{13.6}}{70 + 460}\right] = 9.790 \text{ dcsf}$$

$$C_{DG} = \frac{9.792}{9.790} = \boxed{1.000}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 11-22-99

Calibrator: Jason Conway

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1134	10.011 cf	69 °F	-3.0 "H_2O	788.042 cf	69 °F	73 °F	3.0 "H_2O
Start	1124	0.000 cf	69 °F	-3.0 "H_2O	779.107 cf	66 °F	73 °F	3.0 "H_2O
Avg.	10.0 ✓	10.011 ✓ cf	69 ✓ °F	-3.0 ✓ "H_2O	9.935 ✓ cf	70 ✓ °F		3.0 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.011 \left[\frac{29.24 + \frac{-3.0}{13.6}}{69 + 460}\right] \times 1{,}000\ (C_f) = 9.693 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.935 \left[\frac{29.24 + \frac{3.0}{13.6}}{70 + 460}\right] = 9.747 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{9.693}{9.747} = \boxed{0.994 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 11-21-99

Calibrator: Jason Conway

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 2 @ 4.00 "H2O

P_b: 29.24 "Hg

Control Module Vacuum: 0.00 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1311	10.002 cf	70 °F	-3.8 "H_2O	817.238 cf	68 °F	72 °F	4.0 "H_2O
Start	1302	0.000 cf	70 °F	-3.8 "H_2O	807.425 cf	70 °F	72 °F	4.0 "H_2O
Avg.	9 ✓	10.002 ✓ cf	70 ✓ °F	-3.8 ✓ "H_2O	9.813 ✓ cf	71 ✓ °F		✓ 4.0 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.002 \left[\frac{29.24 + \frac{-3.8}{13.6}}{70 + 460}\right] \times 1.000\ (C_f) = 9.646\ ✓\ \text{dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 9.813 \left[\frac{29.24 + \frac{4.0}{13.6}}{71 + 460}\right] = \cancel{9.651}\ 9.633\ ✓\ \text{dcsf}$$

$$C_{DG} = \frac{9.646}{9.651} = \boxed{0.999\ ✓}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Calibrator: Jason Conway

Date: 11-22-99

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2L/min

P_b: 29.15 "Hg

Control Module Vacuum: 0.00 "Hg

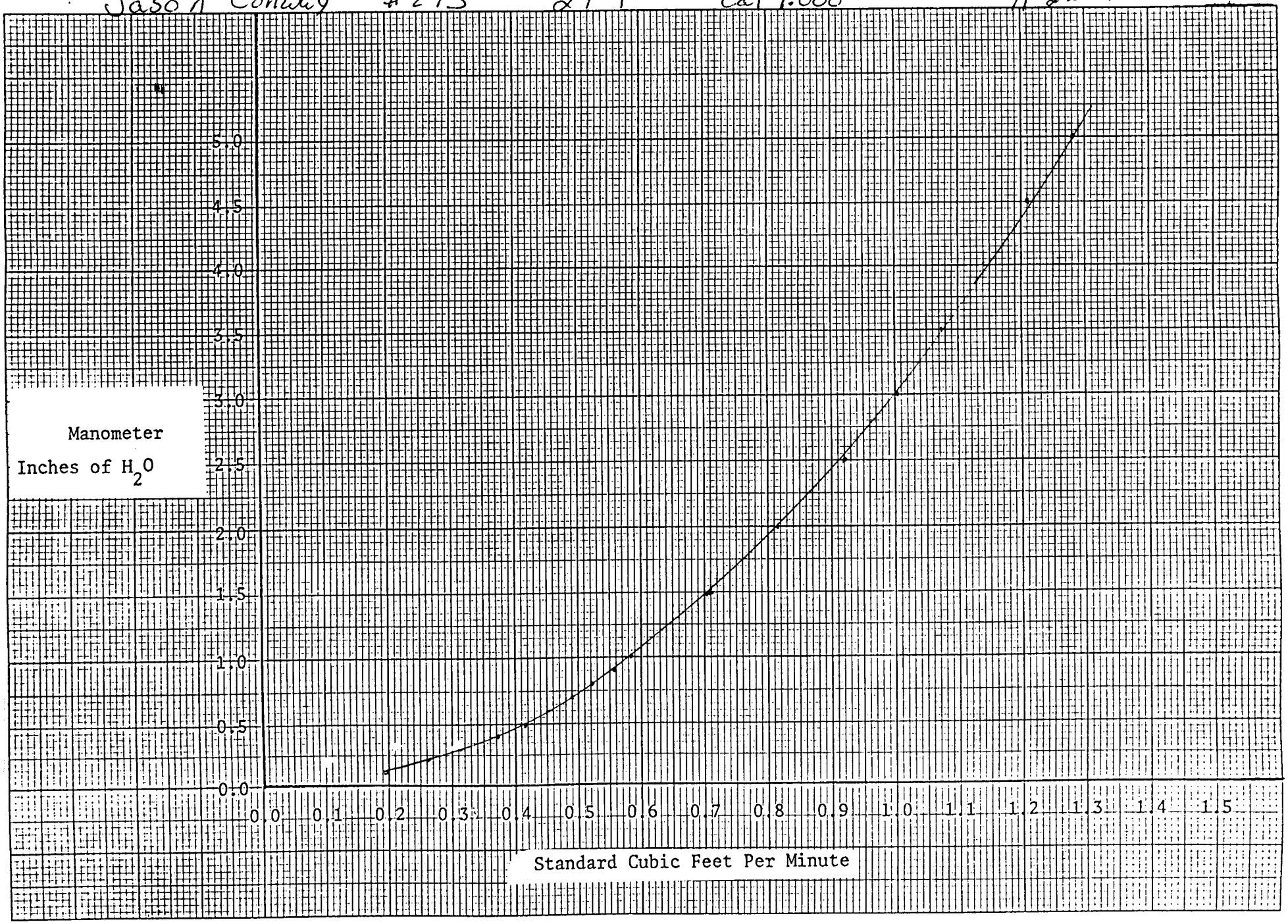
Wet Test Meter (No. 1)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1637	2.229 cf	70 °F	-0.6 "H_2O	873.468 cf	77 °F	72 °F	0.04 "H_2O
Start	1605	0.000 cf	70 °F	-0.6 "H_2O	871.246 cf	72 °F	72 °F	0.04 "H_2O
Avg.	32 ✓	2.229 ✓ cf	70 ✓ °F	-0.6 ✓ "H_2O	2.222 ✓ cf	73 ✓ °F		✓ 0.04 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.229 \left[\frac{29.15 + \frac{-0.6}{13.6}}{70 + 460}\right] \times 1.006\,(C_f) = 2.173 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.222 \left[\frac{29.15 + \frac{0.04}{13.6}}{73 + 460}\right] = 2.145 \text{ dcsf}$$

$$C_{DG} = \frac{2.173}{2.145} = \boxed{1.013}$$

Jason Conway #273 29-1 Cal 1.000 11-22-99



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 11-22-99

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1025	70	70
Ice Bath	1112	35	36
Boiling Water	1050	212	212
Oven	1130	250	251
Oven	1141	300	300
Oven	1153	350	353
Oven	1200	375	375

Meter Adjusted? Yes _____ No ✓

Calibrator: Jason Conway #273

Checked By: Scott Watt #268

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 11-22-99

Time: 1115

Barometric Pressure @ Addison Airport @ 719 ft.	=	29.86
	-	0.719
Absolute Pressure @ Addison Airport	=	29.141
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.224
Barometer Reading	=	29.18
Variation	=	0.044

Barometer Adjusted? Yes ✓ No _____

Scott Hess #268 ✓

Signature of Calibrator

PITOT TUBE CALIBRATION

Date: 01-31-00

Time: 0900

Pitot No.: M1

T_s: 65 °F

Pitot Dimensions: 3/8" tps

C_{pstd}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808
20	40	0.34	0.35	0.587	0.50	0.707	0.822	0.50	0.707	0.822
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.50	1.225	0.808	1.45	1.204	0.822
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.45	1.565	0.800
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.810			0.811

Summary of Results:

Normal high side calibration factor 0.810

variation + 1.48%

variation - 0.25%

Normal low side calibration factor 0.811

variation + 1.36%

variation - 1.36%

Calibrator: Jim Brown 274

Checked By: Scott Hart #268

PITOT TUBE CALIBRATION

Date: 01-31-00

Time: 1000

Pitot No.: M2

T_s: 65 °F

Pitot Dimensions: 3/8" tips

C_{psid}: 0.990

Motor Setting	fps mark	Calibration Standard Start	Calibration Standard End	√Standard Average	High	√High	Cal. Factor	Low	√Low	Cal. Factor
7	20	0.10	0.10	0.316	0.15	0.387	0.808	0.15	0.387	0.808
14	30	0.22	0.22	0.469	0.33	0.574	0.808	0.33	0.574	0.808
20	40	0.34	0.34	0.583	0.51	0.714	0.808	0.51	0.714	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
35	60	0.80	0.80	0.894	1.20	1.095	0.808	1.20	1.095	0.808
41	70	1.00	1.00	1.000	1.45	1.204	0.822	1.45	1.204	0.822
50	80	1.30	1.30	1.140	1.95	1.396	0.808	1.95	1.396	0.808
62	90	1.60	1.60	1.265	2.40	1.549	0.808	2.40	1.549	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
28	50	0.54	0.54	0.735	0.81	0.900	0.808	0.81	0.900	0.808
Average							0.810			0.810

Summary of Results:

Normal high side calibration factor 0.810 ✓

variation + 1.48% ✓

variation - 0.25% ✓

Normal low side calibration factor 0.810 ✓

variation + 1.48% ✓

variation - 0.25% ✓

Calibrator: Sam Bean 274

Checked By: Scott Hart #268

NOZZLE CALIBRATION

Nozzle Set No. TFE-2 checked Scott Holt 368

Date 01-31-00 Calibrator: [illegible] 274

	4	6a	7	8	10	12
Reading 1	0.114	0.175	0.195	0.230	0.310	0.361
Reading 2	0.115	0.173	0.196	0.234	0.310	0.359
Reading 3	0.116	0.165	0.195	0.231	0.309	0.361
Reading 4	0.115	0.169	0.193	0.235	0.310	0.362
Reading 5	0.114	0.171	0.195	0.234	0.308	0.362
Reading 6	0.116	0.171	0.194	0.234	0.310	0.363
Reading 7	0.115	0.173	0.193	0.235	0.310	0.360
Reading 8	0.114	0.169	0.197	0.232	0.309	0.360
Reading 9	0.115	0.171	0.195	0.234	0.309	0.361
Reading 10	0.115	0.171	0.195	0.234	0.310	0.361
Average	0.115 ✓	0.171 ✓	0.195 ✓	0.233 ✓	0.310 ✓	0.361 ✓

	14	—	—	—	—	—
Reading 1	0.431					
Reading 2	0.434					
Reading 3	0.434					
Reading 4	0.433					
Reading 5	0.432					
Reading 6	0.435					
Reading 7	0.434					
Reading 8	0.434					
Reading 9	0.434					
Reading 10	0.435					
Average	0.434 ✓					

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 27-2

Date: 3-09-00

ΔH ("H_2O)	C_{DG}
0.5	1.031 ✓
1.0	1.032 ✓
1.5	1.031 ✓
2.0	1.028 ✓
3.0	1.022 ✓
4.0	1.021
Average	1.028

Variation: + 0.39 %

- 0.68 %

Calibrator: Mike Bass

Checked By: [signature] 236

C_{DG} @ 2 liters/min. = 0.963

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 5.5 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1029	5.244 cf	70 °F	-0.85 "H_2O	853.599 cf	75 °F	73 °F	0.50 "H_2O
Start	1016	0.000 cf	70 °F	-0.85 "H_2O	848.501 cf	74 °F	72 °F	0.50 "H_2O
Avg.	13	5.244 cf	70 °F	-0.85 "H_2O	5.098 cf	74 °F		0.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.244 \left[\frac{29.41 + \frac{-0.850}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 5.115 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.098 \left[\frac{29.41 + \frac{0.500}{13.6}}{74 + 460}\right] = 4.962 \text{ dcsf}$$

$$C_{DG} = \frac{5.115}{4.962} = \boxed{1.031}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1040	5.362 cf	70 °F	-1.35 "H_2O	859.101 cf	75 °F	73 °F	1.00 "H_2O
Start	1031	0.000 cf	70 °F	-1.35 "H_2O	853.906 cf	75 °F	73 °F	1.00 "H_2O
Avg.	9	5.362 cf	70 °F	-1.35 "H_2O	5.195 cf	74 °F		1.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.362 \left[\frac{29.41 + \frac{-1.350}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 5.223 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.195 \left[\frac{29.41 + \frac{1.000}{13.6}}{74 + 460}\right] = 5.063 \text{ dcsf}$$

$$C_{DG} = \frac{5.223}{5.063} = \boxed{1.032}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.5" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 6.0 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1057	10.625 cf	70 °F	-1.80 "H_2O	869.702 cf	77 °F	75 °F	1.50 "H_2O
Start	1042	0.000 cf	70 °F	-1.80 "H_2O	859.402 cf	75 °F	74 °F	1.50 "H_2O
Avg.	15	10.625 cf	70 °F	-1.80 "H_2O	10.300 cf	75	°F	1.500 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.625 \left[\frac{29.41 + \frac{-1.800}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 10.339 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.300 \left[\frac{29.41 + \frac{1.500}{13.6}}{75 + 460}\right] = 10.031 \text{ dcsf}$$

$$C_{DG} = \frac{10.339}{10.031} = \boxed{1.031}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27.2

Date: 3-09-00

Calibrator: Mike Bass

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 6.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1013	10.738 cf	70 °F	-2.10 "H_2O
Start	1059	0.000 cf	70 °F	-2.10 "H_2O
Avg.	14	10.738 cf	70 °F	-2.100 "H_2O

Dry Gas Meter

Meter Reading	Temp. In	Temp. Out	P_m
880.444 cf	77 °F	75 °F	2.00 "H_2O
870.007 cf	76 °F	75 °F	2.00 "H_2O
10.437 cf	76 °F		2.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.738 \left[\frac{29.41 + \frac{-2.100}{13.6}}{70 + 460}\right] \times 0.998\ (C_f) = 10.441 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.437 \left[\frac{29.41 + \frac{2.000}{13.6}}{76 + 460}\right] = 10.158 \text{ dcsf}$$

$$C_{DG} = \frac{10.441}{10.158} = \boxed{1.028}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: Z7-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)

	Time	Meter Reading	Temp.	P_m
End	1134	10.635 cf	70 °F	-2.90 "H_2O
Start	1123	0.000 cf	70 °F	-2.90 "H_2O
Avg.	11	10.635 cf	70 °F	-2.900 "H_2O

Dry Gas Meter

	Meter Reading	Temp. In	Temp. Out	P_m
End	893.404 cf	79 °F	76 °F	3.00 "H_2O
Start	883.037 cf	77 °F	75 °F	3.00 "H_2O
Avg.	10.367 cf	77 °F		3.000 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.635 \left[\frac{29.41 + \frac{-2.900}{13.6}}{70 + 460}\right] \times 0.998 \quad (C_f) = 10.320 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.367 \left[\frac{29.41 + \frac{3.000}{13.6}}{77 + 460}\right] = 10.096 \text{ dcsf}$$

$$C_{DG} = \frac{10.320}{10.096} = \boxed{1.022}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.75" H_2O

P_b: 29.41 "Hg

Control Module Vacuum: 2.5 "Hg

Wet Test Meter (No. 3)					Dry Gas Meter				
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1150	10.682 cf	70 °F	-3.50 "H_2O	904.404 cf	81 °F	77 °F	3.750 "H_2O
Start	1140	0.000 cf	70 °F	-3.50 "H_2O	893.991 cf	77 °F	76 °F	3.750 "H_2O
Avg.	10	10.682 cf	70 °F	-3.500 "H_2O	10.413 cf	78 °F		3.750 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.682 \left[\frac{29.41 + \frac{-3.500}{13.6}}{70 + 460}\right] \times 0.998\,(C_f) = 10.350 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.413 \left[\frac{29.41 + \frac{3.750}{13.6}}{78 + 460}\right] = 10.141 \text{ dcsf}$$

$$C_{DG} = \frac{10.370}{10.141} = \boxed{1.021}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 27-2

Calibrator: Mike Bass

Date: 3-09-00

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2.0 L/min

P_b: 29.40 "Hg

Control Module Vacuum: < 2 "Hg

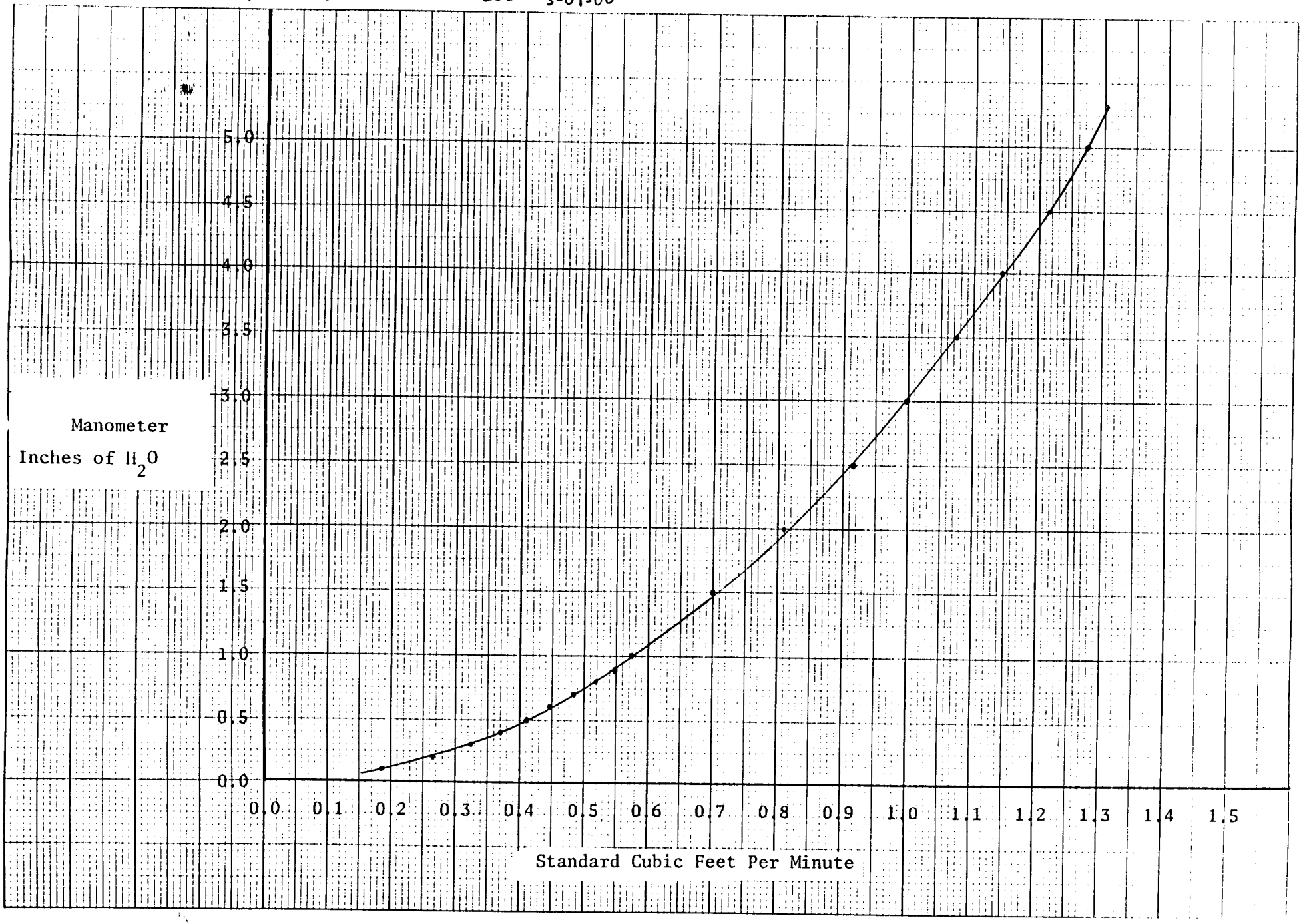
	Wet Test Meter (No. 1)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1353	2.102 cf	69 °F	-0.30 "H_2O	909.861 cf	76 °F	76 °F	0.015 "H_2O
Start	1320	0.000 cf	69 °F	-0.30 "H_2O	907.673 cf	76 °F	76 °F	0.015 "H_2O
Avg.	33	2.102 cf	69 °F	-0.30 "H_2O	2.188 cf	76 °F		0.015 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.102 \left[\frac{29.40 + \frac{-0.300}{13.6}}{69 + 460}\right] \times 0.990\ (C_f) = 2.040 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.188 \left[\frac{29.40 + \frac{0.015}{13.6}}{76 + 460}\right] = 2.118 \text{ dcsf}$$

$$C_{DG} = \frac{2.040}{2.118} = \boxed{0.963}$$

CM 27-2 cf: 1.028 Mike Bass #263 3-09-00



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 27-2

CALIBRATION DATA

Date: 3-09-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1003	72	72
Ice Bath	1005	35	36
Boiling Water	1007	212	213
Oven	1018	250	250
Oven	1025	297	297
Oven	1029	351	351
Oven	1031	374	374

Meter Adjusted? Yes _____ No X

Calibrator: Mike Bass

Checked By: [illegible] 236

METCO ENVIRONMENTAL

Dry Gas Meter Calibration

Dry Gas Meter No.: 29-1

Date: 2-7-00

ΔH ("H_2O)	C_{DG}
0.5	0.990
1.0	0.996
1.5	1.001
2.0	1.004
3.0	1.005
4.0	0.991
Average	0.998

Variation: + 0.80%

- 0.70%

Calibrator: Steve Lee 261

Checked By: Jason Cameron #273

C_{DG} @ 2 liters/min. = 1.023

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 0.5" H_2O

P_b: 29.11 "Hg

Control Module Vacuum: 50 "Hg

Wet Test Meter (No. 3)	Time	Meter Reading	Temp.	P_m
End	1148	5.093 cf	67 °F	-1.30 "H_2O
Start	1136	0.000 cf	67 °F	-1.30 "H_2O
Avg.	12'	5.093 cf	67 °F	-1.30 "H_2O

Dry Gas Meter	Meter Reading	Temp. In	Temp. Out	P_m
End	384.125 cf	61 °F	63 °F	0.50 "H_2O
Start	379.053 cf	62 °F	62 °F	0.50 "H_2O
Avg.	5.072 cf	62 °F	°F	0.50 "H_2O

$$Wet\ Test\ Meter\ Vm_{std} = 17.65 \times 5.093 \left[\frac{29.11 + \frac{-1.30}{13.6}}{67 + 460} \right] \times 1.000\ (C_f) = 4.949\ dcsf$$

$$Dry\ Gas\ Meter\ Vm_{std} = 17.65 \times 5.072 \left[\frac{29.11 + \frac{0.50}{13.6}}{62 + 460} \right] = 4.999\ dcsf$$

$$C_{DG} = \frac{4.949}{4.999} = \boxed{0.990}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.0" H_2O

P_b: 29.11 "Hg

Control Module Vacuum: 50 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1200	5.152 cf	67 °F	-1.70 "H_2O	390.354 cf	61 °F	66 °F	1.00 "H_2O
Start	1152	0.000 cf	67 °F	-1.70 "H_2O	385.254 cf	62 °F	64 °F	1.00 "H_2O
Avg.	8	5.152 cf	67 °F	-1.70 "H_2O	5.100 cf	63 °F		1.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 5.152 \left[\frac{29.11 + \frac{-1.70}{13.6}}{67 + 460} \right] \times 1.000\ (C_f) = 5.001 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 5.100 \left[\frac{29.11 + \frac{1.00}{13.6}}{63 + 460} \right] = 5.023 \text{ dcsf}$$

$$C_{DG} = \frac{5.001}{5.023} = \boxed{0.996}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 1.5 "H_2O

