APPENDIX A
DETAILED TEST DATA AND TEST RESULTS

TABLE A-1
TEC - POLK POWER STATION
SUMMARY OF MERCURY SPECIATION TEST DATA AND TEST RESULTS
UNIT NO. 1 STACK

TEST DATA:								
Test run number		1		2		3		
Location		Unit No. 1 Stack		Unit No. 1 Stack		Unit No. 1 Stack		
Test date		11/2/99		11/2/99		11/2/99		
Test time period		0755-1043		1200-1525		1654-1948		
PROCESS DATA:								
Unit Load, Total MW		318		318		317		
Combustion Turbine, MW		191		191		191		
Steam Turbine, MW		127		127		126		
Coal feed rate, Klb/hr.		224		219		177		
Coal Btu content, Btu/lb.		10770		11550		11520		
Heat Input, 10^6 Btu/hr		2408		2531		2041		
SAMPLING DATA:								
Sampling duration, min.		120.0		120.0		120.0		
Nozzle diameter, in.		0.196		0.191		0.196		
Cross sectional nozzle area, sq.ft.		0.000210		0.000199		0.000210		
Barometric pressure, in. Hg		29.53		29.50		29.53		
Avg. orifice press. diff., in H_2O		1.50		1.40		1.44		
Avg. dry gas meter temp., deg F		79.5		80.5		75.0		
Avg. abs. dry gas meter temp., deg. R		540		541		535		
Total liquid collected by train, ml		122.9		116.0		117.0		
Std. vol. of H_2O vapor coll., cu.ft.		5.8		5.5		5.5		
Dry gas meter calibration factor		0.9961		0.9961		0.9961		
Sample vol. at meter cond., dcf		77.926		76.643		76.760		
Sample vol. at std. cond., dscf [1]		75.224		73.759		74.708		
Percent of isokinetic sampling		100.8		102.4		101.2		
Sample vol. at std. cond., dscm [1]		2.130		2.089		2.115		
GAS STREAM COMPOSITION DATA:								
CO_2, % by volume, dry basis		8.1		7.9		8.3		
O_2, % by volume, dry basis		12.2		11.6		11.9		
N_2, % by volume, dry basis		79.7		80.5		79.8		
Molecular wt. of dry gas, lb/lb mole		29.78		29.73		29.80		
H_2O vapor in gas stream, prop. by vol.		0.071		0.069		0.069		
Mole fraction of dry gas		0.929		0.931		0.931		
Molecular wt. of wet gas, lb/lb mole		28.94		28.92		28.99		
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:								
Static pressure, in. H_2O		-1.00		-1.10		-0.85		
Absolute pressure, in. Hg		29.46		29.42		29.47		
Avg. temperature, deg. F		340		342		340		
Avg. absolute temperature, deg.R		800		802		800		
Pitot tube coefficient		0.84		0.84		0.84		
Total number of traverse points		24		24		24		
Avg. gas stream velocity, ft./sec.		82.0		83.4		80.8		AVERAGE
Stack/duct cross sectional area, sq.ft.		283.529		283.529		283.529		
Avg. gas stream volumetric flow, wacf/min.		1395491		1419237		1374791		1396506
Avg. gas stream volumetric flow, dscf/min. [1]		841784		855572		832285		843214
MERCURY LABORATORY REPORT DATA:								
Particulate bound, ug	<	0.0200	<	0.0200	<	0.0200		
Oxidized, ug		0.8300		0.6400		0.2700		
Elemental, ug		7.5600		7.4200		7.5100		
Total catch, ug[3]		8.4100		8.0800		7.8000		
PARTICULATE BOUND MERCURY EMISSIONS:								
Conc., ug/m^3	<	0.01	<	0.01	<	0.01	<	0.009
Conc., ug/Nm^3 [2]	<	0.01	<	0.01	<	0.01	<	0.010
Emission rate, $lbs/10^{12}$ Btu.	<	0.01	<	0.01	<	0.01	<	0.01
Emission rate, lbs/hr	<	2.96E-05	<	3.07E-05	<	2.95E-05	<	2.99E-05
OXIDIZED MERCURY EMISSIONS:								
Conc., ug/m^3		0.39		0.31		0.13		0.27
Conc., ug/Nm^3 [2]		0.42		0.33		0.14		0.29
Emission rate, $lbs/10^{12}$ Btu.		0.51		0.39		0.19		0.36
Emission rate, lbs/hr		1.23E-03		9.82E-04		3.98E-04		8.69E-04
ELEMENTAL MERCURY EMISSIONS:								
Conc., ug/m^3		3.55		3.55		3.55		3.55
Conc., ug/Nm^3 [2]		3.81		3.81		3.81		3.81
Emission rate, $lbs/10^{12}$ Btu.		4.65		4.50		5.42		4.86
Emission rate, lbs/hr		1.12E-02		1.14E-02		1.11E-02		1.12E-02