P_b: 29.11 "Hg

Control Module Vacuum: 50 "Hg

	Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m		Meter Reading	Temp. In	Temp. Out	P_m
End	1326	10.185 cf	67 °F	-2.30 "H_2O		401.204 cf	60 °F	67 °F	1.50 "H_2O
Start	1312	0.000 cf	67 °F	-2.30 "H_2O		391.183 cf	64 °F	64 °F	1.50 "H_2O
Avg.	14 ✓	10.185 ✓ cf	67 ✓ °F	-2.30 ✓ "H_2O		10.021 ✓ cf	64 ✓ °F		1.50 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.185 \left[\frac{29.11 + \frac{-2.30}{13.6}}{67 + 460} \right] \times 1.000 \ (C_1) = 9.872 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.021 \left[\frac{29.11 + \frac{1.50}{13.6}}{64 + 460} \right] = 9.863 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{9.872}{9.863} = \boxed{1.001 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 20" H.O

P_b: 29.11 "Hg

Control Module Vacuum: 5.0 "Hg

Wet Test Meter (No. 3)	Time	Meter Reading	Temp.	P_m	Dry Gas Meter	Meter Reading	Temp. In	Temp. Out	P_m
End	1340	10.182 cf	67 °F	-2.70 "H_2O		411.751 cf	58 °F	72 °F	2.00 "H_2O
Start	1329	0.000 cf	67 °F	-2.70 "H_2O		401.747 cf	63 °F	69 °F	2.00 "H_2O
Avg.	11 ✓	10.182 ✓ cf	67 ✓ °F	-2.70 ✓ "H_2O		10.004 ✓ cf	66 ✓ °F		2.00 ✓ "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.182 \left[\frac{29.11 + \frac{-2.70}{13.6}}{67 + 460} \right] \times 1.000\ (C_f) = 9.859 \checkmark \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.004 \left[\frac{29.11 + \frac{2.00}{13.6}}{66 + 460} \right] = 9.821 \checkmark \text{ dcsf}$$

$$C_{DG} = \frac{9.859}{9.821} = \boxed{1.004 \checkmark}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 3.0" H_2O

P_b: 29.11 "Hg

Control Module Vacuum: 5.0 "Hg

	Wet Test Meter (No. 3)					Dry Gas Meter				
	Time	Meter Reading	Temp.		P_m	Meter Reading	Temp. In	Temp. Out		P_m
End	1359	11.380 cf	67	°F	-3.80 "H_2O	424.224 cf	56	74	°F	3.00 "H_2O
Start	1346	0.000 cf	67	°F	-3.80 "H_2O	413.070 cf	66	74	°F	3.00 "H_2O
Avg.	11	11.380 cf	67	°F	-3.80 "H_2O	11.154 cf	68		°F	3.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 11.380 \left[\frac{29.11 + \frac{-3.80}{13.6}}{67 + 460} \right] \times 1.000\ (C_f) = 10.988 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 11.154 \left[\frac{29.11 + \frac{3.00}{13.6}}{68 + 460} \right] = 10.936 \text{ dcsf}$$

$$C_{DG} = \frac{10.988}{10.936} = \boxed{1.005}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 4.0 "H_2O

P_b: 29.11 "Hg

Control Module Vacuum: 5.0 "Hg

	Wet Test Meter (No. 3)				Dry Gas Meter			
	Time	Meter Reading	Temp.	P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1412	10.533 cf	67 °F	-4.50 "H_2O	437.440 cf	53 °F	75 °F	4.00 "H_2O
Start	1403	0.000 cf	67 °F	-4.50 "H_2O	427.061 cf	62 °F	75 °F	4.00 "H_2O
Avg.	9	10.533 cf	67 °F	-4.50 "H_2O	10.379 cf	66 °F		4.00 "H_2O

$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 10.533 \left[\frac{29.11 + \frac{-4.50}{13.6}}{67 + 460} \right] \times 1.000\ (C_f) = 10.152 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 10.379 \left[\frac{29.11 + \frac{4.00}{13.6}}{66 + 460} \right] = 10.241 \text{ dcsf}$$

$$C_{DG} = \frac{10.152}{10.241} = \boxed{0.991}$$

METCO ENVIRONMENTAL

DRY GAS METER CALIBRATION

Meter Number: 29-1

Date: 2-7-00

Calibrator: Shane Lee 261

$$\text{Calibration Factor } (C_{DG}) = \frac{\text{Wet Test Meter } Vm_{std}}{\text{Dry Gas Meter } Vm_{std}}$$

Run No.: 1 @ 2L/min.

P_b: 29.11 "Hg

Control Module Vacuum: 5.0 "Hg

	Wet Test Meter (No. 3)					Dry Gas Meter			
	Time	Meter Reading	Temp.		P_m	Meter Reading	Temp. In	Temp. Out	P_m
End	1526	2.071	cf	68 °F	−0.30 "H_2O	440.205 cf	78 °F	78 °F	0.01 "H_2O
Start	1456	0.000	cf	68 °F	−0.30 "H_2O	438.156 cf	72 °F	72 °F	0.01 "H_2O
Avg.	30	2.071	cf	68 °F	−0.30 "H_2O	2.049 cf	75 °F		0.01 "H_2O

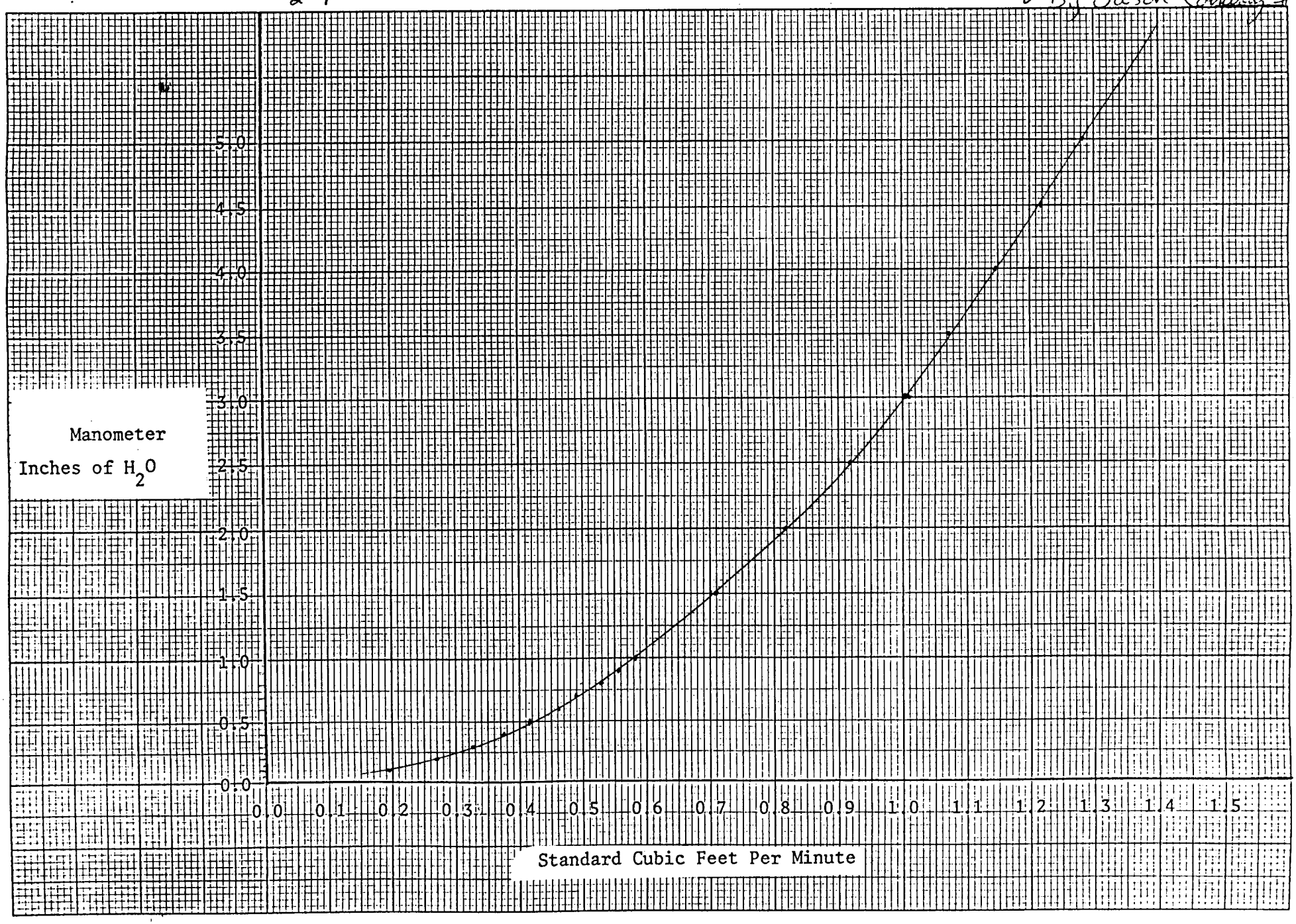
$$\text{Wet Test Meter } Vm_{std} = 17.65 \times 2.071 \left[\frac{29.11 + \frac{-0.30}{13.6}}{68 + 460}\right] \times 1.000 \ (C_1) = 2.014 \text{ dcsf}$$

$$\text{Dry Gas Meter } Vm_{std} = 17.65 \times 2.049 \left[\frac{29.11 + \frac{0.01}{13.6}}{75 + 460}\right] = 1.968 \text{ dcsf}$$

$$C_{DG} = \frac{2.014}{1.968} = \boxed{1.023}$$

Shane Lee 261
CM 29-1 0.998
2-7-00

✓ By Jason Cowdin #27



METCO ENVIRONMENTAL

DIGITAL TEMPERATURE INDICATOR NO. 29-1

CALIBRATION DATA

Date: 2-7-00

Media	Time	Mercury Temperature (°F)	DTI (°F)
Ambient Air	1051	64	62
Ice Bath	1052	33	32
Boiling Water	1054	212	212
Oven	1058	250	250
Oven	1059	300	299
Oven	1101	350	351
Oven	1102	375	375

Meter Adjusted? Yes _____ No ✓

Calibrator: Shane Lee #261

Checked By: Jason Conway #273

METCO ENVIRONMENTAL

BAROMETER CALIBRATION

Barometer No. 19-1

Date: 01-31-00

Time: 1600

Barometric Pressure @ Addison Airport @ 719 ft.	=	30.17
	-	0.719
Absolute Pressure @ Addison Airport	=	29.451 ✓
	+	0.083
Absolute Pressure @ METCO @ 636 ft.	=	29.534 ✓
Barometer Reading	=	29.61
Variation	=	~~0.269~~ -0.08 ✓

Barometer Adjusted? Yes ✓ No _____

Signature of Calibrator

APPENDIX D

Analytical Data

TestAmerica
INCORPORATED

Doug Saathoff
METCO Environmental
P.O. Box 598
Addison, Texas 75001

March 17, 2000

Dear Doug,

Please find included with this letter the analytical report and data package for the EPRI-KCPL samples submitted to TestAmerica for analysis. The samples were analyzed following the SOP based on the Ontario-Hydro Method and ASTM 6414-99.

Case Narrative

TestAmerica received the samples for analysis by the Ontario Hydro Method on February 2, 2000. The coal samples were received February 7, 2000. All samples were intact when received. Please note the following:

- A large number of Reagent Blanks and Blank Train Samples contained low-level detections. Container #3 of the Inlet Blank Train contained a significant Hg detection. The sample was re-prepared and reanalyzed to confirm results. The reanalysis results are included with the report.
- The Reagent Blank associated with Container #5 (Container #10) had low level Hg detection. Container #5 results are blank corrected.
- The Thimble Blank had a low level Hg detection. The Stack Filters (Container #1A) are blank corrected.
- Two of the four results for the Standard Reference Material that was analyzed with the filter/particulate samples were just above the control limits (The results were 0.161 ug/g and 0.162 ug/g. The control limits are 0.122 to 0.160 ug/g.)
- One of the two digestion blanks that were prepared with the filter/particulate samples showed a low level detection of 0.004 ug. These blanks are additional QC checks that TestAmerica analyzes to check for reagent contamination. The samples could not be repeated, as only one digestion is possible on the effected filters.
- All Duplicate and Triplicate sample results had a Relative Percent Difference of <10 %.
- All Matrix Spike sample results had a % Recovery between 75 % and 125 %.
- All other Quality Control Indicators were within acceptance limits.

If you have any questions or need additional information about this data package, please feel free to contact me at 937-294-6856.

Sincerely,

James A. Davis

James A. Davis
QA Coordinator

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

Ontario Hydro Method Results

TestAmerica
INCORPORATED

Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Summary Report

	Unit 1 Stack Run 1	Unit 1 Stack Run 2	Unit 1 Stack Run 3	Unit 1 Precipiation East Inlet Duct Run 1	Unit 1 Precipiation East Inlet Duct Run 2	Unit 1 Precipiation East Inlet Duct Run 3
Particle Bound Hg (ug)	0.038	0.030	0.032	2.77	1.40	2.59
Oxidized Hg (ug)	3.54	4.14	3.71	2.64	3.90	4.53
Elemental Hg (ug)	7.54	9.45	9.15	8.57	7.60	7.44
Total Hg (ug)	11.12	13.62	12.89	13.99	12.91	14.56

	Unit 1 Stack Blank Train	Unit 1 Precipiation East Inlet Duct Blank Train
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	0.045	0.615
Elemental Hg (ug)	0.032	0.019
Total Hg (ug)	0.077	0.634

	Reagent Blanks
Container # 7 (ug/L)	<0.050
Container # 8 (ug/L)	<0.070
Container # 9 (ug/L)	<0.123
Container # 10 (ug/L)	0.112
Container # 11 (ug/L)	<0.050
Container # 12 (Thimble) (ug)	0.019
Container # 12 (47 mm) (ug)	<0.0025

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Duplicate Summary Report

	Unit 1 Stack Run 1	Unit 1 Stack Run 2	Unit 1 Stack Run 3	Unit 1 Precipiation East Inlet Duct Run 1	Unit 1 Precipiation East Inlet Duct Run 2	Unit 1 Precipiation East Inlet Duct Run 3
Particle Bound Hg (ug)	0.037	0.030	0.033	2.77	1.40	2.61
Oxidized Hg (ug)	3.56	4.26	3.71	2.59	3.76	4.56
Elemental Hg (ug)	7.50	9.25	8.96	8.28	7.35	7.34
Total Hg (ug)	11.10	13.54	12.70	13.64	12.52	14.51

	Unit 1 Stack Blank Train	Unit 1 Precipiation East Inlet Duct Blank Train
Particle Bound Hg (ug)	0.000	0.000
Oxidized Hg (ug)	0.044	0.631
Elemental Hg (ug)	0.030	0.016
Total Hg (ug)	0.074	0.647

	Reagent Blanks
Container # 7 (ug/L)	<0.050
Container # 8 (ug/L)	<0.070
Container # 9 (ug/L)	<0.123
Container # 10 (ug/L)	0.121
Container # 11 (ug/L)	<0.050
Container # 12 (Thimble) (ug)	0.020
Container # 12 (47 mm) (ug)	<0.0025

TestAmerica
INCORPORATED

Sample ID: **EPRI-KCPL**
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Spike Summary Report

TestAmerica ID	Sample ID	Sample Result	Spike Result	Spike Amount	% Recovery
IR3KC-4	Unit 1 Prec. East Inlet Duct Run 3, Cont. #4	0.048 ug	0.420 ug	0.452 ug	82
IR3KC-5	Unit 1 Prec. East Inlet Duct Run 3, Cont. #5	7.39 ug	11.85 ug	4.40 ug	101
SR3KC-2	Unit 1 Stack Run 3, Cont. #2	<0.007 ug	0.171 ug	0.147 ug	116
SR3KC-3	Unit 1 Stack Run 3, Cont. #3	3.71 ug	5.63 ug	2.18 ug	88
SR3KC-4	Unit 1 Stack Run 3, Cont. #4	0.036 ug	0.437 ug	0.464 ug	86
SR3KC-5	Unit 1 Stack Run 3, Cont. #5	9.11 ug	14.35 ug	4.90 ug	107
IR2KC-1B	Unit 1 Prec. East Inlet Duct Run 2, Cont. #1B	0.004 ug	0.0545 ug	0.050 ug	101
SR1KC-1A	Unit 1 Stack Run 1, Cont. #1A	0.000 ug	0.151 ug	0.150 ug	101

Corrected Page - 4/10/2000

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

TestAmerica
INCORPORATED

Sample ID: EPRI-KCPL
Clinton, Missouri

Unit 1 Stack Run 1

Hg Analysis
Ontario Hydro Method

Collected On: 1/18/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	SR1KC-1A	03/02/00	03/03/00	jpp	0.000	0.000	<1.0	---	---	ug		(Q85) *1
Container # 1B	SR1KC-1B	03/02/00	03/03/00	jpp	0.008	0.008	1.2	0.008	2.5	ug		(47Q128)
Container # 1B	SR1KC-1B	03/02/00	03/03/00	jpp	0.005	0.005	1.0	---	---	ug		(47Q132)
Container # 2	SR1KC-2	02/25/00	02/25/00	jpp	0.009	0.008	5.5	---	---	ug		
Container # 3	SR1KC-3	02/25/00	02/25/00	jpp	3.54	3.56	<1.0	---	---	ug		
Container # 4	SR1KC-4	02/28/00	03/03/00	jpp	0.033	0.032	1.3	---	---	ug		
Container # 5	SR1KC-5	02/24/00	02/24/00	jpp	7.51	7.47	<1.0	---	---	ug		*1

Particle Bound Hg (ug) 0.022
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 3.54
(Containers 3)

Elemental Hg (ug) 7.54
(Containers 4 and 5)

Total Hg (ug) 11.11
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 0.021
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 3.56
(Containers 3)

Dup. Elemental Hg (ug) 7.50
(Containers 4 and 5)

Dup. Total Hg (ug) 11.08
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

TestAmerica
INCORPORATED

Sample ID: EPRI-KCPL
Clinton, Missouri

Unit 1 Stack Run 2

Hg Analysis
Ontario Hydro Method

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	SR2KC-1A	03/02/00	03/03/00	jpp	0.011	0.011	<1.0	—	—	ug		(Q91) *1
Container # 1B	SR2KC-1B	03/02/00	03/03/00	jpp	<0.0025	<0.0025	<1.0	—	—	ug		(47Q134)
Container # 2	SR2KC-2	02/25/00	02/25/00	jpp	<0.011	<0.011	<1.0	<0.011	<1.0	ug		
Container # 3	SR2KC-3	02/25/00	02/25/00	jpp	4.14	4.26	2.9	4.21	1.8	ug		
Container # 4	SR2KC-4	02/28/00	03/03/00	jpp	0.044	0.042	4.3	0.043	2.1	ug		
Container # 5	SR2KC-5	02/24/00	02/24/00	jpp	9.41	9.21	2.1	9.36	<1.0	ug		*1

Particle Bound Hg (ug) 0.011
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 4.14
(Containers 3)

Elemental Hg (ug) 9.45
(Containers 4 and 5)

Total Hg (ug) 13.61
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 0.011
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 4.26
(Containers 3)

Dup. Elemental Hg (ug) 9.25
(Containers 4 and 5)

Dup. Total Hg (ug) 13.52
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

TestAmerica
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Sample ID: EPRI-KCPL
Clinton, Missouri

Unit 1 Stack Run 3

Hg Analysis
Ontario Hydro Method

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	SR3KC-1A	03/02/00	03/03/00	jpp	0.006	0.006	<1.0	---	---	ug		(Q94) *1
Container # 1B	SR3KC-1B	03/03/00	03/03/00	jpp	0.007	0.008	4.6	---	---	ug		(47Q137)
Container # 2	SR3KC-2	02/25/00	02/25/00	jpp	<0.007	<0.007	<1.0	---	---	ug		
Container # 3	SR3KC-3	02/25/00	02/25/00	jpp	3.71	3.71	<1.0	---	---	ug		
Container # 4	SR3KC-4	02/28/00	03/03/00	jpp	0.036	0.035	2.6	---	---	ug		
Container # 5	SR3KC-5	02/24/00	02/24/00	jpp	9.11	8.92	2.2	---	---	ug		*1

Particle Bound Hg (ug) 0.013
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 3.71
(Containers 3)

Elemental Hg (ug) 9.15
(Containers 4 and 5)

Total Hg (ug) 12.87
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 0.014
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 3.71
(Containers 3)

Dup. Elemental Hg (ug) 8.96
(Containers 4 and 5)

Dup. Total Hg (ug) 12.68
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

TestAmerica
INCORPORATED

Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Unit 1 Precipiation East Inlet Duct Run 1

Collected On: 1/18/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	IR1KC-1A	03/02/00	03/03/00	jpp	2.73	2.73	<1.0	—	—	ug		(Q84)
Container # 1B	IR1KC-1B	03/02/00	03/03/00	jpp	0.005	0.005	<1.0	—	—	ug		(47Q127)
Container # 2	IR1KC-2	02/25/00	02/25/00	jpp	0.039	0.036	7.6	—	—	ug		
Container # 3	IR1KC-3	02/25/00	02/25/00	jpp	2.64	2.59	1.6	—	—	ug		
Container # 4	IR1KC-4	02/28/00	03/03/00	jpp	0.03	0.03	2.9	—	—	ug		
Container # 5	IR1KC-5	02/24/00	02/24/00	jpp	8.54	8.25	3.4	—	—	ug		*1

Particle Bound Hg (ug) 2.77
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 2.64
(Containers 3)

Elemental Hg (ug) 8.57
(Containers 4 and 5)

Total Hg (ug) 13.99
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 2.77
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 2.59
(Containers 3)

Dup. Elemental Hg (ug) 8.28
(Containers 4 and 5)

Dup. Total Hg (ug) 13.64
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

TestAmerica
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Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Unit 1 Precipiation East Inlet Duct Run 2

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	IR2KC-1A	03/02/00	03/03/00	jpp	1.40	1.40	<1.0	---	---	ug		(Q92)
Container # 1B	IR2KC-1B	03/02/00	03/03/00	jpp	0.004	0.004	4.8	---	---	ug		(47Q135)
Container # 2	IR2KC-2	02/25/00	02/25/00	jpp	<0.012	<0.012	<1.0	---	---	ug		
Container # 3	IR2KC-3	02/25/00	02/25/00	jpp	3.90	3.76	3.5	---	---	ug		
Container # 4	IR2KC-4	02/28/00	03/03/00	jpp	0.053	0.051	3.4	0.054	1.7	ug		
Container # 5	IR2KC-5	02/24/00	02/24/00	jpp	7.55	7.30	3.3	7.5	<1.0	ug		*1

Particle Bound Hg (ug) 1.40
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 3.90
(Containers 3)

Elemental Hg (ug) 7.60
(Containers 4 and 5)

Total Hg (ug) 12.91
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 1.40
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 3.76
(Containers 3)

Dup. Elemental Hg (ug) 7.35
(Containers 4 and 5)

Dup. Total Hg (ug) 12.52
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

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Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Unit 1 Precipiation East Inlet Duct Run 3

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A	IR3KC-1A	03/02/00	03/03/00	jpp	2.54	2.56	<1.0	---	---	ug		(Q93)
Container # 1B	IR3KC-1B	03/02/00	03/03/00	jpp	0.005	0.005	2.2	---	---	ug		(47Q136)
Container # 2	IR3KC-2	02/25/00	02/25/00	jpp	0.042	0.042	<1.0	---	---	ug		
Container # 3	IR3KC-3	02/25/00	02/25/00	jpp	4.53	4.56	<1.0	---	---	ug		
Container # 4	IR3KC-4	02/28/00	03/03/00	jpp	0.048	0.044	9.8	---	---	ug		
Container # 5	IR3KC-5	02/24/00	02/24/00	jpp	7.39	7.30	1.2	---	---	ug		*1

Particle Bound Hg (ug) 2.59
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 4.53
(Containers 3)

Elemental Hg (ug) 7.44
(Containers 4 and 5)

Total Hg (ug) 14.56
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 2.61
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 4.56
(Containers 3)

Dup. Elemental Hg (ug) 7.34
(Containers 4 and 5)

Dup. Total Hg (ug) 14.51
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

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Sample ID: EPRI-KCPL
Clinton, Missouri

Unit 1 Stack Blank Train

Hg Analysis
Ontario Hydro Method

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided		jpp	—	—	—	—	—	ug		
Container # 1B		Not Provided		jpp	—	—	—	—	—	ug		
Container # 2		Not Provided		jpp	—	—	—	—	—	ug		
Container # 3	SBTKC-3	02/28/00	03/03/00	jpp	0.045	0.044	29	—	—	ug		
Container # 4	SBTKC-4	02/28/00	03/03/00	jpp	0.032	0.030	4.4	—	—	ug		
Container # 5	SBTKC-5	02/24/00	02/24/00	jpp	0.000	0.000	<1.0	—	—	ug		*1

Particle Bound Hg (ug) 0.00
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 0.05
(Containers 3)

Elemental Hg (ug) 0.03
(Containers 4 and 5)

Total Hg (ug) 0.08
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 0.00
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 0.04
(Containers 3)

Dup. Elemental Hg (ug) 0.03
(Containers 4 and 5)

Dup. Total Hg (ug) 0.07
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes: * 1 Reagent Blank Corrected.

TestAmerica
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Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Unit 1 Precipiation East Inlet Duct Blank Train

Collected On: 1/19/00
Collected By: METCO

Container # 1A - Main Filter
Container # 1B - Backup Filter
Container # 2 - 0.1 N HNO3 Rinse
Container # 3 - KCl Impingers (1,2,3)/10 %HNO3 Rinse
Container # 4 - HNO3/H2O2 Impinger (4)/0.1 N HNO3 Rinse
Container # 5 - H2SO4/KMnO4 Impinger (5,6,7)/0.1 N HNO3 Rinse

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 1A		Not Provided		jpp	---	---	---	---	---	ug		
Container # 1B		Not Provided		jpp	---	---	---	---	---	ug		
Container # 2		Not Provided		jpp	---	---	---	---	---	ug		
Container # 3	IBTKC-3	02/28/00	03/03/00	jpp	0.615	0.631	2.6	---	---	ug		*1
Container # 4	IBTKC-4	02/28/00	03/03/00	jpp	<0.021	<0.021	<1.0	---	---	ug		
Container # 5	IBTKC-5	02/24/00	02/24/00	jpp	0.019	0.016	3.4	---	---	ug		*2

Particle Bound Hg (ug) 0.00
(Containers 1A, 1B, and 2)

Oxidized Hg (ug) 0.62
(Containers 3)

Elemental Hg (ug) 0.02
(Containers 4 and 5)

Total Hg (ug) 0.63
(Containers 1A, 1B, 2, 3, 4, and 5)

Dup. Part. Bound Hg (ug) 0.00
(Containers 1A, 1B, and 2)

Dup. Oxidized Hg (ug) 0.63
(Containers 3)

Dup. Elemental Hg (ug) 0.02
(Containers 4 and 5)

Dup. Total Hg (ug) 0.65
(Containers 1A, 1B, 2, 3, 4, and 5)

Notes:
*1 Sample was originally analyzed on 2/25/00. Sample was reprepared to confirm high amount of Hg. Original results were 0.703 ug and 0.729 ug respectively with an RPD of 3.6 %.

* 2 Reagent Blank Corrected.

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

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Sample ID: EPRI-KCPL
Clinton, Missouri

Hg Analysis
Ontario Hydro Method

Reagent Blanks

Collected On: 1/18/00
Collected By: METCO

Container # 7 - 0.1 N HNO_3 Blank
Container # 8 - 1 N KCl Blank
Container # 9 - 5 % HNO_3/10 % H_2O_2 Blank
Container # 10 - H_2SO_4-/$KMnO_4$ Blank
Container # 11 - 10 % Hydroxylamine Sulfate/Sodium Chloride Blank
Container # 12 Filter Blank

	ID	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Triplicate Result	RPD	Units	Flags	Notes
Container # 7	RBKC-7	---	03/03/00	jpp	<0.050	<0.050	<1.0	---	---	ug/L		
Container # 8	RBKC-8	02/25/00	02/25/00	jpp	<0.070	<0.070	<1.0	---	---	ug/L		
Container # 9	RBKC-9	02/28/00	03/03/00	jpp	<0.123	<0.123	<1.0	---	---	ug/L		
Container # 10	RBKC-10	02/24/00	02/24/00	jpp	0.112	0.121	7.7	---	---	ug/L		
Container # 11	RBKC-11	---	03/03/00	jpp	<0.050	<0.050	<1.0	---	---	ug/L		
Container # 12	Thimble	03/02/00	03/03/00	jpp	0.019	0.020	6.3	---	---	ug		Q87
Container # 12	47 mm	03/02/00	03/03/00	jpp	<0.0025	<0.0025	<1.0	---	---	ug		47Q129

Notes: *1 It was not neceassy to analyze a thimble balnk as only the particulate matter was digested.

ASTM D6414-99 Results

TestAmerica
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Sample ID: EPRI-KCPL
Clinton, Missouri
Coal Samples

Hg Analysis
ASTM D6414-99

Collected On: 01/18/2000 for Run 1 and 01/19/2000 for Run 2 and 3
Collected By: METCO

	Digestion Date	Analysis Date	Analyst	Results	Duplicate Result	RPD	Units	Dry Weight (%)	Flags	Notes
Run 1 Composite	2/23/00	2/23/00	jpp	0.089	0.089	<1.0	ug/g	76.3		
Run 2 Composite	2/23/00	2/23/00	jpp	0.107	0.106	<1.0	ug/g	76.1	*2	
Run 3 Composite	2/23/00	2/23/00	jpp	0.103	0.101	2.4	ug/g	77.2	*1	

Notes:
*1 - Sample was analyzed in triplicate. The triplicate result was 0.101 ug/g with an RPD of 3.0 %.
*2 - Sample was spiked. The spike reovery was 99 %.

3601 SOUTH DIXIE DRIVE / DAYTON, OH 45439 / 937-294-6856 / FAX: 937-294-7816

Mercury Sample Train Receipt Record

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
CLINTON, MO
~~UNIT #1~~ 3 8/2 KC

Location ID/Run #
REAGENT BLANKS
UNIT #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 ( )	___ + ___ + ___ = ___.		
3 ( )	___ + ___ + ___ = ___.		
4 ( )	___ + ___ + ___ = ___.		
5 ( )	___ + ___ + ___ = ___.		
7 (1)	50 + – + – = 50.	RB KC-7	
8 (1)	54 + – + – = 54.	RBKC-8	
9 (1)	51 + – + – = 51.	RBKC-9	
10 (1)	50 + – + – = 50.	RBKC-10	
11 (1)	100 + – + – = 100.	RBKC-11	

Filters:

Cont. ID/(#)	Filter ID(s)		
1A ( )			
1B (3)			
12 (3)	478 129, 130, 131 (47 mm)		FILTER BLANKS
	(88 mm)		
	Q87, 88, 89 (Thimble)		THIMBLE BLANKS

Notes: _____

Checked By: ~~SSP~~ /EPK/SSC
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
Clinton, MO

Location ID/Run #
Blank Train
Unit 1 Precipitation East
Inlet Duct

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 ( )	___ + ___ + ___ = ___.		
3 (1)	465 + — + — = 465.	IBTKC-3	
4 (1)	165 + — + — = 165.	IBTKC-4	
5 (1)	490 + — + — = 490.	IBTKC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A ( )			
1B ( )			
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: EPK/SSC/JPP
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPPI - KCPL
Clinton, MO

Location ID/Run #
STACK
Unit #1 BLANK TRAIN

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 ( )	___ + ___ + ___ = ___.		
3 (/)	460 + — + — = 460.	SBTKC-3	
4 (/)	190 + — + — = 190.	SBTKC-4	
5 (/)	510 + — + — = 510.	SBTKC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A ( )			
1B ( )			
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: SSC/JPP/EPK
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
Clinton, MO

Location ID/Run #
Unit Precipitator East Inlet
Run 1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	135 + — + — = 135.	IRIKC-2	
3 (2)	480 + 270 + — = 750.	IRIKC-3 (A+B)	
4 (1)	185 + — + — = 185.	IRIKC-4	
5 (1)	480 + — + — = 480.	IRIKC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q84	IRIKC-1A	
1B (1)	47Q127	IRIKC-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: EPK/SSC/JPP
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KPCL
Clinton, MO

Location ID/Run #
Precipitator East Inlet Duct
Unit #1 Run 2

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	170 + — + — = 170.	IR2KC-2	
3 (2)	430 + 370 + — = 800.	IR2KC-3	
4 (1)	185 + — + — = 185.	IR2KC-4	
5 (1)	490 + — + — = 490.	IR2KC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q92	IR2KC-1A	
1B (1)	47Q135	IR2KC-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: SSC/JPO/EPL
Date: 02/08/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
Clinton, MO

Location ID/Run #
Unit 1 Precipitator East Inlet
Run 3

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	145 + — + — = 145.	IR3KC-2	
3 (2)	490 + 390 + — = 880.	IR3KC-3(A&B)	
4 (1)	180 + — + — = 180.	IR3KC-4	
5 (1)	440 + — + — = 440.	IR3KC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q93	IR3KC-1A	
1B (1)	47Q136	IR3KC-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: CPK/SSC/SPP
Date: 02/08/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
CLINTON, MO

Location ID/Run #
STACK
RUN #1
UNIT #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	110 + — + — = 110.	SRIKC-2	
3 (2)	420 + 390 + — = 810.	SRIKC-3 (ASB)	
4 (1)	175 + — + — = 175.	SRIKC-4	
5 (1)	450 + — + — = 450.	SRIKC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q85	SRIKC-1A	
1B (2)	47Q128, 132	SRIKC-1B	
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes: _____

Checked By: EPK/SSC/JRP
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI - KCPL
CLINTON, MO

Location ID/Run #
STACK
RUN #2
UNIT #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	150 + — + — = 150.	SR2KC-2	
3 (2)	470 + 410 + — = 880.	SR2KC-3 (A+B)	
4 (1)	190 + — + — = 190.	SR2KC-4	
5 (1)	490 + — + — = 490.	SR2KC-5	
7 ( )	___ + ___ + ___ = ___.		
8 ( )	___ + ___ + ___ = ___.		
9 ( )	___ + ___ + ___ = ___.		
10 ( )	___ + ___ + ___ = ___.		
11 ( )	___ + ___ + ___ = ___.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q91		
1B (1)	47Q134		
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: SSC/JRR/EPR
Date: 2/8/00

TestAmerica INCORPORATED

Mercury Sample Train Receipt Record

Client ID
EPRI-KCPL

Location ID/Run #
STACK
RUN #3
UNIT #1

Solutions:

Cont. ID/(#)	Volumes (mL)	TestAmerica ID(s)	Comments
2 (1)	105 + — + — = 105.	SR3KC-2	
3 (2)	490 + 290 + — = 780.	SR3KC-3(A+B)	
4 (1)	185 + — + — = 185.	SR3KC-4	
5 (1)	490 + — + — = 490.	SR3KC-5	
7 ( )	— + — + — = —.		
8 ( )	— + — + — = —.		
9 ( )	— + — + — = —.		
10 ( )	— + — + — = —.		
11 ( )	— + — + — = —.		

Filters:

Cont. ID/(#)	Filter ID(s)		
1A (1)	Q94	SR3KC	
1B (1)	47Q137		
12	(47 mm)		
	(88 mm)		
	(Thimble)		

Notes:

Checked By: SSC/JPB/EPK
Date: 2/8/00

TestAmerica INCORPORATED

Sample Preparation Batch Sheets

KCPL COALS
Clinton, Mo

NONAQUEOUS MERCURY BATCH SHEET

Analyst: SPP Date: 2/23/00 Water Bath: start mid end

Standard Reference: 67-16-15 temp: 80°C

ICV Reference: 67-16-16 date:

Cont #	Sample # / Client	Weight	MS	MSD
B	BLANK	~~1.0047~~ 2/23/00		
1	NIST 1630 A	1.0047	47.8	
2	368 RUN#1	1.1318	44.2	
3	369 RUN#2 SAL	1.0381	48.2	
4	370 RUN#3 TRP	1.0658	46.9	

MB

ICV

MS

MSD

RPD

FLAG

HNO_3 - 6717
HCl - 6775
$KMnO_4$ - 67-
$SnCl_2$ - 67-1

SECONDARY DATA CHECK: analyst:
date:

Comments: NIST 1630A TV = 0.106 ± 0.023 mg/kg V_F = 50 mL
mg/kg

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) SPP Preparation Date 2/24/00

Reagent Reference #'s

HCl	N/A	$SnCl_2$	67-18-17
$NH_2OH*HCl$	67-7-4	Calibration Standards	67-16-15
$KMnO_4$	N/A	ICV Standard	67-16-16
HNO_3	N/A		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	10	RB KC 10	50	NA	NA						
	5	IBT KC 5	490								
	5	IR1 KC 5	480								
	5	IR2 KC 5	490								
	5	IR3 KC 5	440								
	5	SR1 KC 5	450								
	5	SR2 KC 5 TRP	490								
	5	SR3 KC 5 SRL	490								
	5	SBT KC 5	510								

NOTES

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) SAH, EPK, JPP Preparation Date 2/28/00

Reagent Reference #'s

HCl	67-19-2	$SnCl_2$	4723-44
$NH_2OH*HCl$	67-18-18	Calibration Standards	67-16-15
$KMnO_4$	67-19-3	ICV Standard	67-16-16
HNO_3	67-19-1		
H_2SO_4	67-16-10		
$K_2S_2O_8$	67-19-6		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	~~8~~	~~RB AL~~	~~115~~	~~20~~	~~28~~
	2	IR1 AL	160	20	28
	2	IR2 AL	105	20	28
	2	IR3 AL	160	20	28
	2	IR4 AL	43	20	28
	~~2~~	~~SBT AL~~ JPP 2/28/00	~~340~~		
	2	SR1AL	185	20	28
	2	SR2AL	115	20	28
	2	SR3AL	145	20	28
	~~2~~	~~SR4AL~~	~~135~~	~~20~~	~~28~~

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
	~~3~~	~~IBT AL~~	~~410~~	~~20~~	~~28~~
	3	IR1AL	780	20	28
	3	IR2AL	720	20	28
	3	IR3 AL	670	20	28
	3	IR4AL	660	20	28
	3	SBTAL	390	20	28
	3	SR1AL	620	20	28
	3	SR2 AL	537	20	28
	3	SR3 AL	482	20	28
	~~3~~	~~SR4 AL~~	~~521~~	~~20~~	~~28~~
	3	IBTKC *	465	20	28
	3	SBTKC *	460	20	28

NOTES * REPREPS PSD, RUN

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) JPP Preparation Date 2/25/00

Reagent Reference #'s

HCl	~~67-15-1~~ 67-15-1	$SnCl_2$	67-18-21
$NH_2OH*HCl$	67-18-18	Calibration Standards	67-16-15
$KMnO_4$	67-15-3	ICV Standard	67-16-16
HNO_3	67-17-22		
H_2SO_4	67-16-10		
$K_2S_2O_8$	67-9-17		

Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
		NH_2OH BLANK		~~20~~	~~28~~						
	8	RB KC 8	54	20	28						
		~~EBT KC 2~~									
	2	ER1 KC 2	135	20	28						
	2	ER2 KC 2	170	20	28						
	2	ER3 KC 2	145	20	28						
	2	SR1 KC 2	110	20	28						
	2	SR2 KC 2	150	20	28						
	2	SR3 KC 2	105	20	28						
	3	EBT KC 3	465	20	28						
	3	ER1 KC 3	750	20	28						
	3	ER2 KC 3	800	20	28						
	3	ER3 KC 3	880	20	28						
	3	SBT KC 3	460	20	28						
	3	SR1 KC 3	810	20	28						
	3	SR2 KC 3	880	20	28						
	3	SR3 KC 3	780	20	28						

NOTES

Mercury in Flue Gas
Aqueous Preparation Batch Log

Analyst(s) EPK DPP Preparation Date 2/28/00

Reagent Reference #'s

HCl	67-19-2	$SnCl_2$	67-21-24
$NH_2OH*HCl$		Calibration Standards	67-16-15
$KMnO_4$	67-19-3, 67-19-13	ICV Standard	67-16-16
HNO_3	67-19-1		

Volume	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)	Lab ID	Cont. #	Sample Description	Init Cont Vol (mL)	Init Prep Vol (mL)	Final Vol (mL)
61.25		9	RB KC	51	25	+10.0 51.25		7	RB KC	→	→	NA
								11	RB KC	→	→	NA
64.25		4	I BT KC	165	25	+8.0 56.25						
60.25		4	I R1 KC	185	25	+4.0 56.25						
60.25		4	I R2 KC	185	25	+4.0 56.25						
62.75		4	I R3 KC	180	25	+4.0 58.75						
60.25		4	S BT KC	190	25	+4.0 56.25		--				
60.25		4	S R1 KC	175	25	+4.0 56.25						
60.25		4	S R2 KC	190	25	+4.0 56.25						
62.75		4	S R3 KC	185	25	+4.0 58.75						

NOTES KCPL 1BTKC3 AND SBTK3 RERUN WITH FILTERS

Mercury in Flue Gas
Filter Preparation Batch Log

Analyst(s) DY / SAM Preparation Date 3/2/00

Reagent Reference #'s

HCl	67-19-2	$SnCl_2$	67-21-24
$NH_2OH*HCl$	—	Calibration Standards	67-16-15
$KMnO_4$	—	ICV Standard	67-16-16
HNO_3	67-19-1	BORIC ACID	67-21-12
HF	65-27-17, 67-21-14		

Lab ID	Filter ID	Sample Description	Final Vol (mL)
1	Q87		150
2	Q87		↓
3	Q87		↓
4	BLANK		50
5	1633B	0.5268g	50
6	472129		50
7	472127		50
8	Q84	0.5179	50
9	472132		50
10	Q85		150
11	Q85		↓
12	Q85		↓

Lab ID	Filter ID	Sample Description	Final Vol (mL)
1 1213	Q91	24	150
2 1314	Q91	23	↓
3 1415	Q91	22	↓
4 1516	Q94	21	150
5 1617	Q94	20	↓
6 1718	Q94	19	↓
7 1819	Q92	18 0.5247	50
8 1920	Q93	17 0.5169	50
9 2011	472136	16	50
10 2122	472134	15	50
11 2223	472128	14	50
12 2324	472135	13	50

NOTES ICPL 472137 RUN WITH ALL FILTERS

FILTERS 472132 + 472128 RECEIVED TOGETHER IN SAME PETRI DISH, DIGESTED SEPARATELY

TestAmerica

Mercury in Flue Gas
Filter Preparation Batch Log

Analyst(s) SAH/JRP Preparation Date 3/3/00

Reagent Reference #'s

HCl	67-19-2	$SnCl_2$	67-21-24 (3/3/00)
$NH_2OH*HCl$	—	Calibration Standards	67-16-15
$KMnO_4$	—	ICV Standard	67-16-16
HNO_3	67-19-1	$SnCl_2$ (#13-24)	67-23-19 (3/8/00
HF	67-21-14		

Lab ID	Filter ID	Sample Description	Final Vol (mL)	Lab ID	Filter ID	Sample Description	Final Vol (mL)
~~1~~	~~88QA198~~		~~50~~	~~13~~	~~88QB48~~		50
2	47Q137	KCPL RUN 3/3/00	50	14	88QH97	TRP	50
3	BLANK		50	15	88QB47		50
4	1633B	USED 3/8/00 0.5885	50	16	Q96	SPK	150
~~5~~	~~47Q138~~		~~50~~	17	Q96		
6	47Q144		50	18	Q96		
7	47Q143		50	19	Q124		150
8	47Q140		50	20	Q124		
9	Q149		150	21	Q124		
10	Q149			22	Q99		150
11	Q149			23	Q99		
~~12~~	~~88QH198~~		~~50~~	~~24~~	~~Q99~~		

NOTES Filters #13-24 run 3/8/00, 1633B from 3/3/00 used 3/8/00

TestAmerica INCORPORATED

2/23/2000 Analytical Data (Coal)

*** Standard: 1 Rep: 1 Seq: 368 17:07:28 23 Feb 2000 HG

Hg .000 ug/L -21
Ave. Int. = -21 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 369 17:09:51 23 Feb 2000 HG

Hg .050 ug/L 3413
Ave. Int. = 3413 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 370 17:12:14 23 Feb 2000 HG

Hg .200 ug/L 14257
Ave. Int. = 14257 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 371 17:14:39 23 Feb 2000 HG

Hg 1.00 ug/L 68592
Ave. Int. = 68592 S. D. = 0

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 5 Rep: 1 Seq: 372 17:17:24 23 Feb 2000 HG

Hg 2.00 ug/L 131882
Ave. Int. = 131882 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 373 17:25:35 23 Feb 2000 HG

Hg 3.00 ug/L 196430
Ave. Int. = 196430 S. D. = 0

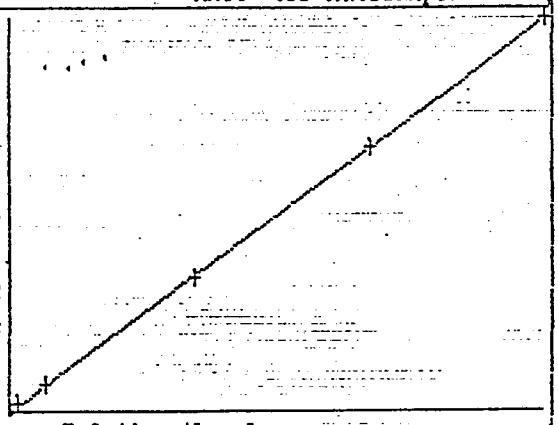
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 17:25:59 23 Feb 2000
Folder: FEB00B Seq: 374 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 29 Gas: 8.23 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted Linear	
S1	.000	-.014	-.014	Quadratic	
S2	.050	.038	-.012	WtdLinear	
S3	.200	.204	.004		C
S4	1.00	1.03	.034	Accept	o
S5	2.00	2.00	.001		n
S6	3.00	2.99	-.013	StdAdd	c

A .0000000 r .999889
B 1.52795e-5 C -1.48304e-2



Relative Absorbance

	Mean	%RSD	
S1	-21	0	-21
S2	3413	0	3413
S3	14257	0	14257
S4	68592	0	68592
S5	131882	0	131882
S6	196430	0	196430

New calibration coefficients stored

```
Protocol: SYSTEST  labsys2
                    Rev: 3.001    Time: 17:29:35  23 Feb 2000
Folder: FEB00B      Seq: 374                     Print: On
User:               Batch:              Id: Std6Rep1   Cup: 1 29 Gas:    0.23 LPM
State: Idle                                            Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022300B
cup id          Extended id          Weight Volume Macro check Help
 1 icb                               1.0000 1.0000
 2 KCPL blk                          1.0000 1.0000
 3 KCPL blk d                        1.0000 1.0000
 4 1630a                             1.0000 1.0000
 5 1630a dup                         1.0000 1.0000
 6 368 #1                            1.0000 1.0000
 7 368#1dup                          1.0000 1.0000
 8 369 #2                            1.0000 1.0000
 9 369#2dup                          1.0000 1.0000
10 369#2spk                          1.0000 1.0000
11 370 #3                            1.0000 1.0000
12 370#3dup                          1.0000 1.0000
13 370#3trp                          1.0000 1.0000
14 ccb                               1.0000 1.0000
15 ccv                               1.0000 1.0000
                                                                          PgDn

Cup 1  ID: icb                                   Cell entry, Ins to switch
```

Line Conc. Units SD/RSD 1 2 3 4 5

*** Check Standard: 2 Ck2 Seq: 374 17:31:19 23 Feb 2000 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 106. .635 .600 ug/L .000 106%

*** Sample ID: icb Seq: 375 17:37:09 23 Feb 2000 HG

Hg -.015 ug/L .000 -.015

*** Sample ID: KCPL blk Seq: 376 17:39:27 23 Feb 2000 HG

Hg .203 ug/L .000 .203 NO DATA.

*** Sample ID: KCPL blk Seq: 377 17:43:55 23 Feb 2000 HG

Hg .026 ug/L .000 .026 <0.05mg/L

*** Sample ID: KCPL blk d Seq: 378 17:46:14 23 Feb 2000 HG

Hg .031 ug/L .000 .031 <0.05mg/L

*** Sample ID: 1630a Seq: 379 17:48:33 23 Feb 2000 HG

Hg 2.28 ug/L .000 2.28 TV=0.106mg/kg ±0.023 0.115mg/kg 108%

*** Sample ID: 1630a dup Seq: 390 17:51:16 23 Feb 2000 HG RPD=<1.0%

Hg 2.26 ug/L .000 2.26 TV=0.106mg/kg ±0.023 0.114mg/kg 107%

*** Sample ID: 368 #1 Seq: 381 17:53:57 23 Feb 2000 HG

Hg 1.53 ug/L .000 1.53 0.089mg/kg

*** Sample ID: 368#1dup Seq: 382 17:56:33 23 Feb 2000 HG RPD=<1.0%

Hg 1.54 ug/L .000 1.54 0.089mg/kg

*** Sample ID: 369 #2 Seq: 383 17:59:12 23 Feb 2000 HG

Hg 1.69 ug/L .000 1.69 0.107mg/kg

*** Sample ID: 369#2dup Seq: 384 18:01:52 23 Feb 2000 HG RPD=<1.0%

Hg 1.68 ug/L .000 1.68 0.106mg/kg

*** Sample ID: 369#2spk Seq: 385 18:04:34 23 Feb 2000 HG

Hg 2.68 ug/L .000 2.68 TV=1.0ug/L 99%

~~0.169mg/kg~~

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 370 #3					Seq: 386	18:07:17 23 Feb 2000 HG		
Hg	1.70	ug/L	.000	1.70		0.103 mg/kg		
*** Sample ID: 370#3dup					Seq: 387	18:09:56 23 Feb 2000 HG RPD=2.4%		
Hg	1.66	ug/L	.000	1.66		0.101 mg/kg		
*** Sample ID: 370#3trp					Seq: 388	18:12:35 23 Feb 2000 HG RPD= 3.0%		
Hg	1.65	ug/L	.000	1.65		0.100 mg/kg		
*** Sample ID: ccb					Seq: 389	18:15:09 23 Feb 2000 HG		
Hg	-.026	ug/L	.000	-.026		< 0.05 mg/L		
*** Sample ID: ccv					Seq: 390	18:17:28 23 Feb 2000 HG		
Hg	2.02	ug/L	.000	2.02		TV=2.00	101%	

2/24/2000 Analytical Data
Run 1

```
*** Standard: 1 Rep: 1                    Seq:  484     18:26:56 24 Feb 2000 HG

Hg     .000     ug/L     -485
                         Ave. Int. =      -485 S. D. =          0

*** Standard: 2 Rep: 1                    Seq:  485     18:29:19 24 Feb 2000 HG

Hg     .050     ug/L     3068
                         Ave. Int. =      3068 S. D. =          0

*** Standard: 3 Rep: 1                    Seq:  486     18:31:43 24 Feb 2000 HG

Hg     .200     ug/L     13573
                         Ave. Int. =     13573 S. D. =          0

*** Standard: 4 Rep: 1                    Seq:  487     18:34:07 24 Feb 2000 HG

Hg     1.00     ug/L     66551
                         Ave. Int. =     66551 S. D. =          0

*** Standard: 5 Rep: 1                    Seq:  488     18:36:47 24 Feb 2000 HG

Hg     2.00     ug/L     131774
                         Ave. Int. =    131774 S. D. =          0

*** Standard: 6 Rep: 1                    Seq:  489     18:42:28 24 Feb 2000 HG

Hg     3.00     ug/L     183622
                         Ave. Int. =    183622 S. D. =          0
```

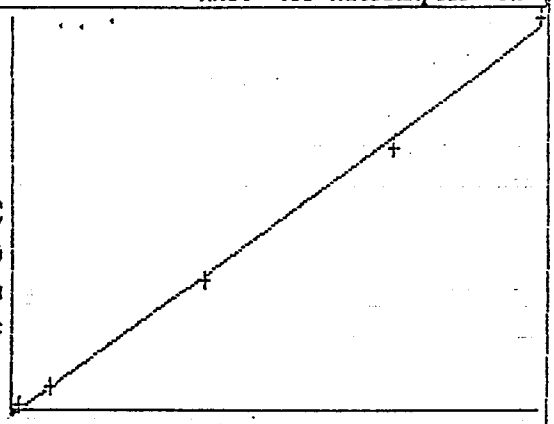
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 18:42:59 24 Feb 2000
Folder: FEB00B Seq: 490 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 27 Gas: 0.23 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	-.029	-.029	Quadratic	
S2	.050	.028	-.022	WtdLinear	
S3	.200	.196	-.004		C
S4	1.00	1.04	.045	Accept	o
S5	2.00	2.09	.090		n
S6	3.00	2.92	-.080	StdAdd	c

A .0000000 r .998820
B 1.60172e-5 C -2.10793e-2



	Mean	%RSD	
S1	-485	0	-485
S2	3068	0	3068
S3	13573	0	13573
S4	66551	0	66551
S5	131774	0	131774
S6	183622	0	183622

New calibration coefficients stored

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 18:49:31  24 Feb 2000
Folder: FEB00B     Seq: 490                     Print: On
User:              Batch:          Id: Std6Reo1   Cup: 1 27 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022400C
cup Id        Extended id          Weight Volume Macro check Help
 1 icb                             1.0000 1.0000
 2 rbkc 10                         1.0000 1.0000
 3 rbkc10dup                       1.0000 1.0000
 4 ibtkc 5                         1.0000 1.0000
 5 ibtkc5dup                       1.0000 1.0000
 6 ir1kc 5 1:10                    1.0000 1.0000
 7 ir1kc5dup 1:10                  1.0000 1.0000
 8 ir2kc 5 1:10                    1.0000 1.0000
 9 ir2kc5dup 1:10                  1.0000 1.0000
10 ir2kc5trp 1:10                  1.0000 1.0000
11 ir3kc 5 1:10                    1.0000 1.0000
12 ir3kc5dup 1:10                  1.0000 1.0000
13 ir3kc5spk 1:10                  1.0000 1.0000
14 ccb                             1.0000 1.0000
15 ccv                             1.0000 1.0000
                                                                    PgDn

Cup 1  ID: icb                          Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 18:49:37  24 Feb 2000
Folder: FEB00B     Seq: 490                    Print: On
User:              Batch:          Id: Std6Rep1   Cup: 1 27 Gas:    0.23 LPM
State: Idle                                     Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack 022400C                                  PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 sr1kc5 1:10                       1.0000 1.0000
17 sr1kc5dup 1:10                    1.0000 1.0000
18 sr2kc 5 1:10                      1.0000 1.0000
19 sr2kc5dup 1:10                    1.0000 1.0000
20 sr2kc5trp 1:10                    1.0000 1.0000
21 sr3kc 5 1:10                      1.0000 1.0000
22 sr3kc5dup 1:10                    1.0000 1.0000
23 sr3kc5spk 1:10                    1.0000 1.0000
24 ccb                               1.0000 1.0000
25 ccv                               1.0000 1.0000
26                                   1.0000 1.0000
27                                   1.0000 1.0000
28                                   1.0000 1.0000
29                                   1.0000 1.0000
30                                   1.0000 1.0000
                                                                         PgDn
```

```
Cup 16 ID: sr1kc5                          Cell entry, Ins to switch
```

Line Conc. Units SD/RSD 1 2 3 4 5

*** Check Standard: 2 Ck2 Seq: 490 18:51:09 24 Feb 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg	H	110.	.660	.600	ug/L	.000

NO DATA

*** Check Standard: 2 Ck2 Seq: 491 18:53:41 24 Feb 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	.634	.600	ug/L	.000

106%

*** Sample ID: icb Seq: 492 18:56:14 24 Feb 2000 HG

Hg -.030 ug/L .000 -.030 <0.05 ug/L

*** Sample ID: rbkc 10 Seq: 493 18:58:32 24 Feb 2000 HG

Hg .124 ug/L .000 .124 NO DATA

*** Sample ID: rbkc10dup Seq: 494 19:00:51 24 Feb 2000 HG

Hg .112 ug/L .000 .112 NO DATA

*** Sample ID: ibtkc 5 Seq: 495 19:03:10 24 Feb 2000 HG

Hg .150 ug/L .000 .150 0.074 ug ~~0.150 ug~~ JAO 3/6 0.019 correct

*** Sample ID: ibtkc5dup Seq: 496 19:05:30 24 Feb 2000 HG RPD = 3.4%

Hg .145 ug/L .000 .145 0.071 ug ~~0.145 ug~~ JAO 3/6 0.016 correct

*** Sample ID: ir1kc 5 Seq: 497 19:07:49 24 Feb 2000 HG

Hg 14.8 ug/L .000 14.8 NO DATA

*** Sample ID: ir1kc 5 1:10 Seq: 498 19:12:42 24 Feb 2000 HG

Hg 1.79 ug/L .000 1.79 ~~8.60 ug~~ JAO 3/3 ~~2.60 ug/L~~ JAO 2/28/00 8.59 ug 8.54 ug correct

*** Sample ID: ir1kc5dup 1:10 Seq: 499 19:15:21 24 Feb 2000 HG RPD = 3.4%

Hg 1.73 ug/L .000 1.73 8.30 ug ~~2.5 ug/L~~ JAO 2/28/00 8.25 ug correct

*** Sample ID: ir2kc 5 1:10 Seq: 500 19:18:02 24 Feb 2000 HG

Hg 1.55 ug/L .000 1.55 7.60 ug 7.55 ug correct

*** Sample ID: ir2kc5dup 1:10 Seq: 501 19:20:42 24 Feb 2000 HG RPD = 3.3%

Hg 1.50 ug/L .000 1.50 7.35 ug 7.30 ug

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ir2kc5trp 1:10					Seq: 502	19:23:22 24 Feb 2000 HG RPD = <1.0%		
Hg	1.54	ug/L	.000	1.54		7.55 µg		7.50 ug correct
*** Sample ID: ir3kc 5 1:10					Seq: 503	19:26:04 24 Feb 2000 HG		
Hg	1.69	ug/L	.000	1.69		7.44 µg		7.39
*** Sample ID: ir3kc5dup 1:10					Seq: 504	19:28:44 24 Feb 2000 HG RPD = 1.2%		
Hg	1.67	ug/L	.000	1.67		7.35 µg		7.30 corr
*** Sample ID: ir3kc5spk 1:10					Seq: 505	19:31:24 24 Feb 2000 HG		
Hg	2.70	ug/L	.000	2.70		TV = 1.0 101%		~~105% OK correct~~ IAD 3
*** Sample ID: rbkc 10					Seq: 506	19:34:14 24 Feb 2000 HG		
Hg	.112	ug/L	.000	.112		0.112 µg/L		
*** Sample ID: rbkc10dup					Seq: 507	19:38:44 24 Feb 2000 HG RPD = 7.7%		
Hg	.121	ug/L	.000	.121		0.121 µg/L		
*** Sample ID: ccb					Seq: 508	19:41:33 24 Feb 2000 HG		
Hg	-.023	ug/L	.000	-.023		<0.05 µg/L		
*** Sample ID: ccv					Seq: 509	19:43:52 24 Feb 2000 HG		
Hg	2.10	ug/L	.000	2.10		TV = 2.0 105%		
*** Sample ID: sr1kc5					Seq: 510	19:46:36 24 Feb 2000 HG		
Hg	14.4	ug/L	.000	14.4		No DATA		
*** Sample ID: sr1kc5 1:10					Seq: 511	19:50:03 24 Feb 2000 HG		7.51 ug
Hg	1.68	ug/L	.000	1.68		7.56 µg		correct
*** Sample ID: sr1kc5dup 1:10					Seq: 512	19:52:42 24 Feb 2000 HG RPD = <1.0%		
Hg	1.67	ug/L	.000	1.67		7.52 µg		7.47 ug correct
*** Sample ID: sr2kc 5 1:10					Seq: 513	19:55:22 24 Feb 2000 HG		
Hg	1.93	ug/L	.000	1.93		9.46 µg		9.41 ug correct

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: sr2kc5dup 1:10				Seq: 514	19:58:03 24 Feb 2000 HG			RPD = 2.1%
Hg	1.89	ug/L	.000	1.89		9.26 µg		9.21 ug corrected
*** Sample ID: sr2kc5trp 1:10				Seq: 515	20:00:48 24 Feb 2000 HG			RPD = <1.0%
Hg	1.92	ug/L	.000	1.92		9.41 µg		9.36 corrected
*** Sample ID: sr3kc 5 1:10				Seq: 516	20:03:28 24 Feb 2000 HG			
Hg	1.88	ug/L	.000	1.88		NO DATA		
*** Sample ID: sr3kc5dup 1:10				Seq: 517	20:06:11 24 Feb 2000 HG			
Hg	1.90	ug/L	.000	1.90		NO DATA		
*** Sample ID: sr3kc5spk 1:10				Seq: 518	20:08:51 24 Feb 2000 HG			
Hg	1.82	ug/L	.000	1.82		NO DATA		
*** Sample ID: ccb				Seq: 519	20:11:33 24 Feb 2000 HG			
Hg	1.79	ug/L	.000	1.79		NO DATA		
*** Sample ID: sr3kc 5 1:10				Seq: 520	20:17:35 24 Feb 2000 HG			
Hg	1.87	ug/L	.000	1.87		9.16 µg		9.11 ug corrected
*** Sample ID: sr3kc5dup 1:10				Seq: 521	20:20:15 24 Feb 2000 HG			RPD = 2.2%
Hg	1.83	ug/L	.000	1.83		8.97 µg		8.92 ug corrected
*** Sample ID: sr3kc5spk 1:10				Seq: 522	20:22:58 24 Feb 2000 HG			
Hg	2.94	ug/L	.000	2.94		TV=1.0 107%		105% ~~corrected~~ JAO
*** Sample ID: ccb				Seq: 523	20:25:48 24 Feb 2000 HG			
Hg	-.034	ug/L	.000	-.034		<0.05 µg/L		
*** Sample ID: ccv				Seq: 524	20:28:08 24 Feb 2000 HG			
Hg	2.10	ug/L	.000	2.10		TV=2.0 105%		

AUTOSAMPLER OFF

2/24/2000 Analytical Data
Run 2

*** Standard: 1 Rep: 1 Seq: 525 20:32:51 24 Feb 2000 HG

Hg .000 ug/L -108
Ave. Int. = -108 S. D. = 0

20:35:14 24 Feb 2000 Folder: FEB00B Page 58
Protocol: SYSTEST labsys2

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 2 Rep: 1 Seq: 526 20:35:14 24 Feb 2000 HG

Hg .050 ug/L 3227
Ave. Int. = 3227 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 527 20:37:37 24 Feb 2000 HG

Hg .200 ug/L 13671
Ave. Int. = 13671 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 528 20:40:01 24 Feb 2000 HG

Hg 1.00 ug/L 66724
Ave. Int. = 66724 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 529 20:42:36 24 Feb 2000 HG

Hg 2.00 ug/L 130949
Ave. Int. = 130949 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 530 20:45:22 24 Feb 2000 HG

Hg 3.00 ug/L 186403
Ave. Int. = 186403 S. D. = 0

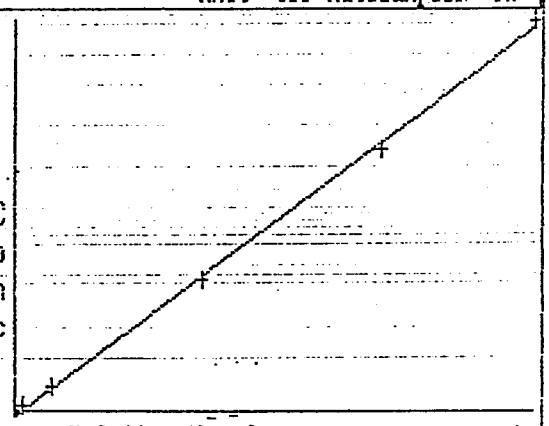
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 20:45:45 24 Feb 2000
Folder: FEB00B Seq: 531 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 25 Gas: 0.23 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	-.022	-.022	Quadratic	
S2	.050	.031	-.019	WtdLinear	
S3	.200	.197	-.003		C
S4	1.00	1.04	.040	Accept	o
S5	2.00	2.06	.061		n
S6	3.00	2.94	-.057	StdAdd	c

A .0000000 r .999368
B 1.58987e-5 C -2.05382e-2



Relative Absorbance

	Mean	%RSD	
S1	-108	0	-108
S2	3227	0	3227
S3	13671	0	13671
S4	66724	0	66724
S5	130949	0	130949
S6	186403	0	186403

New calibration coefficients stored

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 20:50:36  24 Feb 2000
Folder: FEB00B     Seq: 531                    Print: On
User:              Batch:          Id: Std&Rep1   Cup: 1 25 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022400d
cup Id          Extended id          Weight Volume Macro check Help
 1 icb                               1.0000 1.0000
 2 rbal 10                           1.0000 1.0000
 3 rbal10dup                         1.0000 1.0000
 4 ibtal 5                           1.0000 1.0000
 5 ibtal5dup                         1.0000 1.0000
 6 ir1al 5 |:10                      1.0000 1.0000
 7 ir1al5dup |:10                    1.0000 1.0000
 8 ir2al 5 |:10                      1.0000 1.0000
 9 ir2al5dup |:10                    1.0000 1.0000
10 ir3al 5 |:10                      1.0000 1.0000
11 ir3al5dup |:10                    1.0000 1.0000
12 ir3al5trp |:10                    1.0000 1.0000
13 ir4al 5 |:10                      1.0000 1.0000
14 ir4al5dup |:10                    1.0000 1.0000
15 ir4al5spk |:10                    1.0000 1.0000
                                                                    PgDn

Cup 1  ID: icb                                Cell entry, Ins to switch
```

```
Protocol: SYSTEST _ labsys2
                    Rev: 3.001   Time: 22:26:41  24 Feb 2000
Folder: FEB00B      Seq: 565                    Print: On
User:               Batch:            Id: sr4al 5    Cup: 1 23 Gas:    0.23 LPM
State: Idle         Macro AR       not found         Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022400d                                    PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 sr1al 5 1:10                      1.0000 1.0000
17 sr1al5dup 1:10                    1.0000 1.0000
18 sr2al 5 1:10                      1.0000 1.0000
19 sr2al5dup 1:10                    1.0000 1.0000
20 sr3al 5 1:10                      1.0000 1.0000
21 sr3al5dup 1:10                    1.0000 1.0000
22 sr3al5trp 1:10                    1.0000 1.0000
23 sr4al 5 1:10                      1.0000 1.0000
24 sr4al5dup 1:10                    1.0000 1.0000
25 sr4al5spk 1:10                    1.0000 1.0000
26 ccb                               1.0000 1.0000
27 ccv                               1.0000 1.0000
28 sbtal5                            1.0000 1.0000
29 sbtal5dup                         1.0000 1.0000
30 sbtkc 5                           1.0000 1.0000
                                                                            PgDn

Cup 16 ID: sr1al 5                          _Cell entry, Ins to switch
```

SPO

```
Protocol: SYSTEST _labsys2
                    Rev: 3.001    Time: 22:26:47  24 Feb 2000
Folder: FEB00B      Seq: 565                     Print: On
User:               Batch:            Id: sr4al 5    Cup: 1 23 Gas:    0.23 LPM
State: Idle         Macro AR       not found         Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022400d                                    PgUp
cup Id          Extended id          Weight Volume Macro check Help
31 sbtkc5dup                         1.0000 1.0000
32 ccb                               1.0000 1.0000
33 ccv                               1.0000 1.0000
34                                   1.0000 1.0000
35                                   1.0000 1.0000
36                                   1.0000 1.0000
37                                   1.0000 1.0000
38                                   1.0000 1.0000
39                                   1.0000 1.0000
40                                   1.0000 1.0000
41                                   1.0000 1.0000
42                                   1.0000 1.0000
43                                   1.0000 1.0000
44                                   1.0000 1.0000
                                                                          PgDn

Cup 31 ID: sbtkc5dup                          _Cell entry, Ins to switch
```

20:52:23 24 Feb 2000 Folder: FEB00B Page 59
Protocol: SYSTEST labsys2

Line Conc. Units SD/RSD 1 2 3 4 5

*** Check Standard: 2 Ck2 Seq: 531 20:52:23 24 Feb 2000 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 103. .620 .600 ug/L .000

*** Sample ID: icb Seq: 532 20:54:54 24 Feb 2000 HG
Hg -.030 ug/L .000 -.030 <0.05µg/L

*** Sample ID: rbal 10 Seq: 533 20:57:13 24 Feb 2000 HG
Hg -.002 ug/L .000 -.002 <0.05µg/L

*** Sample ID: rbal10dup Seq: 534 20:59:32 24 Feb 2000 HG RPD-N/A
Hg -.007 ug/L .000 -.007 <0.05µg/L

*** Sample ID: ibtal 5 Seq: 535 21:01:51 24 Feb 2000 HG
Hg .071 ug/L .000 .071 0.03µg

*** Sample ID: ibtal5dup Seq: 536 21:04:10 24 Feb 2000 HG RPD=437
Hg .068 ug/L .000 .068 0.030µg

*** Sample ID: ir1al 5 1:10 Seq: 537 21:06:30 24 Feb 2000 HG
Hg .676 ug/L .000 .676 0.399µg x10 = 3.99µg

*** Sample ID: ir1al5dup 1:10 Seq: 538 21:08:56 24 Feb 2000 HG RPD=<1.0%
Hg .673 ug/L .000 .673 0.397µg x10 = 3.97µg

*** Sample ID: ir2al 5 1:10 Seq: 539 21:11:25 24 Feb 2000 HG
Hg .631 ug/L .000 .631 0.284µg x10 = 2.84µg

*** Sample ID: ir2al5dup 1:10 Seq: 540 21:13:55 24 Feb 2000 HG RPD=2.6%
Hg .615 ug/L .000 .615 0.277µg x10 = 2.77µg

*** Sample ID: ir3al 5 1:10 Seq: 541 21:16:25 24 Feb 2000 HG
Hg .684 ug/L .000 .684 0.315µg x10 = 3.15µg

*** Sample ID: ir3al5dup 1:10 Seq: 542 21:18:59 24 Feb 2000 HG RPD=1.6%
Hg .673 ug/L .000 .673 0.310µg x10 = 3.10µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
~~*** Sample ID: ir3al5tro 1:10~~					~~Seq: 543~~	~~21:21:31 24 Feb 2000 HG~~		~~RPD = <1.0~~
Hg	.690	ug/L	.000	.680				3.13 µg
*** Sample ID: ir4al 5 1:10					Seq: 544	21:24:00 24 Feb 2000 HG		
Hg	.698	ug/L	.000	.698				2.86 µg
*** Sample ID: ir4al5dup 1:10					Seq: 545	21:26:29 24 Feb 2000 HG		RPD = 21.0%
Hg	.700	ug/L	.000	.700				2.87 µg
*** Sample ID: ir4al5spk 1:10					Seq: 546	21:28:53 24 Feb 2000 HG		
Hg	1.79	ug/L	.000	1.79		TV = 1.0		109%
*** Sample ID: sr1al 5 1:10					Seq: 547	21:31:27 24 Feb 2000 HG		
Hg	1.12	ug/L	.000	1.12				5.15 µg
*** Sample ID: sr1al5dup 1:10					Seq: 548	21:34:07 24 Feb 2000 HG		RPD = N/A
Hg	1.12	ug/L	.000	1.12				5.15 µg
*** Sample ID: sr2al 5 1:10					Seq: 549	21:36:39 24 Feb 2000 HG		
Hg	1.19	ug/L	.000	1.19				5.12 µg
*** Sample ID: sr2al5dup 1:10					Seq: 550	21:39:20 24 Feb 2000 HG		RPD = 1.7%
Hg	1.17	ug/L	.000	1.17				5.03 µg
*** Sample ID: sr3al 5 1:10					Seq: 551	21:42:00 24 Feb 2000 HG		
Hg	1.32	ug/L	.000	1.32				5.41 µg
*** Sample ID: sr3al5dup 1:10					Seq: 552	21:44:40 24 Feb 2000 HG		RPD = 3.1%
Hg	1.28	ug/L	.000	1.28				5.25 µg
*** Sample ID: sr3al5tro 1:10					Seq: 553	21:47:15 24 Feb 2000 HG		RPD = 1.5%
Hg	1.30	ug/L	.000	1.30				5.33 µg
*** Sample ID: sr4al 5 1:10					Seq: 554	21:49:55 24 Feb 2000 HG		
Hg	1.35	ug/L	.000	1.35				4.86 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: sr4al5dup 1:10				Seq: 565	22:29:19 24 Feb 2000 HG RPD=21.0%			
Hg	1.34	ug/L	.000	1.34				
*** Sample ID: sr4al5spk 1:10				Seq: 566	22:32:00 24 Feb 2000 HG			
Hg	2.26	ug/L	.000	2.26				
*** Sample ID: ccb				Seq: 567	22:34:51 24 Feb 2000 HG			
Hg	-.030	ug/L	.000	-.030		<0.05µg/L		
*** Sample ID: ccv				Seq: 568	22:37:11 24 Feb 2000 HG			
Hg	1.98	ug/L	.000	1.98		N=2.0	99%	
*** Sample ID: sbtal5				Seq: 569	22:39:56 24 Feb 2000 HG			
Hg	.054	ug/L	.000	.054		NO DATA		
*** Sample ID: sbtal5dup				Seq: 570	22:42:16 24 Feb 2000 HG	RPD=12%		
Hg	.061	ug/L	.000	.061		NO DATA		
*** Sample ID: sbtkc 5				Seq: 571	22:44:37 24 Feb 2000 HG		0 ug	
Hg	.100	ug/L	.000	.100		0.044µg	CORRECTE	
*** Sample ID: sbtkc5dup				Seq: 572	22:46:58 24 Feb 2000 HG	RPD=21.0%		
Hg	.100	ug/L	.000	.100		0.044µg	0 ug	
*** Sample ID: ccb				Seq: 573	22:49:19 24 Feb 2000 HG		CORRECTE	
Hg	-.026	ug/L	.000	-.026		<0.05µg/L		
*** Sample ID: ccv				Seq: 574	22:51:39 24 Feb 2000 HG			
Hg	2.02	ug/L	.000	2.02		N=2.0	101%	

2/25/2000 Analytical Data

```
*** Standard: 1 Rep: 1                Seq:  599     19:51:43 25 Feb 2000 HG

Hg     .000     ug/L     -155
                         Ave. Int. =      -155 S. D. =          0

*** Standard: 2 Rep: 1                Seq:  600     19:54:06 25 Feb 2000 HG

Hg     .050     ug/L     3434
                         Ave. Int. =      3434 S. D. =          0

*** Standard: 3 Rep: 1                Seq:  601     19:56:29 25 Feb 2000 HG

Hg     .200     ug/L     13991
                         Ave. Int. =     13991 S. D. =          0

*** Standard: 4 Rep: 1                Seq:  602     19:58:59 25 Feb 2000 HG

Hg     1.00     ug/L     71170
                         Ave. Int. =     71170 S. D. =          0

*** Standard: 5 Rep: 1                Seq:  603     20:01:54 25 Feb 2000 HG

Hg     2.00     ug/L     141707
                         Ave. Int. =    141707 S. D. =          0

*** Standard: 6 Rep: 1                Seq:  604     20:06:18 25 Feb 2000 HG

Hg     3.00     ug/L     219716
                         Ave. Int. =    219716 S. D. =          0
```

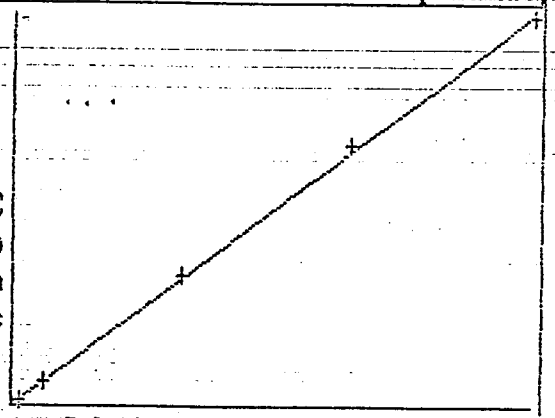
Protocol: SYSTEST labsys2
Rev: 3.001 Time: 20:06:42 25 Feb 2000
Folder: FEB00B Seq: 605 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 33 Gas: 8.23 LPM
State: Idle Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear	
S1	.000	.010	.010	Quadratic	
S2	.050	.059	.009	WtdLinear	
S3	.200	.204	.004		C
S4	1.00	.989	-.011	Accept	o
S5	2.00	1.96	-.042		n
S6	3.00	3.03	.030	StdAdd	c

A .0000000 r .999805
m 1.37370e-5 C 1.17805e-2



Relative Absorbance

	Mean	%RSD	
S1	-155	0	-155
S2	3434	0	3434
S3	13991	0	13991
S4	71170	0	71170
S5	141707	0	141707
S6	219716	0	219716

New calibration coefficients stored

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 20:23:03  25 Feb 2000
Folder: FEB00B     Seq: 605                    Print: On
User:              Batch:            Id: Std6Rep1   Cup: 1 33 Gas:    0.23 LPM
State: Idle                                     Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022500D
cup Id          Extended id          Weight Volume Macro check Help
 1 icb                               1.0000 1.0000
 2 kcpl blk                          1.0000 1.0000
 3 kcplblkdup                        1.0000 1.0000
 4 NH2OHblk                          1.0000 1.0000
 5 NH2OHdup                          1.0000 1.0000
 6 rbkc 8                            1.0000 1.0000
 7 rbkc 8dup                         1.0000 1.0000
 8 ir1kc 2                           1.0000 1.0000
 9 ir1kc2dup                         1.0000 1.0000
10 ir2kc 2 repeat                    1.0000 1.0000
11 ir2kc2dup repeat                  1.0000 1.0000
12 ir3kc 2                           1.0000 1.0000
13 ir3kc2dup                         1.0000 1.0000
14 sr1kc 2 Repeat                    1.0000 1.0000
15 sr1kc2dup Repeat                  1.0000 1.0000
                                                                    PgDn

Cup 1  ID: icb                                  Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 20:23:08  25 Feb 2000
Folder: FEB00B     Seq: 605                     Print: On
User:              Batch:              Id: Std6Rep1   Cup: 1 33 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022500D                                    PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 sr2kc 2                           1.0000 1.0000
17 sr2kc2dup                         1.0000 1.0000
18 sr2kc2trp                         1.0000 1.0000
19 sr3kc2                            1.0000 1.0000
20 sr3kc2dup                         1.0000 1.0000
21 sr3kc2spk                         1.0000 1.0000
22 ccb                               1.0000 1.0000
23 ccv                               1.0000 1.0000
24 ibtkc 3                           1.0000 1.0000
25 ibtkc3dup                         1.0000 1.0000
26 ir1kc 3                           1.0000 1.0000
27 ir1kc3dup                         1.0000 1.0000
28 ir2kc 3 1.2                       1.0000 1.0000
29 ir2kc3dup 1.2                     1.0000 1.0000
30 ir3kc 3 1.2                       1.0000 1.0000
                                                                           PgDn
Cup 16 ID: sr2kc 2                                   Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 20:23:11  25 Feb 2000
Folder: FEB00B     Seq: 605                    Print: On
User:              Batch:            Id: Std&Rep1   Cup: 1 33 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 022500D                                    PgUp
Cup Id          Extended id          Weight Volume Macro check Help
31 ir3kc3dup 1:2                     1.0000 1.0000
32 sbtkc 3 repeat KPD                1.0000 1.0000
33 sbtkc3dup repeat KPD              1.0000 1.0000
34 sr1kc 3 1:2                       1.0000 1.0000
35 sr1kc3dup 1:2                     1.0000 1.0000
36 sr2kc 3 1:2                       1.0000 1.0000
37 sr2kc3dup 1:2                     1.0000 1.0000
38 sr2kc3trp 1:2                     1.0000 1.0000
39 sr3kc 3 1:2                       1.0000 1.0000
40 sr3kc3dup 1:2                     1.0000 1.0000
41 sr3kc3spk 1:5, 1:2                1.0000 1.0000
42 ccb                               1.0000 1.0000
43 ccv                               1.0000 1.0000
44                                   1.0000 1.0000
                                                                          PgDn

Cup 31 ID: ir3kc3dup                          Cell entry, Ins to switch
```

*** Check Standard: 2 Ck2 Seq: 606 20:31:55 25 Feb 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		107.	.641	.600	ug/L	.000

*** Sample ID: icb Seq: 607 20:34:51 25 Feb 2000 HG

Hg -.004 ug/L .000 -.004 <0.05µg/L

*** Sample ID: kcpl blk Seq: 608 20:37:10 25 Feb 2000 HG

Hg .016 ug/L .000 .016 <0.05µg/L

*** Sample ID: kcplblkdup Seq: 609 20:39:29 25 Feb 2000 HG

Hg .016 ug/L .000 .016 <0.05µg/L

*** Sample ID: NH2OHblk Seq: 610 20:41:48 25 Feb 2000 HG

Hg .013 ug/L .000 .013 <0.05µg/L

*** Sample ID: NH2OHdup Seq: 611 20:44:07 25 Feb 2000 HG

Hg .013 ug/L .000 .013 <0.05µg/L

*** Sample ID: rbkc 8 Seq: 612 20:46:26 25 Feb 2000 HG

Hg .011 ug/L .000 .011 ~~<0.05µg~~ <0.07
JAD 3/6

*** Sample ID: rbkc 8dup Seq: 613 20:48:45 25 Feb 2000 HG RPD <1.0

Hg .012 ug/L .000 .012 ~~<0.05µg~~ <0.07
JAD 3/6

*** Sample ID: ir1kc 2 Seq: 614 20:51:04 25 Feb 2000 HG

Hg .205 ug/L .000 .205 0.039µg

*** Sample ID: ir1kc2dup Seq: 615 20:53:37 25 Feb 2000 HG RPD=7.62

Hg .190 ug/L .000 .190 0.036µg

*** Sample ID: ir2kc 2 Seq: 616 20:56:14 25 Feb 2000 HG

Hg .045 ug/L .000 .045 NO DATA
RPD OUT

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: ir2kc2dup Seq: 617 21:00:31 25 Feb 2000 HG

Hg .055 ug/L .000 .055 NO DATA, RPD OUT

*** Sample ID: ir3kc 2 Seq: 618 21:02:50 25 Feb 2000 HG

Hg .209 ug/L .000 .209 0.042 µg

*** Sample ID: ir3kc2dup Seq: 619 21:05:29 25 Feb 2000 HG RPD = <1.0 %

Hg .207 ug/L .000 .207 0.042 µg

*** Sample ID: sr1kc 2 Seq: 620 21:08:05 25 Feb 2000 HG

Hg .061 ug/L .000 .061 NO DATA RPD OUT

*** Sample ID: sr1kc2dup Seq: 621 21:10:26 25 Feb 2000 HG

Hg .053 ug/L .000 .053 NO DATA RPD OUT

*** Sample ID: sr2kc 2 Seq: 622 21:12:47 25 Feb 2000 HG

Hg .030 ug/L .000 .030 <0.011 µg

*** Sample ID: sr2kc2dup Seq: 623 21:15:06 25 Feb 2000 HG RPD = <1.0 %

Hg .036 ug/L .000 .036 <0.011 µg

*** Sample ID: sr2kc2trp Seq: 624 21:17:25 25 Feb 2000 HG RPD = <1.0 %

Hg .037 ug/L .000 .037 <0.011 µg

*** Sample ID: sr3kc2 Seq: 625 21:19:45 25 Feb 2000 HG

Hg .038 ug/L .000 .038 <0.007 µg

*** Sample ID: sr3kc2dup Seq: 626 21:22:04 25 Feb 2000 HG RPD = <1.0 %

Hg .038 ug/L .000 .038 <0.007 µg

*** Sample ID: sr3kc2spk Seq: 627 21:24:23 25 Feb 2000 HG

Hg .037 ug/L .000 .037 NO DATA

*** Sample ID: sr3kc2spk Seq: 628 21:28:38 25 Feb 2000 HG

Hg 1.16 ug/L .000 1.16 TV = 1.0 µg/L 116%

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: ir2kc 2 ~~REPEAT~~ OK JAO 3/3 Seq: 629 21:31:54 25 Feb 2000 HG

Hg .039 ug/L .000 .039 <0.012 µg

*** Sample ID: ir2kc2dup ~~REPEAT~~ OK JAO 3/3 Seq: 630 21:34:14 25 Feb 2000 HG RPD-- NA

Hg .043 ug/L .000 .043 <0.012 µg

*** Sample ID: sr1kc 2 REPEAT Seq: 631 21:39:37 25 Feb 2000 HG

Hg .068 ug/L .000 .068 NO DATA

*** Sample ID: sr1kc2dup REPEAT Seq: 632 21:42:01 25 Feb 2000 HG

Hg .053 ug/L .000 .053 NO DATA

*** Sample ID: sr1kc 2 Seq: 633 21:44:29 25 Feb 2000 HG

Hg .056 ug/L .000 .056 ~~<0.009 µg~~ JAO 3/3 0.009 µg

*** Sample ID: sr1kc2dup Seq: 634 21:46:51 25 Feb 2000 HG RPD-5.5%

Hg .053 ug/L .000 .053 ~~<0.009 µg~~ JAO 3/3 0.008 µg

*** Sample ID: ccb Seq: 635 21:51:17 25 Feb 2000 HG

Hg .011 ug/L .000 .011 <0.050 µg 1L

*** Sample ID: ccv Seq: 636 21:53:37 25 Feb 2000 HG

Hg 2.10 ug/L .000 2.10 TV=2.0 105%

*** Sample ID: ibtkc 3 Rpt rep + rerun Seq: 637 21:57:09 25 Feb 2000 HG

Hg 1.08 ug/L .000 1.08 0.703 µg ~~1.08 µg 1L~~ JAO 3/1/00

*** Sample ID: ibtkc3dup Seq: 638 22:00:13 25 Feb 2000 HG RPD = 3.6%

Hg 1.12 ug/L .000 1.12 0.729 µg ~~1.12 µg 1L~~ JAO 3/1/00

*** Sample ID: ir1kc 3 Seq: 639 22:03:19 25 Feb 2000 HG

Hg 2.51 ug/L .000 2.51 2.64 µg

*** Sample ID: ir1kc3dup Seq: 640 22:06:50 25 Feb 2000 HG RPD = 1.6%

Hg 2.47 ug/L .000 2.47 2.59 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ir2kc 3					Seq: 641	22:10:17 25 Feb 2000 HG		
Hg	3.17	ug/L	.000	3.17		NO DATA		
*** Sample ID: ibtkc 3 Reprep + Rerun					Seq: 642	22:14:01 25 Feb 2000 HG		
Hg	1.10	ug/L	.000	1.10		0.716 µg		
*** Sample ID: ibtkc3dup					Seq: 643	22:17:07 25 Feb 2000 HG RPD = 21.0		
Hg	1.11	ug/L	.000	1.11		0.722 µg		
*** Sample ID: ir2kc 3 1:2					Seq: 644	22:20:13 25 Feb 2000 HG		
Hg	1.74	ug/L	.000	1.74		3.90 ~~1.95~~ µg JAO 3/3		
*** Sample ID: ir2kc3dup 1:2					Seq: 645	22:23:36 25 Feb 2000 HG RPD = 3.5		
Hg	1.68	ug/L	.000	1.68		3.76 ~~1.88~~ µg JAO 3/3		
*** Sample ID: ir3kc 3					Seq: 646	22:26:59 25 Feb 2000 HG		
Hg	3.47	ug/L	.000	3.47		NO DATA		
*** Sample ID: ir3kc 3 1:2					Seq: 647	22:30:53 25 Feb 2000 HG		
Hg	1.84	ug/L	.000	1.84		4.53 ~~2.27~~ µg JAO 3/3		
*** Sample ID: ir3kc3dup 1:2					Seq: 648	22:34:14 25 Feb 2000 HG RPD = <1.0%		
Hg	1.85	ug/L	.000	1.85		4.56 ~~2.28~~ µg JAO 3/3		
*** Sample ID: sbtkc 3 Reprep + Rerun					Seq: 649	22:37:40 25 Feb 2000 HG		
Hg	.077	ug/L	.000	.077		NO DATA		
*** Sample ID: sbtkc3dup					Seq: 650	22:40:11 25 Feb 2000 HG RPD = 13.3 ?		
Hg	.088	ug/L	.000	.088		NO DATA		
*** Sample ID: sbtkc 3					Seq: 651	22:43:54 25 Feb 2000 HG		
Hg	.096	ug/L	.000	.096		NO DATA		
*** Sample ID: sbtkc3dup					Seq: 652	22:46:20 25 Feb 2000 HG		
Hg	-.003	ug/L	.000	-.003		NO DATA, OUT OF SOLN.		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: sbtkc 3 Reprep + ReNA					Seq: 653	22:48:50 25 Feb 2000 HG		
Hg	.097	ug/L	.000	.097		NO DATA, RPD > 10%		
*** Sample ID: sbtkc3dup					Seq: 654	22:51:20 25 Feb 2000 HG		
Hg	.086	ug/L	.000	.086		NO DATA RPD > 10%		
*** Sample ID: sbtkc 3					Seq: 655	22:54:23 25 Feb 2000 HG		
Hg	.096	ug/L	.000	.096		NO DATA		
*** Sample ID: sbtkc3dup					Seq: 656	22:56:55 25 Feb 2000 HG RPD = 11%		
Hg	.086	ug/L	.000	.086		NO DATA RPD > 10%		
*** Sample ID: sr1kc 3					Seq: 657	22:59:27 25 Feb 2000 HG		
Hg	3.13	ug/L	.000	3.13		NO DATA		
*** Sample ID: sr1kc3dup					Seq: 658	23:03:03 25 Feb 2000 HG		
Hg	2.96	ug/L	.000	2.96		NO DATA		
*** Sample ID: sr1kc 3 1:2					Seq: 659	23:06:36 25 Feb 2000 HG		
Hg	1.56	ug/L	.000	1.56		3.54 µg		
*** Sample ID: sr1kc3dup 1:2					Seq: 660	23:09:58 25 Feb 2000 HG RPD = 4%		
Hg	1.57	ug/L	.000	1.57		3.56 µg		
*** Sample ID: sr2kc 3					Seq: 661	23:13:22 25 Feb 2000 HG		
Hg	3.23	ug/L	.000	3.23		NO DATA		
*** Sample ID: sr2kc 3 1:2					Seq: 662	23:18:52 25 Feb 2000 HG		
Hg	1.68	ug/L	.000	1.68		4.14 µg		
*** Sample ID: sr2kc3dup 1:2					Seq: 663	23:22:09 25 Feb 2000 HG RPD = 2.9%		
Hg	1.73	ug/L	.000	1.73		4.26 µg		
*** Sample ID: sr2kc3tro 1:2					Seq: 664	23:25:27 25 Feb 2000 HG RPD = 1.8%		
Hg	1.71	ug/L	.000	1.71		4.21 µg		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: sr3kc 3					Seq: 665	23:28:46 25 Feb 2000 HG		
Hg	3.22	ug/L	.000	3.22		NO DATA		
*** Sample ID: sr3kc 3 1:2					Seq: 666	23:33:09 25 Feb 2000 HG		
Hg	1.70	ug/L	.000	1.70		3.71 ug		
*** Sample ID: sr3kc3dup 1:2					Seq: 667	23:36:37 25 Feb 2000 HG RPD = N/A		
Hg	1.70	ug/L	.000	1.70		3.71 ug		
*** Sample ID: sr3kc3spk 1:5					Seq: 668	23:40:03 25 Feb 2000 HG		
Hg	1.91	ug/L	.000	1.91		TV = 1.0 94%		OK 1:2 DILUTION
*** Sample ID: sr3kc3spk 1:2					Seq: 669	23:45:03 25 Feb 2000 HG		
Hg	2.58	ug/L	.000	2.58		TV = 1.0 88%		
*** Sample ID: ccb					Seq: 670	23:48:36 25 Feb 2000 HG		
Hg	-.008	ug/L	.000	-.008		<0.05		
*** Sample ID: ccv					Seq: 671	23:50:58 25 Feb 2000 HG		
Hg	2.24	ug/L	.000	2.24		TV = 2.0 112%		

3/3/2000 Analytical Data

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 1 Rep: 1 Seq: 316 09:47:52 03 Mar 2000 HG

Hg .000 ug/L 466
Ave. Int. = 466 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 317 09:50:15 03 Mar 2000 HG

Hg .050 ug/L 6818
Ave. Int. = 6818 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 318 09:52:38 03 Mar 2000 HG

Hg .200 ug/L 28591
Ave. Int. = 28591 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 319 09:55:02 03 Mar 2000 HG

Hg 1.00 ug/L 134408
Ave. Int. = 134408 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 320 09:57:40 03 Mar 2000 HG

Hg 2.00 ug/L 265560
Ave. Int. = 265560 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 321 10:00:30 03 Mar 2000 HG

Hg 3.00 ug/L 408720
Ave. Int. = 408720 S. D. = 0

Protocol: SYSTEST labsys2
Rev: 3.001 Time: 10:01:52 03 Mar 2000
Folder: MARA00 Seq: 322 Print: On
User: Batch: Id: Std6Rep1 Cup: 1 17 Gas: 0.23 LPM
State: Idle Xmit: Off Autosampler: On

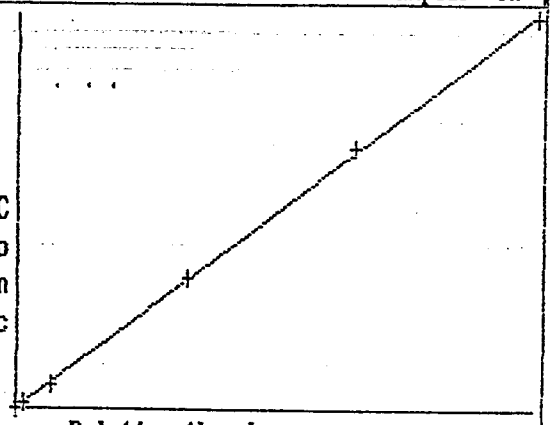
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted	
S1	.000	.004	.004	LiNear	
S2	.050	.051	.001	Quadratic	
S3	.200	.212	.012	WtdLinear	
S4	1.00	.995	-.005		C
S5	2.00	1.96	-.035	Accept	o
S6	3.00	3.02	.024		n
				StdAdd	c

A .0000000 r .999868
B 7.39699e-6 C 4.62402e-4

	Mean	%RSD	
S1	466	0	466
S2	6818	0	6818
S3	28591	0	28591
S4	134400	0	134400
S5	265560	0	265560
S6	408720	0	408720



New calibration coefficients stored

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 11:06:40  03 Mar 2000
Folder: MARA00     Seq: 326                    Print: On
User:              Batch:            Id: REKC 7     Cup: 1 03 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 030300C
cup Id          Extended id      Weight Volume Macro check Help
 1 ICB                           1.0000 1.0000
 2 BLK                           1.0000 1.0000
 3 BLKDUP                        1.0000 1.0000
 4 REKC 7                        1.0000 1.0000
 5 REKC7DUP                      1.0000 1.0000
 6 REKC 11                       1.0000 1.0000
 7 REKC11DUP                     1.0000 1.0000
 8 REKC 9                        1.0000 1.0000
 9 REKC9DUP                      1.0000 1.0000
10 IBTKC 4                       1.0000 1.0000
11 IBTKC4DUP                     1.0000 1.0000
12 IR1KC 4 RPD                   1.0000 1.0000
13 IR1KC4DUP RPD                 1.0000 1.0000
14 IR2KC 4                       1.0000 1.0000
15 IR2KC4DUP                     1.0000 1.0000 --
                                                                    PgDn

Cup 1  ID: ICB                                  Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 11:06:45  03 Mar 2000
Folder: MARA00     Seq: 326                    Print: On
User:              Batch:            Id: REKC 7     Cup: 1 03 Gas:    0.23 LPM
State: Idle                                     Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 030300C                                    PgUp
cup Id        Extended id      Weight Volume Macro check Help
16 IR2KC4TRP                   1.0000 1.0000
17 IR3KC 4                     1.0000 1.0000
18 IR3KC4DUP                   1.0000 1.0000
19 IR3KC4SPK                   1.0000 1.0000
20 CCB                         1.0000 1.0000
21 CCV                         1.0000 1.0000
22 SBTKC 4                     1.0000 1.0000
23 SBTKC4DUP                   1.0000 1.0000
24 SR1KC 4                     1.0000 1.0000
25 SR1KC4DUP                   1.0000 1.0000
26 SR2KC 4                     1.0000 1.0000
27 SR2KC4DUP                   1.0000 1.0000
28 SR2KC4TRP                   1.0000 1.0000
29 SR3KC 4                     1.0000 1.0000
30 SR3KC4DUP                   1.0000 1.0000
                                                                           PgDn

Cup 16 ID: IR2KC4TRP                          Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 11:06:47  03 Mar 2000
Folder: MARA00     Seq: 326                     Print: On
User:              Batch:            Id: REKC 7     Cup: 1 03 Gas:    0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On
```

AUTOSAMPLER: Rack entry Rack 030300C PgUp

cup	Id	Extended id	Weight	Volume	Macro	check	Help
31	SR3KC4SPK		1.0000	1.0000			
32	CCB		1.0000	1.0000			
33	CCV		1.0000	1.0000			
34			1.0000	1.0000			
35			1.0000	1.0000			
36			1.0000	1.0000			
37			1.0000	1.0000			
38			1.0000	1.0000			
39			1.0000	1.0000			
40			1.0000	1.0000			
41			1.0000	1.0000			
42			1.0000	1.0000			
43			1.0000	1.0000			
44			1.0000	1.0000			

PgDn

Cup 31 ID: SR3KC4SPK Cell entry, Ins to switch

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 13:08:10  03 Mar 2000
Folder: MARA00     Seq: 365                     Print: On
User:              Batch:            Id: CCV      Cup: 1 33 Gas:   0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On
```

AUTOSAMPLER: Rack entry Rack 030300D

cup	Id	Extended id	Weight	Volume	Macro	check	Help
1	ICB		1.0000	1.0000			
2	BLK		1.0000	1.0000			
3	BLK DUP		1.0000	1.0000			
4	1633 B		1.0000	1.0000			
5	1633BDUP		1.0000	1.0000			
6	Q 87		1.0000	1.0000			
7	Q87 DUP		1.0000	1.0000			
8	47 Q 129		1.0000	1.0000			
9	47Q129DUP		1.0000	1.0000			
10	47 Q 127		1.0000	1.0000			
11	47Q127DUP		1.0000	1.0000			
12	Q 84	1:5	1.0000	1.0000			
13	Q 84DUP	1:5	1.0000	1.0000			
14	47 Q 132		1.0000	1.0000			
15	47Q132DUP		1.0000	1.0000			

PgDn

Cup 1 ID: ICB Cell entry, Ins to switch

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001    Time: 13:08:15  03 Mar 2000
Folder: MARA00     Seq: 365                     Print: On
User:              Batch:            Id: CCV      Cup: 1 33 Gas:   0.23 LPM
State: Idle                                       Xmit: Off Autosampler: On

AUTOSAMPLER:  Rack entry   Rack 030300D                                  PgUp
cup Id          Extended id          Weight Volume Macro check Help
16 47Q132TRP                         1.00000 1.00000
17 Q 85                              1.00000 1.00000
18 Q85DUP                            1.00000 1.00000
19 Q85SPK                            1.00000 1.00000
20 CCB                               1.00000 1.00000
21 CCV                               1.00000 1.00000
22 Q91                               1.00000 1.00000
23 Q91 DUP                           1.00000 1.00000
24 Q 94                              1.00000 1.00000
25 Q 94DUP                           1.00000 1.00000
26 Q 92                              1.00000 1.00000
27 Q 92DUP                           1.00000 1.00000
28 Q 93        1:5                   1.00000 1.00000
29 Q 93DUP     1:5                   1.00000 1.00000
30 47 Q 136                          1.00000 1.00000
                                                                         PgDn

Cup 16 ID: 47Q132TRP                          Cell entry, Ins to switch
```

```
Protocol: SYSTEST  labsys2
                   Rev: 3.001   Time: 13:08:17  03 Mar 2000
Folder: MARA00     Seq: 365                    Print: On
User:              Batch:            Id: CCV       Cup: 1 33 Gas:   0.23 LPM
State: Idle                                        Xmit: Off Autosampler: On
```

AUTOSAMPLER: Rack entry Rack 030300D PgUp

cup	Id	Extended id	Weight	Volume	Macro	check	Help
31	47Q136DUP		1.0000	1.0000			
32	47 Q 134		1.0000	1.0000			
33	47Q134DUP		1.0000	1.0000			
34	47 Q 128		1.0000	1.0000			
35	47Q128DUP		1.0000	1.0000			
36	47Q128TRP		1.0000	1.0000			
37	47 Q 135		1.0000	1.0000			
38	47Q135DUP		1.0000	1.0000			
39	47Q135SPK		1.0000	1.0000			
40	CCB		1.0000	1.0000			
41	CCV		1.0000	1.0000			
42	IBTKC 3		1.0000	1.0000			
43	IBTKC3 DUP		1.0000	1.0000			
44	SBTKC3		1.0000	1.0000			
45	SBTKC3 DUP						
46	CCB						
47	CCV						

PgDn

Cup 31 ID: 47Q136DUP Cell entry, Ins to switch

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2 Seq: 322 10:21:14 03 Mar 2000 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		108.	.650	.600	ug/L	.000

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ICB					Seq: 326	11:08:24 03 Mar 2000 HG		
Hg	.008	ug/L	.000	.008			<0.05 mg/L	
*** Sample ID: BLK					Seq: 327	11:10:43 03 Mar 2000 HG		
Hg	.091	ug/L	.000	.091		NO DATA		
*** Sample ID: BLKDUP					Seq: 328	11:13:02 03 Mar 2000 HG		
Hg	.091	ug/L	.000	.091				
*** Sample ID: REKC 7					Seq: 329	11:15:21 03 Mar 2000 HG		
Hg	.002	ug/L	.000	.002			<0.05 mg/L	
*** Sample ID: REKC7DUP					Seq: 330	11:17:40 03 Mar 2000 HG RPD = N/A		
Hg	.002	ug/L	.000	.002			<0.05 mg/L	
*** Sample ID: REKC 11					Seq: 331	11:19:59 03 Mar 2000 HG		
Hg	.003	ug/L	.000	.003			<0.05 mg/L	
*** Sample ID: REKC11DUP					Seq: 332	11:22:18 03 Mar 2000 HG RPD = N/A		
Hg	.005	ug/L	.000	.005			<0.05 mg/L	
*** Sample ID: REKC 9					Seq: 333	11:24:37 03 Mar 2000 HG		
Hg	.002	ug/L	.000	.002			<0.123 µg/L	
*** Sample ID: REKC9DUP					Seq: 334	11:26:56 03 Mar 2000 HG RPD = N/A		
Hg	.003	ug/L	.000	.003			<0.123 µg/L	
*** Sample ID: IBTKC 4					Seq: 335	11:29:15 03 Mar 2000 HG		
Hg	.046	ug/L	.000	.046			<0.02 µg	
*** Sample ID: IBTKC4DUP					Seq: 336	11:31:34 03 Mar 2000 HG RPD = N/A		
Hg	.034	ug/L	.000	.034			<0.02 µg	
*** Sample ID: IR1KC 4					Seq: 337	11:33:53 03 Mar 2000 HG		
Hg	.082	ug/L	.000	.082			NO DATA	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: IR1KC4DUP					Seq: 338	11:36:14 03 Mar 2000 HG		
Hg	.074	ug/L	.000	.074				
*** Sample ID: IR1KC 4					Seq: 339	11:46:33 03 Mar 2000 HG		
Hg	.079	ug/L	.000	.079				
*** Sample ID: IR1KC4DUP					Seq: 340	11:48:53 03 Mar 2000 HG		
Hg	.066	ug/L	.000	.066				
*** Sample ID: IR2KC 4					Seq: 341	11:51:16 03 Mar 2000 HG		
Hg	.118	ug/L	.000	.118				
*** Sample ID: IR2KC4DUP					Seq: 342	11:53:46 03 Mar 2000 HG		
Hg	.114	ug/L	.000	.114				
*** Sample ID: IR2KC4TRP					Seq: 343	11:56:15 03 Mar 2000 HG		
Hg	.120	ug/L	.000	.120				
*** Sample ID: IR3KC 4					Seq: 344	11:58:47 03 Mar 2000 HG		
Hg	.107	ug/L	.000	.107				
*** Sample ID: IR3KC4DUP					Seq: 345	12:01:09 03 Mar 2000 HG		
Hg	.097	ug/L	.000	.097				
*** Sample ID: IR3KC4SPK					Seq: 346	12:03:38 03 Mar 2000 HG		
Hg	.929	ug/L	.000	.929				
*** Sample ID: CCB					Seq: 347	12:06:27 03 Mar 2000 HG		
Hg	-.010	ug/L	.000	-.010				
*** Sample ID: CCV					Seq: 348	12:08:47 03 Mar 2000 HG		
Hg	1.92	ug/L	.000	1.92				
*** Sample ID: SBTKC 4					Seq: 349	12:11:29 03 Mar 2000 HG		
Hg	.069	ug/L	.000	.069				

RPD=10.2%

NODATA

NODATA

RPD=11%

NODATA

RPD = 3.4 / 3.1 5.3

0.053 mg

~~0.054 µg~~ ~~0.053 µg/L~~ DMP 5/4 3.3

RPD = 5.3 / 1.7

0.051 µg

~~0.053 µg~~ ~~0.051 mg~~ DMP 3/13/00

0.054 µg

RPD = 9.8%

0.048 µg

0.044 µg

TV=1.0

82%

< 0.05 mg/L

96 %

0.032 µg

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: SBTKC4DUP				-Seq:	350	12:13:49 03 Mar 2000 HG RPD = 4.4 %		
Hg	.066	ug/L	.000	.066		0.030 µg		
*** Sample ID: SR1KC 4				Seq:	351	12:16:09 03 Mar 2000 HG		
Hg	.077	ug/L	.000	.077		0.032 µg		
*** Sample ID: SR1KC4DUP				Seq:	352	12:18:29 03 Mar 2000 HG RPD = 1.3 %		
Hg	.076	ug/L	.000	.076		0.032 µg		
*** Sample ID: SR2KC 4				Seq:	353	12:20:49 03 Mar 2000 HG		
Hg	.095	ug/L	.000	.095		0.044 µg		
*** Sample ID: SR2KC4DUP				Seq:	354	12:23:25 03 Mar 2000 HG RPD = 4.3 %		
Hg	.091	ug/L	.000	.091		0.042 µg		
*** Sample ID: SR2KC4TRP				Seq:	355	12:25:58 03 Mar 2000 HG RPD = 2.1 %		
Hg	.093	ug/L	.000	.093		0.043 µg		
*** Sample ID: SR3KC 4				Seq:	356	12:28:25 03 Mar 2000 HG		
Hg	.078	ug/L	.000	.078		0.036 µg		
*** Sample ID: SR3KC4DUP				Seq:	357	12:30:55 03 Mar 2000 HG RPD = 2.6 %		
Hg	.076	ug/L	.000	.076		0.035 µg		
*** Sample ID: SR3KC4SPK				Seq:	358	12:33:27 03 Mar 2000 HG		
Hg	.940	ug/L	.000	.940		TV = 1.0 86%		
*** Sample ID: CCB				Seq:	359	12:36:18 03 Mar 2000 HG		
Hg	-.010	ug/L	.000	-.010		<0.05 µg/L		
*** Sample ID: CCV				Seq:	360	12:38:38 03 Mar 2000 HG		
Hg	1.90	ug/L	.000	1.90		TV = 2.0 95%		
*** Sample ID: IR1KC 4 The Repeat for RPD				Seq:	361	12:50:32 03 Mar 2000 HG		
Hg	.070	ug/L	.000	.070		0.031 µg		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: IR1KC4DUP					Seq: 362	12:52:50 03 Mar 2000 HG RPD=2.9%		
Hg	.068	ug/L	.000	.068		0.030 µg		
*** Sample ID: CCB					Seq: 363	12:55:11 03 Mar 2000 HG		
Hg	-.008	ug/L	.000	-.008		<0.05 µg/L		
*** Sample ID: CCV					Seq: 364	12:57:31 03 Mar 2000 HG		
Hg	1.93	ug/L	.000	1.93		rV=2.0 97%		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: ICB					Seq: 365	13:14:17 03 Mar 2000 HG		
Hg	-.004	ug/L	.000	-.004			<0.050 µg/L	
*** Sample ID: BLK					Seq: 366	13:16:36 03 Mar 2000 HG		
Hg	.070	ug/L	.000	.070			0.004 ug	
*** Sample ID: BLK DUP					Seq: 367	13:18:55 03 Mar 2000 HG		2.9 %
Hg	.068	ug/L	.000	.068			0.003 ug	
*** Sample ID: 1633 B 0.5268g					Seq: 368	13:21:14 03 Mar 2000 HG		
Hg	1.70	ug/L	.000	1.70	TV = 0.141 ± 0.019		0.161 µg/kg	
*** Sample ID: 1633BDUP					Seq: 369	13:23:53 03 Mar 2000 HG RPD = 2.98		
Hg	1.65	ug/L	.000	1.65			0.157 mg/kg	
*** Sample ID: Q 87					Seq: 370	13:26:38 03 Mar 2000 HG		
Hg	.123	ug/L	.000	.123		0.019 ug ~~0.018 µg~~ ~~0.0062 µg~~ JMS 3/3/4.		
*** Sample ID: Q87 DUP					Seq: 371	13:28:57 03 Mar 2000 HG RPD = 6.3 %		
Hg	.131	ug/L	.000	.131		0.020 µg ~~0.0066 µg~~ JMS 3/3		
*** Sample ID: 47 Q 129					Seq: 372	13:31:16 03 Mar 2000 HG		
Hg	.024	ug/L	.000	.024		<0.0025 ug ~~0.0012 µg~~ JMS 3/4		
*** Sample ID: 47Q129DUP					Seq: 373	13:33:35 03 Mar 2000 HG RPD = <1.0 %		
Hg	.030	ug/L	.000	.030		<0.0025 ug ~~0.0015 µg~~ JMS 3/4		
*** Sample ID: 47 Q 127					Seq: 374	13:35:55 03 Mar 2000 HG		
Hg	.095	ug/L	.000	.095		NO DATA		
*** Sample ID: 47Q127DUP					Seq: 375	13:38:15 03 Mar 2000 HG RPD = 11 %		
Hg	.106	ug/L	.000	.106		NO DATA		
*** Sample ID: 47 Q 127					Seq: 376	13:42:48 03 Mar 2000 HG		
Hg	.096	ug/L	.000	.096			0.005 µg	

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 47Q127DUP					Seq: 377	13:45:08 03 Mar 2000 HG RPD = 4.3%		
Hg	.092	ug/L	.000	.092		0.005 µg		
*** Sample ID: Q 84					Seq: 378	13:47:38 03 Mar 2000 HG		
Hg	5.60	ug/L	.000	5.60		NO DATA		
*** Sample ID: 47 Q 132					Seq: 379	13:56:09 03 Mar 2000 HG		
Hg	.105	ug/L	.000	.105		NO DATA		
*** Sample ID: 47Q132DUP					Seq: 380	13:58:28 03 Mar 2000 HG RPD = 14.2		
Hg	.091	ug/L	.000	.091		NO DATA		
*** Sample ID: 47Q132TRP					Seq: 381	14:00:47 03 Mar 2000 HG		
Hg	.095	ug/L	.000	.095		NO DATA		
*** Sample ID: Q 85					Seq: 382	14:18:02 03 Mar 2000 HG		
Hg	.107	ug/L	.000	.107		0.016 µg	0 ug CORRECTED	
*** Sample ID: Q85DUP					Seq: 383	14:20:21 03 Mar 2000 HG RPD = <1.0%		
Hg	.107	ug/L	.000	.107		0.016 µg	0 ug CORRECTE	
*** Sample ID: Q85SPK					Seq: 384	14:22:40 03 Mar 2000 HG		
Hg	1.13	ug/L	.000	1.13		TV = 1.0 102%		
*** Sample ID: Q91					Seq: 385	14:26:41 03 Mar 2000 HG		
Hg	.203	ug/L	.000	.203			NO DATA	
*** Sample ID: Q91 DUP					Seq: 386	14:29:04 03 Mar 2000 HG		
Hg	.195	ug/L	.000	.195				
*** Sample ID: Q 94					Seq: 387	14:31:55 03 Mar 2000 HG		
Hg	.172	ug/L	.000	.172				
*** Sample ID: Q 94DUP					Seq: 388	14:34:16 03 Mar 2000 HG		
Hg	.159	ug/L	.000	.159				

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Q 92					Seq: 389	14:37:41 03 Mar 2000 HG		
Hg	2.52	ug/L	.000	2.52				
*** Sample ID: Q 92DUP					Seq: 390	14:40:17 03 Mar 2000 HG		
Hg	2.60	ug/L	.000	2.60				
*** Sample ID: Q 93					Seq: 391	14:42:47 03 Mar 2000 HG		
Hg	5.02	ug/L	.000	5.02		NO DATA		
*** Sample ID: CCB					Seq: 392	14:56:14 03 Mar 2000 HG		
Hg	-.010	ug/L	.000	-.010		<0.05		
*** Sample ID: CCV					Seq: 393	14:58:33 03 Mar 2000 HG		
Hg	1.92	ug/L	.000	1.92		TV=2.0 96%		
*** Sample ID: Q91					Seq: 394	15:01:16 03 Mar 2000 HG		
Hg	.201	ug/L	.000	.201		0.030 µg	0.011 ug corrected	
*** Sample ID: Q91 DUP					Seq: 395	15:03:35 03 Mar 2000 HG RPD=1.5%		
Hg	.198	ug/L	.000	.198		0.030 µg	0.011 ug corrected	
*** Sample ID: Q 94					Seq: 396	15:05:56 03 Mar 2000 HG		
Hg	.169	ug/L	.000	.169		0.025 µg	0.006 corrected	
*** Sample ID: Q 94DUP					Seq: 397	15:09:40 03 Mar 2000 HG RPD=<1.0%		
Hg	.168	ug/L	.000	.168		0.025 µg	0.006 corrected	
*** Sample ID: Q 92					Seq: 398	15:12:01 03 Mar 2000 HG		
Hg	2.54	ug/L	.000	2.54		1.40 ug		
*** Sample ID: Q 92DUP					Seq: 399	15:14:36 03 Mar 2000 HG RPD=<1.0%		
Hg	2.55	ug/L	.000	2.55		1.40 ug		
*** Sample ID: Q 93 1:5					Seq: 400	15:17:11 03 Mar 2000 HG		
Hg	1.03	ug/L	.000	1.03		2.54 ug		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Q 93DUP 1:5				Seq: 401	15:19:42 03 Mar 2000 HG RPD=21.0%			
Hg	1.04	ug/L	.000	1.04		2.56 ug		
*** Sample ID: 47 Q 136				Seq: 402	15:22:12 03 Mar 2000 HG			
Hg	.092	ug/L	.000	.092		0.005 µg		
*** Sample ID: 47Q136DUP				Seq: 403	15:24:32 03 Mar 2000 HG RPD=2.2%			
Hg	.090	ug/L	.000	.090		0.005 µg		
*** Sample ID: 47 Q 134				Seq: 404	15:26:52 03 Mar 2000 HG			
Hg	.044	ug/L	.000	.044		<0.0025 ~~<0.003 µg~~ JMO 3/4 ~~<0.005~~ JMP		
*** Sample ID: 47Q134DUP				Seq: 405	15:29:13 03 Mar 2000 HG RPD: N/A			
Hg	.048	ug/L	.000	.048		~~<0.003 µg~~ JMO 3/4 <0.0025		
*** Sample ID: 47 Q 128				Seq: 406	15:31:34 03 Mar 2000 HG			
Hg	.161	ug/L	.000	.161		0.008 µg		
*** Sample ID: 47Q128DUP				Seq: 407	15:33:55 03 Mar 2000 HG RPD=1.2%			
Hg	.163	ug/L	.000	.163		0.008 µg		
*** Sample ID: 47Q128TRP				Seq: 408	15:36:16 03 Mar 2000 HG RPD=2.5%			
Hg	.165	ug/L	.000	.165		0.008 µg		
*** Sample ID: 47 Q 135				Seq: 409	15:38:38 03 Mar 2000 HG			
Hg	.081	ug/L	.000	.081		0.004 µg		
*** Sample ID: 47Q135DUP				Seq: 410	15:41:00 03 Mar 2000 HG RPD=4.8%			
Hg	.085	ug/L	.000	.085		0.004 µg		
*** Sample ID: 47Q135SPK				Seq: 411	15:43:22 03 Mar 2000 HG			
Hg	1.09	ug/L	.000	1.09		TV=1.0 101%		
*** Sample ID: Q 84 1:5				Seq: 412	15:46:02 03 Mar 2000 HG			
Hg	1.16	ug/L	.000	1.16		2.73 ug		

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: Q 84DUP 1:5					Seq: 413	15:48:33 03 Mar 2000 HG RPD= <1.0%		
Hg	1.16	ug/L	.000	1.16		2.73 ug		
*** Sample ID: CCB					Seq: 414	15:51:04 03 Mar 2000 HG OK		
Hg	-.008	ug/L	.000	-.008		<0.05 µg/L		
*** Sample ID: CCV					Seq: 415	15:53:26 03 Mar 2000 HG		
Hg	1.93	ug/L	.000	1.93		TV=2.0 97%		
*** Sample ID: IBTKC 3					Seq: 416	15:56:03 03 Mar 2000 HG		
Hg	.944	ug/L	.000	.944		0.615 µg		
*** Sample ID: IBTKC3DUP					Seq: 417	16:00:12 03 Mar 2000 HG RPD=2.6%		
Hg	.969	ug/L	.000	.969		0.631 µg		
*** Sample ID: SBTKC3					Seq: 418	16:02:39 03 Mar 2000 HG		
Hg	.070	ug/L	.000	.070		0.045 µg		
*** Sample ID: SBTKC3DUP					Seq: 419	16:05:01 03 Mar 2000 HG RPD= 2.9 <1.0%		
Hg	.068	ug/L	.000	.068		0.044 µg		
*** Sample ID: CCB					Seq: 420	16:07:23 03 Mar 2000 HG		
Hg	-.008	ug/L	.000	-.008		<0.05 µg/L		
*** Sample ID: CCV					Seq: 421	16:09:45 03 Mar 2000 HG		
Hg	1.94	ug/L	.000	1.94		TV=2.0 97%		

*** Sample ID: CCB Seq: 425 17:35:50 03 Mar 2000 HG

Hg -.002 ug/L .000 -.002 <0.05 µg/L

*** Sample ID: CCV Seq: 426 17:38:09 03 Mar 2000 HG

Hg 1.94 ug/L .000 1.94 TV=2.0 97%

*** Sample ID: BLK Seq: 427 17:40:42 03 Mar 2000 HG

Hg .015 ug/L .000 .015 <0.05 µg/L

*** Sample ID: BLK DUP Seq: 428 17:43:01 03 Mar 2000 HG

Hg .018 ug/L .000 .018 <0.05 µg/L

*** Sample ID: 1633B 0.5885g Seq: 429 17:45:20 03 Mar 2000 HG

TV = 0.141 ± 0.019

Hg 1.91 ug/L .000 1.91 DW = 0.997 0.162 mg/kg DW

*** Sample ID: 1633BDUP Seq: 430 17:47:59 03 Mar 2000 HG RPD = 1.5%

Hg 1.88 ug/L .000 1.88 0.160 mg/kg DW

*** Sample ID: 47Q137 Seq: 431 17:50:39 03 Mar 2000 HG

Hg .129 ug/L .000 .129 NO DATA

*** Sample ID: 47Q137DUP Seq: 432 17:52:58 03 Mar 2000 HG RPD = 10.2%

Hg .143 ug/L .000 .143 NO DATA

*** Sample ID: CCB Seq: 433 17:55:17 03 Mar 2000 HG

Hg -.006 ug/L .000 -.006 <0.05 µg/L

17:57:37 03 Mar 2000 Folder: MARA00 Protocol: SYSTEST labsys2 Page 50

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: CCV Seq: 434 17:57:37 03 Mar 2000 HG

Hg 1.94 ug/L .000 1.94 TV = 2.0 97%

*** Sample ID: REAL 7 Seq: 435 18:00:00 03 Mar 2000 HG

Hg ~~-.009 ug/L .000 -.009~~ NO DATA

*** Sample ID: 47Q132 Seq: 441 18:15:21 03 Mar 2000 HG

Hg .099 ug/L .000 .099 0.005 µg

*** Sample ID: 47Q132DUP Seq: 442 18:17:40 03 Mar 2000 HG RPD = 1.0%

Hg .098 ug/L .000 .098 0.005 µg

*** Sample ID: 47Q132TRP Seq: 443 18:20:00 03 Mar 2000 HG RPD = 5.9%

Hg .105 ug/L .000 .105 0.005 µg

*** Sample ID: CCB Seq: 448 18:31:38 03 Mar 2000 HG

Hg	-.001	ug/L	.000	-.001

<0.05 µg/L

*** Sample ID: CCV Seq: 449 18:33:58 03 Mar 2000 HG

Hg	1.94	ug/L	.000	1.94

TV=2.0 97%

*** Sample ID: CCB Seq: 448 18:31:38 03 Mar 2000 HG

Hg	-.001	ug/L	.000	-.001

*** Sample ID: CCV Seq: 449 18:33:58 03 Mar 2000 HG

Hg	1.94	ug/L	.000	1.94

*** Sample ID: IR1AL 4 Seq: 450 18:36:37 03 Mar 2000 HG

Hg .049 ug/L .000 .049

*** Sample ID: IR1AL 4DUP Seq: 451 18:38:57 03 Mar 2000 HG

Hg .041 ug/L .000 .041

*** Sample ID: IR2AL 4 Seq: 452 18:41:18 03 Mar 2000 HG

Hg .048 ug/L .000 .048

*** Sample ID: IR2AL 4DUP Seq: 453 18:43:38 03 Mar 2000 HG

Hg .058 ug/L .000 .058

*** Sample ID: IR2AL 4 Seq: 454 18:47:05 03 Mar 2000 HG

Hg .049 ug/L .000 .049

*** Sample ID: IR2AL 4DUP Seq: 455 18:50:40 03 Mar 2000 HG

Hg .037 ug/L .000 .037

*** Sample ID: IR3AL 4 Seq: 456 18:53:01 03 Mar 2000 HG

Hg .050 ug/L .000 .050

*** Sample ID: IR3AL 4DUP Seq: 457 18:55:21 03 Mar 2000 HG

Hg .053 ug/L .000 .053

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: IR3AL 4TRP Seq: 458 18:57:42 03 Mar 2000 HG

Hg .055 ug/L .000 .055

*** Sample ID: IR4AL 4 Seq: 459 19:00:03 03 Mar 2000 HG

Hg .057 ug/L .000 .057

*** Sample ID: IR4AL 4DUP Seq: 460 19:02:23 03 Mar 2000 HG

Hg .048 ug/L .000 .048

*** Sample ID: IR4AL 4 Seq: 461 19:07:49 03 Mar 2000 HG

Hg .045 ug/L .000 .045

*** Sample ID: IR4AL 4DUP Seq: 462 19:10:10 03 Mar 2000 HG

Hg .042 ug/L .000 .042

*** Sample ID: IR4AL 4SPK Seq: 463 19:12:31 03 Mar 2000 HG

Hg .936 ug/L .000 .936

*** Sample ID: 47Q137 Seq: 464 19:16:15 03 Mar 2000 HG

Hg .147 ug/L .000 .147 0.007 ug

*** Sample ID: 47Q137DUP Seq: 465 19:18:35 03 Mar 2000 HG 4.6% RPD

Hg .154 ug/L .000 .154 0.008

*** Sample ID: CCB Seq: 466 19:22:33 03 Mar 2000 HG

Hg .004 ug/L .000 .004

*** Sample ID: CCV Seq: 467 19:24:54 03 Mar 2000 HG

Hg 1.93 ug/L .000 1.93

*** Sample ID: SBTAL 4 Seq: 468 19:27:31 03 Mar 2000 HG

Hg .007 ug/L .000 .007

*** Sample ID: SBTAL 4DUP Seq: 469 19:29:53 03 Mar 2000 HG

Hg .014 ug/L .000 .014

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: SR1AL 4 Seq: 470 19:32:14 03 Mar 2000 HG

Hg .069 ug/L .000 .069

*** Sample ID: SR1AL 4DUP Seq: 471 19:34:35 03 Mar 2000 HG

Hg .057 ug/L .000 .057

Dry Weight Analysis Data

Dry Weight/Total Volatile Solids (TVS) Notebook # 6

Sample Number	1392067	1392068	1392069	CLINTON RUN 1	CLINTON RUN 2	CLINTON RUN 3
Client/Pan #	1	2	3	4	5	6
Wt of Pan + Sample	21.3806	21.4453	21.4115	21.1620	21.8783	21.4211
Wt after Drying	20.1279	20.2170	RP 2/23/00	16.3895	16.8942	16.7594
Wt of Pan or Wt After Ignition	1.0206	1.0243	1.0121	1.0187	1.0146	1.0140
Difference	19.1073	19.1927		15.3708	15.8796	15.7454
Sample amount g	20.3600	20.4210	20.4994	20.1433	20.8637	20.4071
Result	93.8%	94.0%		76.3%	76.1%	77.2%

Sample Number						
Client/Pan #						
Wt of Pan + Sample						
Wt after Drying						
Wt of Pan or Wt After Ignition						
Difference						
Sample amount g						
Result						

Sample Number					
Client/Pan #					
Wt of Pan + Sample					
Wt after Drying					
Wt of Pan or Wt After Ignition					
Difference					
Sample amount g					
Result					

Batch Number: N/A

Note: METCO ENV. (METALS)

Analyst: RXP Date: 3/22/00

TestAmerica INCORPORATED

METCO Particulate Analysis

METCO Environmental

Particulate Analysis EPA Method 17

Thimbles and Backup Filters

Job Number 99-95 MONI

Job Name KCPL

Location Clinton MO

Unit Tested #1 Pacific Foods

Desiccator Time In	1600 1/21				
Desiccator Time Out	1050 1/25	1000 1/26			

Run No. 1	Thimble No. Q84		Filter No. 470127		
Thimble Final Weight (g)	8.7427	8.7412	✓		
Thimble Initial Weight (g)	3.8692	3.8692			
Particulate (g)	4.8735	4.8720			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1154	0.1152	✓		

Filter and Particulate Average (g) 0.1153

Initial Filter Weight (g) 0.1188

Filter Particulate Average (mg) 0

Thimble Particulate Average (mg) 4672.8 JAM 3/4

Total Particulate (mg)

Run No. 2	Thimble No. Q92		Filter No. 470135		
Thimble Final Weight (g)	8.8111	8.8099	✓		
Thimble Initial Weight (g)	3.0433	3.0433			
Particulate (g)	5.7678	5.7665	--		
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1143	0.1139	✓		

Filter and Particulate Average (g) 0.1141

Initial Filter Weight (g) 0.1173

Filter Particulate Average (mg) 0

Thimble Particulate Average (mg) 5767.2

Total Particulate (mg) 5767.2

Run No. 3	Thimble No. Q93		Filter No. 470136		
Thimble Final Weight (g)	8.5133	8.5085	✓		
Thimble Initial Weight (g)	3.4156	3.4156			
Particulate (g)	5.0977	5.0929			
Filter & Particulate + Tare Weight (g)					
Tare Weight (g)					
Filter & Particulate (g)	0.1121	0.1117	✓		

Filter and Particulate Average (g) 0.1119

Initial Filter Weight (g) 0.1156

Filter Particulate Average (mg)

Thimble Particulate Average (mg) 5095.3 JAM 3/4

Total Particulate (mg)

MK

Analyst

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE ENVIRONMENTAL TESTING

• EPA/NVLAP 101262-0 • NY DOH 10903 • NJ DEP 77678
• AIHA ACCREDITATION NO. 100439 • PA DER 06-353

ANALYTICAL REPORT

Client: METCO Environmental

Report to: Doug Saathoff
METCO Environmental
P. O. Box 598
Addison TX 75001

Project: 190117
Received: 02-FEB-00
Reported: 16-FEB-00

Project Description: 99-95 MON 1/EDRI-KCPL Clinton, MO
Unit 1 - 3 Runs of Coal

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 1 Coal Sample (1-18-00, 1415-1710)						
Lab Sample: 1391368						
sampled: 18-JAN-00 17:10 by: KCPL						
Moisture, Total	16.6		%	D 3302	02-FEB-00	GLB
Chlorine, Total	0.02	0.02	%	300.0	04-FEB-00	DRK
SHORT PROX - COAL						
Ash	4.01	4.81	%	D 3174	07-FEB-00	VJO
Sulfur	0.17	0.20	%	D 4239	04-FEB-00	VJO
Heating Value	8710	10440	BTU/lb	D 3286	04-FEB-00	VJO
Run 2 Coal Sample (1-19-00, 0900-1115)						
Lab Sample: 1391369						
sampled: 19-JAN-00 11:15 by: KCPL						
Moisture, Total	15.7		%	D 3302	02-FEB-00	GLB
Chlorine, Total	0.01	0.01	%	300.0	04-FEB-00	DRK
SHORT PROX - COAL						
Ash	4.82	5.72	%	D 3174	07-FEB-00	VJO
Sulfur	0.17	0.20	%	D 4239	04-FEB-00	VJO
Heating Value	8690	10300	BTU/lb	D 3286	04-FEB-00	VJO
Run 3 Coal Sample (1-19-00, 1230-1445)						
Lab Sample: 1391370						
sampled: 19-JAN-00 14:45 by: KCPL						
Moisture, Total	17.4		%	D 3302	02-FEB-00	GLB
Chlorine, Total	0.01	0.01	%	300.0	04-FEB-00	DRK
SHORT PROX - COAL						
Ash	4.13	5.00	%	D 3174	07-FEB-00	VJO
Sulfur	0.17	0.21	%	D 4239	04-FEB-00	VJO

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-8833 FAX 610-921-9667

PHILIP ANALYTICAL SERVICES

INDUSTRIAL HYGIENE
• EPA/NVLAP 101262-0
• AIHA ACCREDITATION NO. 100439

ENVIRONMENTAL TESTING
• NY DOH 10903
• PA DER 06-353
• NJ DEP 77678

Client: METCO Environmental
Project: 190117

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
Run 3 Coal Sample (1-19-00, 1230-1445)						
Lab Sample: 1391370 - continued						
Heating Value	8660	10500	BTU/lb	D 3286	04-FEB-00	VJO

< Indicates less than the limit of quantitation.

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-8833 FAX 610-921-9667

Philip Analytical Services
Quality Assurance Protocol

PAS Sample #: 1391368,1391369,1391370

Client Name: Metco

PAS Project #: 190117

Job ID :

Units: BTU/lb,%

O1 SUMMARY FORM

Sample # & Parameter	Matrix Spike				Matrix Spike Duplicate				Laboratory Control Sample		
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Matrix Spike Recovery	Matrix Spike Dup Conc.	Matrix Spike Dup Recovery	Precision RPD	Method Blank	Spikes Conc.	Found Conc.	Recovery

Sample # & Parameter	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spike Conc.	Matrix Spike Conc.	Matrix Spike Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD	Spikes Conc.	Found Conc.	Recovery		
1391370-Heating Value					92.9	9370	0.85	13370	13360	100	N/A	50
1391368-Sulfur					0.15	0.18	18	1.79	1.86	104	N/A	0.01
1391370-Ash					4.43	4.50	1.56	11.9	11.9	100	N/A	0.01

Matrix Spike	75 - 125
Laboratory Control Sample	80 - 120
Duplicate	0 - 20

^ 2/16/00 + page 1

Metco
190117
#1391368

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	5.32	5.32	****
MOISTURE:	%	11.90	11.27 > 16.6	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	79.40	95.19
ASH:	%	4.24	4.01	4.81
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	9195	8710	10440
SULFUR:	%	0.18	0.17	0.20
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-1.26	-1.51
HYDROGEN INCL WATER:	%	0.00	0.60	****
[illegible]:	%	0.00	0.00	0.00
[illegible]:	%	0.02	0.02	0.02
OXYGEN EXCL WATER:	%	****	80.47	96.47
OXYGEN INCL WATER:	%	95.56	95.20	****
ULT TOTAL [illegible]:	%	****	100.00	100.00
ULT TOTAL [illegible]:	%	100.00	100.00	****

^ 2/16/00 + page 1

Metco
190117
#1391369

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	4.46	4.46	****
MOISTURE:	%	11.70	11.18 > 15.7	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	79.55	94.29
ASH:	%	5.04	4.82	5.71
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	9095	8690	10300
[illegible]:	%	0.18	0.17	0.20
[illegible]:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-1.25	-1.48
HYDROGEN [illegible] WATER:	%	0.00	0.50	****
[illegible]:	%	0.00	0.00	0.00
[illegible]:	%	0.01	0.01	0.01
OXYGEN [illegible]:	%	****	80.62	95.56
OXYGEN [illegible]:	%	94.77	94.50	****
ULT TOTAL [illegible]:	%	****	100.00	100.00
ULT TOTAL [illegible]:	%	100.00	100.00	****

^ 2/16/00 + p[illegible] 1

Metco 190117

#1391370

		INPUT AIR DRY	AS RECEIVED	DRY BASIS
S[illegible] ID:				
AIR DRY LOSS:	%	6.72	6.72	****
MOISTURE:	%	11.50	10.73 > 17.4	****
VOLATI[illegible]:	%	0.00	0.00	0.00
FIXED C[illegible]:	%	****	78.42	94.99
[illegible]:	%	4.43	4.13	5.01
PROXIMATE T[illegible]L:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	9289	8660	10500
[illegible]UR:	%	0.18	0.17	0.20
[illegible]:	%	0.00	0.00	0.00
HYDROGEN EQUIVALENT WATER:	%	0.00	-1.20	-1.45
HYDROGE[illegible]:	%	0.00	0.75	****
[illegible]:	%	0.00	0.00	0.00
[illegible]:	%	0.01	0.01	0.01
OXYGEN[illegible]:	%	****	79.44	96.23
OXY[illegible]:	%	95.38	94.94	****
ULT T[illegible]:	%	****	100.00	100.00
ULT T[illegible]:	%	100.00	100.00	****

APPENDIX E

Unit Operational Data

Run 1

oint	06_Ambi-ent_1	06_Stac-k_Prs_1	06_Stac-k_Tmp_1	06_Flow-_1	06_CO2c-_1	06_Load-_1	06_NOx_-b_Raw_1	06_SO2_-b_Raw_1
nits	PSI	PSI	Deg F	KCFM	%	MWGE	#/mmBtu	#/mmBtu
ull Scale	15.00	15.00	500.0	1000	20.00	190.0	1.000	2.000
1/18/00 14:15	14.33>	14.33	327.0	435!	12.50!	163.7	0.278!	0.450!
1/18/00 14:30	14.34>	14.33	327.5	435!	12.50!	164.2	0.274!	0.450!
1/18/00 14:45	14.35>	14.34	326.7	438!	12.50!	164.1	0.280!	0.450!
1/18/00 15:00	14.34>	14.34	327.7	435!	12.50!	164.3	0.281!	0.450!
1/18/00 15:15	14.35>	14.34	328.5	434!	12.50!	164.2	0.278!	0.450!
1/18/00 15:30	14.35>	14.33	330.0	433!	12.50!	163.9	0.286!	0.450!
1/18/00 15:45	14.34>	14.33	331.0	429!	12.50!	163.2	0.281!	0.440!
1/18/00 16:00	14.34>	14.34	331.2	430!	12.50!	163.2	0.279!	0.440!
1/18/00 16:15	14.34>	14.33	332.2	433!	12.60!	163.2	0.283!	0.440!
1/18/00 16:30	14.34>	14.34	332.2	433!	12.60!	163.6	0.280!	0.440!
1/18/00 16:45	14.35>	14.34	332.5	430!	12.60!	163.7	0.281!	0.440!
1/18/00 17:00	14.35>	14.34	333.0	431!	12.60!	163.2	0.285!	0.440!
1/18/00 17:15	14.34>	14.34	334.0	435!	12.60!	165.6	0.284!	0.440!
verage	14.34	14.34	330.3	433	12.54	163.9	0.281	0.445
inimum	14.33	14.33	326.7	429	12.50	163.2	0.274	0.440
aximum	14.35	14.34	334.0	438	12.60	165.6	0.286	0.450
ssing (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nvalid (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
alid (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
vailable(%)	NA	NA	NA	NA	NA	NA	NA	NA

MissingData	F PowerFailure	P InPurge	f DiscreteMissing	D Downed	C InCalibration
Part60-OOC	O Part75-OOC	B NoSamples	< TooFewSamples	r Reserved_1	u Reserved_2
HighAlarm	a LowAlarm	m EPA_MinCO2MaxO2	G EPA_AppG_CO2	> EnoughSamples	E Edited
StackOffline	! PrimaryMonitor	@ BackupMonitor	# Alternate	$ ReferenceMethod	% Parametric
Average(HB/HA)	& Init_QA_Hrs_Avg	* 90thPercentile	(95thPercentile	) BinMaximum	- BinAverage
MaxPotential	; Other				

Run 1

18-JAN-00 14:15:00
18-JAN-00 17:15:00
15M

	Steam Flow FI-1000	AIR OUT A TI-1617A	AIR OUT B TI-1617B	Opacity AI-1690A
18-Jan-00 14:15:00	1085.86	331.30	341.03	14.64
18-Jan-00 14:30:00	1086.56	331.67	341.37	14.18
18-Jan-00 14:45:00	1087.27	332.04	341.70	14.55
18-Jan-00 15:00:00	1087.97	332.40	342.04	14.55
18-Jan-00 15:15:00	1088.68	332.77	342.37	17.59
18-Jan-00 15:30:00	1089.39	333.13	342.71	14.66
18-Jan-00 15:45:00	1090.09	333.48	343.04	14.75
18-Jan-00 16:00:00	1090.80	333.77	343.43	14.69
18-Jan-00 16:15:00	1091.50	334.06	343.82	14.17
18-Jan-00 16:30:00	1092.21	334.35	344.21	14.97
18-Jan-00 16:45:00	1092.92	334.63	344.60	13.73
18-Jan-00 17:00:00	1093.62	334.92	344.99	16.15
18-Jan-00 17:15:00	1091.47	335.21	345.38	17.05

Avg = 15.05

Run 2

oint	06_Ambi-ent_1	06_Stac-k_Prs_1	06_Stac-k_Tmp_1	06_Flow-_1	06_CO2c-_1	06_Load-_1	06_NOx_-b_Raw_1	06_SO2_-b_Raw_1
nits	PSI	PSI	Deg F	KCFM	%	MWGE	#/mmBtu	#/mmBtu
ull Scale	15.00	15.00	500.0	1000	20.00	190.0	1.000	2.000
1/19/00 09:00	14.17>	14.17	336.0	449!	12.10!	165.5	0.286!	0.460!
1/19/00 09:15	14.18>	14.17	332.5	445!	12.20!	165.3	0.292!	0.460!
1/19/00 09:30	14.16>	14.15	333.0	433!	12.10!	157.8	0.300!	0.460!
1/19/00 09:45	14.16>	14.16	334.2	438!	12.20!	164.7	0.284!	0.460!
/19/00 10:00	14.17>	14.16	332.2	433!	12.30!	163.4	0.279!	0.460!
1/19/00 10:15	14.15>	14.15	332.2	433!	12.40!	164.1	0.286!	0.460!
1/19/00 10:30	14.15>	14.15	332.7	435!	12.40!	164.1	0.276!	0.450!
1/19/00 10:45	14.16>	14.15	333.5	436!	12.40!	164.1	0.275!	0.450!
1/19/00 11:00	14.15>	14.14	334.5	430!	12.40!	163.9	0.281!	0.450!
1/19/00 11:15	14.14>	14.12	337.0	435!	12.30!	164.1	0.285!	0.460!
verage	14.16	14.15	333.8	437	12.28	163.7	0.284	0.457
inimum	14.14	14.12	332.2	430	12.10	157.8	0.275	0.450
aximum	14.18	14.17	337.0	449	12.40	165.5	0.300	0.460
ssing (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nvalid (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
alid (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
vailable(%)	NA	NA	NA	NA	NA	NA	NA	NA

MissingData	F PowerFailure	P InPurge	f DiscreteMissing	D Downed	C InCalibration
Part60-OOC	O Part75-OOC	B NoSamples	< TooFewSamples	r Reserved_1	u Reserved_2
HighAlarm	a LowAlarm	m EPA_MinCO2MaxO2	G EPA_AppG_CO2	> EnoughSamples	E Edited
StackOffline	! PrimaryMonitor	@ BackupMonitor	# Alternate	$ ReferenceMethod	% Parametric
Average(HB/HA)	& Init_QA_Hrs_Avg	* 90thPercentile	(95thPercentile	) BinMaximum	- BinAverage
MaxPotential	; Other				

19-JAN-00 09:00:00
19-JAN-00 11:15:00
15M

Run 2

	Steam Flow FI-1000	AIR OUT A TI-1617A	AIR OUT B TI-1617B	Opacity AI-1690A
19-Jan-00 09:00:00	1084.89	329.96	347.02	15.90
19-Jan-00 09:15:00	1072.03	330.53	347.20	18.88
19-Jan-00 09:30:00	1050.77	331.10	347.37	18.14
19-Jan-00 09:45:00	1083.93	331.67	347.55	20.72
19-Jan-00 10:00:00	1083.42	332.24	347.72	15.61
19-Jan-00 10:15:00	1082.92	332.80	347.90	16.30
19-Jan-00 10:30:00	1082.41	333.37	348.07	16.71
19-Jan-00 10:45:00	1081.91	333.94	348.25	17.60
19-Jan-00 11:00:00	1081.41	334.51	348.43	17.27
19-Jan-00 11:15:00	1080.90	335.08	348.60	15.64
#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A

17.24

Run 3

oint	06_Ambi-ent_1	06_Stac-k_Prs_1	06_Stac-k_Tmp_1	06_Flow-_1	06_CO2c-_1	06_Load-_1	06_NOx_-b_Raw_1	06_SO2_-b_Raw_1
nits	PSI	PSI	Deg F	KCFM	%	MWGE	#/mmBtu	#/mmBtu
ull Scale	15.00	15.00	500.0	1000	20.00	190.0	1.000	2.000
1/19/00 12:30	14.11>	14.10	335.7	438!	12.30!	165.3	0.288!	0.460!
1/19/00 12:45	14.11>	14.10	335.2	433!	12.30!	164.1	0.279!	0.450!
1/19/00 13:00	14.11>	14.09	335.5	431!	12.30!	163.8	0.285!	0.450!
1/19/00 13:15	14.09>	14.09	336.5	431!	12.30!	164.1	0.280!	0.440!
1/19/00 13:30	14.11>	14.09	337.2	436!	12.30!	164.3	0.284!	0.440!
1/19/00 13:45	14.10>	14.09	338.0	434>!	12.30!	164.2	0.300!	0.450!
1/19/00 14:00	14.12>	14.10	339.5	431>!	12.30!	163.7	0.296!	0.440!
1/19/00 14:15	14.11>	14.10	339.5	433!	12.30!	163.5	0.292!	0.440!
1/19/00 14:30	14.10>	14.10	340.2	432!	12.30!	163.7	0.292!	0.440!
1/19/00 14:45	14.12>	14.11	340.7	416!	12.30!	151.6	0.274!	0.440!
verage	14.11	14.10	337.8	432	12.30	162.8	0.287	0.445
inimum	14.09	14.09	335.2	416	12.30	151.6	0.274	0.440
aximum	14.12	14.11	340.7	438	12.30	165.3	0.300	0.460
ssing (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nvalid (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cal (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
alid (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
ailable(%)	NA	NA	NA	NA	NA	NA	NA	NA

MissingData	F PowerFailure	P InPurge	f DiscreteMissing	D Downed	C InCalibration
Part60-OOC	O Part75-OOC	B NoSamples	< TooFewSamples	r Reserved_1	u Reserved_2
HighAlarm	a LowAlarm	m EPA_MinCO2MaxO2	G EPA_AppG_CO2	> EnoughSamples	E Edited
StackOffline	! PrimaryMonitor	@ BackupMonitor	# Alternate	$ ReferenceMethod	% Parametric
Average(HB/HA)	& Init_QA_Hrs_Avg	* 90thPercentile	(95thPercentile	) BinMaximum	- BinAverage
MaxPotential	! Other				

19-JAN-00 12:30:00
19-JAN-00 14:45:00
15M

Run 3

	Steam Flow FI-1000	AIR OUT A TI-1617A	AIR OUT B TI-1617B	Opacity AI-1690A
19-Jan-00 12:30:00	1068.94	340.08	352.78	17.44
19-Jan-00 12:45:00	1067.59	340.75	353.19	15.01
19-Jan-00 13:00:00	1066.24	341.43	353.60	23.98
19-Jan-00 13:15:00	1064.90	342.11	354.02	16.42
19-Jan-00 13:30:00	1063.55	342.79	354 43	14.83
19-Jan-00 13:45:00	1062.20	343.47	354.84	15.11
19-Jan-00 14:00:00	1060.85	344.15	355.25	14.51
19-Jan-00 14:15:00	1059.50	344.83	355.67	14.93
19-Jan-00 14:30:00	1058.15	345.51	356.08	14.48
19-Jan-00 14:45:00	983.92	346.18	356.49	17.59
#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A

Avg - 16.43

KCPL - Montrose Unit 1

1/18/00 RUN 1 184,975 #/HR

1/19/00 RUN 2 184,750 #/HR

1/19/00 RUN 3 183,735 #/HR

Calculated Fuel Flows During Testing

Possible error up to ± 2%

(2)

APPENDIX F

Chain of Custody Records

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95mon1
Job Name: EPRI- KCPL
Location: Clinton, MO
Unit: Unit 1 Precipitator East Inlet

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
~~Gas~~ Run1 - Container 1 Filter	1-18-00	1718	✓				II	MB									✓			Thimble # Q84 Filter 478127
Run 1 - Container 2 0.1 N HNO_3 ~~Rinse Imp 1,2~~ F.W.	1-18-00	1719	✓				I	MB									✓			Container 2A not recovered.
Run1 - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-18-00	1730	✓				II	MB									✓			
Run1 - Container 4 0.1 N HNO_3 Rinse Imp 4	1-18-00	1732	✓				I	MB									✓			
Run1 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-18-00	1745	✓				I	MB									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hyby	1-19-00	Jason Conway	Jason Conway	1-21-00	Irene Ole
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	2/2/00	JPP			pin - 3 runs M. Hunter 1/26/00

Received for Laboratory By/Signature: / , Date/Time

Send Samples to: TestAmerica Jim Davis

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95 MONI
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Precipitator East Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Run 2 - Container 1 Filter	1-19-00	1145	✓				II	BH									✓			Thimble #Q92 Filter # 47Q135
Run 2 - Container 2 0.1 N HNO_3 F.W.	1-19-00	1146	✓				I	BH									✓			Container 2A not recovered.
Run 2 - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1236	✓				II	BH									✓			
Run 2 - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1238	✓				I	BH									✓			
Run 2 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1246	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill [illegible]	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	2/2/00	[illegible]			

Received for Laboratory By/Signature: [illegible] Date/Time [illegible]

Send Samples to: TestAmerica Jim Davis

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95MON1
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Precipitator East Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Run 3 - Container 1 Filter	1-19-00	1508	✓				II	MB									✓			Thimble #Q93 Filter #47Q136
Run 3 - Container 2 0.1 N. HNO_3 F.W.	1-19-00	1509	✓				I	MB									✓			Container 2A not recovered
Run 3 - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1521	✓				II	MB									✓			
Run 3 - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1523	✓				I	MB									✓			
Run 3 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1532	✓				I	MB									✓			Used $NH_2OH \cdot H_2SO_4$

Analyze according to the Ontario Hydro method.

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Tuffy	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	2/2/00	[illegible]			
Received for Laboratory By/Signature: [illegible]	Date/Time		Send Samples to: TestAmerica Jim Davis		

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95MON1
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Precipitator East Inlet Duct

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Blank Train - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1105	✓				I	BH									✓			Containers 1, 2, and 2A not recovered.
Blank Train - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1110	✓				I	BH									✓			
Blank Train - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1118	✓				I	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Analyze according to the Ontario Hydro method.

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Duffy	1-19-00	Jason Conway	Jason Conway	1-21-00	Shane Lee
Relinquished By/Sign:	Date/Time 2/2/00	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature:		Date/Time	Send Samples to: TestAmerica Jim Davis. Phone:		Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95MON1
Job Name: EPRI-KCPL
Location: Clinton, MO
Unit: Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Run 1 Container 1 Filter	1-18-00	1756	✓				1	BH									✓			47Q132 Filters#: 47Q128 Thimble#: Q85
Run 1 Container 2 0.1 N HNO_3 F.W.	1-18-00	1759	✓				1	BH									✓			Container 2A not recovered.
Run 1 Container 3 10% HNO_3 Rinse Imp 1,2,3	1-18-00	1805	✓				1	BH									✓			
Run 1 Container 4 0.1 N HNO_3 Rinse Imp 4	1-18-00	1807	✓				1	BH									✓			
Run 1 Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-18-00	1815	✓				1	BH									✓			Used $NH_2OH \cdot H_2SO_4$

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill [illegible]	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	2/2/00	[illegible]			P Manalysis M. Hunter 1/26/00

Received for Laboratory By/Signature: Roberta Kornas / Fed X
Date/Time: 2-2-00 1020
Send Samples to: TestAmerica Jim Davis 3 runs
Phone:
Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95MON1
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Run 2 - Container 1 Filter	1-19-00	1256	✓				II	BH									✓			Thimble iQ91 Filter 470124
Run 2 - Container 2 0.1 N HNO_3 F.W.	1-19-00	1257	✓				I	BH									✓			Container 2A not recovered.
Run 2 - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1305	✓				II	BH									✓			
Run 2 - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1307	✓				I	BH									✓			
Run 2 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1316	✓				I	BH									✓			Used NH_2OH H_2SO_4

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hyly	1-19-00	Jason Cawley	Jason Cawley	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time 2/2/00	Received By/Sign: [illegible]	Relinquished By/Sign:	Date/Time	Received By/Sign:
Received for Laboratory By/Signature:		Date/Time	Send Samples to: TestAmerica Jim Davis		

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95MON1
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Run 3 - Container 1 Filter	1-19-00	1547	✓				II	MB									✓			Thimble Q94 Filter 470137
Run 3 - Container 2 0.1 N HNO_3 F.W.	1-19-00	1548	✓				I	MB									✓			Container 2A not recovered
Run 3 - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1547	✓				II	MB									✓			
Run 3 - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1559	✓				I	MB									✓			
Run 3 - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1608	N				I	MB									✓			Used NH_4OH - H_2SO_4

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill [illegible]	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
	2/2/00	[illegible]			

Received for Laboratory By/Signature: Celeste Kerns / Fed X
Date/Time: 2-2-00 1620

Send Samples to: TestAmerica Jim Davis
Phone:
Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95mon1
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1 Stack

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Blank Train - Container 3 10% HNO_3 Rinse Imp 1,2,3	1-19-00	1408	✓				I	BH									✓			Containers 1, 2, and 2A not recovered.
Blank Train - Container 4 0.1 N HNO_3 Rinse Imp 4	1-19-00	1409	✓				I	BH									✓			
Blank Train - Container 5 0.1 N HNO_3 Rinse Imp 5,6,7	1-19-00	1413	✓				I	BH									✓			
																	BH			

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hufty	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time 2/2/00	Received By/Sign: [illegible]	Relinquished By/Sign:	Date/Time	Received By/Sign:

Received for Laboratory By/Signature: Celeste Kerns / Fedex

Date/Time: 2-2-00 1020

Send Samples to: TestAmerica Jim Davis

Phone:

Fax:

METCO ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95 MON 1
Job Name: EPRI - KCPL
Location: ~~Unit~~ Clinton, MO
Unit: Unit 1

Collected By/Company: METCO Environmental

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	HEXCHROME	Hg			REMARKS (Specific Compounds/Methods)
Container 7 0.1 N HNO_3 Reagent Blank	1-18-00	1418	✓				I	BH									✓			Vol. = 50 ml
Container 8 1 M KCl Reagent Blank	1-18-00	1419	✓				I	BH									✓			Vol. = 54 ml
Container 9 5% HNO_3 10% H_2O_2 Reagent Blank	1-18-00	1420	✓				I	BH									✓			Vol. = 51 ml
Container 10 $KMnO_4$ - H_2SO_4 Reagent Blank	1-18-00	1422	✓				I	BH									✓			Vol. = 50 ml
Container 11 $NH_2OH \cdot H_2SO_4$ Reagent Blank	1-18-00	1423	✓				I	BH									✓			Vol. = 100 ml
Container 12 Filter Reagent Blank	1-18-00	1426	✓				IV	BH									✓			Filter #'s 470129, 470130, 470131 Thimbles: Q87, Q88, Q85

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Tuffey	1-19-00	Jason Conway	Jason Conway	1-21-00	[illegible]
Relinquished By/Sign:	Date/Time 2/2/00	Received By/Sign: [illegible]	Relinquished By/Sign:	Date/Time	Received By/Sign:

Received for Laboratory By/Signature: [illegible] Date/Time [illegible]

Send Samples to: TestAmerica Jim Davis
Phone: Fax:

MITRIW ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Job No: 99-95 MON 1 (190117)
Job Name: EPRI - KCPL
Location: Clinton, MO
Unit: Unit 1

Collected By/Company: KCPL

SAMPLE ANALYSIS REQUIRED

SAMPLE I.D.	DATE	TIME	AIR	SOLID	COMP	GRAB	# of CONTAINERS	RECOVERED BY	PART	HCL	CL2	METALS	PCDD/PCDF	SEMI-VOC	VOST	BETA HEXACHLOROMET	Hg	SULFUR	FLY ASH	REMARKS (Specific Compounds/Methods)
Run 1 Coal Sample	1-18-00	1415-1710				✓	34	CP			✓					✓	✓	✓	✓	Analyse ~~accordi~~ according to Astm methods D6414-99, D2361-95, D-0516, D-3174, D-3286. Prep & send 1 Aliquot to TestAmerica for Hg
Run 2 Coal Sample	1-19-00	0900-1115				✓	30	DC			✓					✓	✓	✓	✓	and 1 Aliquot to EERC.
Run 3 Coal Sample	1-19-00	1230-1445				✓	25	DC			✓					✓	✓	✓	✓	
2/1/00 1135 Left VM msg for Billy Hetley																				
2/2/00 1000 Per Bill Hetley - 1 pkg delayed																				

Relinquished By/Sign:	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:
Bill Hetley	1-19-00	Jason Conway	Jason Conway	1-21-00	~~Received By/Sign:~~ ~~Mr. Hunter 1/26/00~~
Relinquished By/Sign: Fed Ex - 3 boxes	Date/Time	Received By/Sign:	Relinquished By/Sign:	Date/Time	Received By/Sign:

Received for Laboratory By/Signature: Greenawalt Date/Time 2-1-00 1030

Send Samples to: Philips Analytical
Phone: Fax:

APPENDIX G

Resumes

BILLY J. MULLINS, JR.; President

Education	Post Graduate Study Environmental Engineering at Southern Methodist University; Dallas, Texas 1970. M.S. 1969, New York University; New York, New York, in Civil Engineering (Air Resources). B.S. 1968, Texas Tech University; Lubbock, Texas, in Civil Engr. (Water Resources). Studies in Engineering at U.S. Naval Academy; Annapolis, Maryland, 1963-1964.
Professional Training Courses	Attended Short Course on Air Pollution Engineering at the University of Texas at Austin, February 1970. Attended four-week management course presented by the American Management Association, 1976.
Certification	Registered Professional Engineer Certified Visible Emissions Evaluator Licensed Private Pilot (Multi-Engine-Land, Instrument) Diplomat in the American Academy of Environmental Engineers Inductee into the Stack Sampling Hall of Fame Certified as Qualified Environmental Professional (QEP)
Professional Memberships	**Air & Waste Management Association** - Past Chairman, Past Vice Chairman, and Past Board of Directors of North Texas Chapter and Southwest Section; Past Chairman, Consultants Committee; Past Chairman, Source Measurement Committee **Source Evaluation Society** - Past President, Past Board of Directors **American Management Association**

MULLINS

Publications

Authored "Real World Experience with USEPA's New Sampling and Analytical Methods for Conducting Risk Burn," - May 1998.

Co-authored "Sulfur Compound Emissions of the Petroleum Production Industry," December 1974.

Co-authored "Field Procedure for Stabilizing Hydrogen Sulfide Samples to be Analyzed Using Modified Methylene Blue Technique," presented at the Conference on Ambient Air Quality Measurements, Austin, Texas, March 1975.

Co-authored "Atmospheric Emissions Survey of the Sour Gas Industry," October 1975.

Co-authored "Technique for Insuring the Validity of Samples for High Concentrations of Sulfur Dioxide Using the EPA Method 5 Sampling Train," presented at the Third National Conference on Energy and the Environment, College Corner, Ohio, September 1975.

Teaching Experience

Conducted training seminars on sampling methods periodically since 1974 to present.

Conducted a one-day seminar on Part 75 Testing over ten times in 1993 and 1994.

Served as a lecturer in the Environmental Protection Agency's training course number 450, "Source Sampling for Particulate Pollutants," for two years from January 1974 to October 1975 and in March, 1992.

Conducted a two-day training course entitled "Technical Assistance in Source Sampling" at Iowa State University, Ames, Iowa, for the Environmental Protection Agency, October 1974.

MULLINS

Teaching Experience (Cont'd)

Conducted EPA's training course number 450, "Source Sampling for Particulate Pollutants," for the EPA at Research Triangle Park, North Carolina, September 1975.

Conducted a two-day short course entitled "Performing and Observing Source Sampling" at Dallas, Texas; July 1976, May 1977, October 1977, November 1987 and November 1988; at Lake Charles, Louisiana, May 1977; at Casper, Wyoming, May 1977; and at Point Comfort, Texas, November 1992.

Served as a lecturer in the Environmental Protection Agency's two-day seminar entitled "Asphalt Industry Environmental Solutions," presented in Dallas, Texas, on March 21 and 22, 1979.

Conducted a two-day short course entitled "Performing and Observing Source Sampling" in Phoenix, Arizona in August, 1990 for the State of Arizona, Department of Environmental Quality; in Lincoln, Nebraska, in March 1980 for the State of Nebraska, Air Quality Control Division.

Technical Experience

Directed and performed stack sampling on over 2000 sources of which over 500 were sampled simultaneously using more than one sampling train at several points in the flue gas stream; 1972-present.

Directed and performed over 200 short-term ambient air studies using mobile sampling vans and various ambient air sampling equipment; 1972-present.

Designed, directed and operated over 20 permanent ambient air networks of various size and duration for a variety of parameters; 1972-present.

Designed surface and underground drainage systems for residential subdivisions, public works projects, and shopping centers; 1969-1972.

MULLINS

Designed several residential subdivisions including lot layout, street design, drainage design, and utility design; 1969-1972.

Research Projects

Supervised and conducted a study made by the Hawaiian Sugar Planters' Association to characterize the emissions for several bagasse-fired boilers. April-May 1976.

Supervised and conducted a study made by the Rio Grande Valley Sugar Growers, Inc. to determine the area affected by the burning of sugarcane fields prior to harvesting. November 1974-April 1975.

Supervised and conducted a study by a lightweight aggregate manufacturer to develop a material balance around the process through sampling and analysis of several parameters. November 1973.

Conducted a study in New York City to attempt to develop a correlation in the ambient air between carbon dioxide and sulfur dioxide to provide a tool for predicting air pollution episodes. January-May 1969.

Related Projects

Served as Chairman of the Engineering Foundation Conference on Stack Sampling and Source Evaluation in Santa Barbara, California, 1985.

Served as Session Chairman at the Engineering Foundation Conference on Stack Sampling and Source Evaluation in Hershey, Pennsylvania, 1984; in San Diego, California, 1993; and in Palm Coast, Florida, 1994.

BILLY L. HEFLEY; Project Supervisor II

Education	B.S. 1991, East Central University; Ada, Oklahoma, in Environmental Science with a concentration in Environmental Management.
Professional Training Course	Attended 40-hour Occupational and Environmental Training Program on Hazardous Materials (CFR 1910.120) Dallas, Texas, April 1993. Also attended an 8-hour refresher course January 1994, February 1995, and January 1996. Attended 8-hour Safe Hazardous Materials Transportation Training Program (HM-126F and HM-181) Dallas, Texas, October 1994. Attended Bill Mullins' Performing and Observing Source Sampling Short Course; Dallas, Texas, January 1995.
Certification	Certified Visible Emissions Evaluator
Technical Experience	Participated in the sampling of over 150 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1992-present. Participated in an auditing program for a permanent eight-station sulfur dioxide ambient air network in East Texas. 1992-1993. Participated in a semi-monthly ambient air monitoring survey for organic compounds at a petrochemical facility located in South Texas. 1992-1993.

HEFLEY

Thoroughly trained in all EPA testing procedures, 1991 - Present

Experienced in the analysis of commercial calibration gas cylinders for CO_2, O_2, NO_x, and SO_2.

Experienced with calibration techniques for all field testing equipment.

Thoroughly trained in the operation and routine maintenance of the following:

Thermo Environmental Model 10AR Oxides of Nitrogen Analyzer

Thermo Environmental Model 48 Carbon Monoxide Analyzer

Teledyne Model 326 Oxygen Analyzer

Western Research Model 721A Sulfur Dioxide Analyzer

Anarad Model AR880 Oxides of Nitrogen Analyzer

Anarad Model AR23 Oxygen Analyzer

Anarad Model AR30C2 Sulfur Dioxide Analyzer

Anarad Model AR50-C Carbon Dioxide Analyzer

SHANE LEE; Environmental Technician II

Education	B. S. - Environmental Science-Biology, December 20, 1997; Sul Ross State University; Alpine, Texas.
Technical Experience	Participated in the sampling of over 50 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1998-Present.

MICHAEL BASS; Environmental Technician II

Education	B. S. Geography, August 1998; Texas A&M University, College Station, Texas
Technical Experience	Participated in the sampling of over 50 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1998-Present.

SCOTT HART; Environmental Technician I

Education	Associate Degree-Environmental Science, March 1999; Texas State Technical College, Breckenridge, Texas
Technical Experience	Participated in the sampling of over 25 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA procedures, 1999-Present.

JASON CONWAY; Environmental Technician I

Education	B.S. Biology, July 1999; Southeastern Oklahoma State University; Durant, Oklahoma.
Technical Experience	Participated in the sampling of over 25 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1999-Present.

JASON BROWN; Environmental Technician I

Education	B. S. in Zoology, 1995; University of Oklahoma, Norman, Oklahoma.
Technical Experience	Participated in the sampling of over 25 sources, including several of which were sampled simultaneously using more than one sampling train. Thoroughly trained in all EPA testing procedures, 1999-Present.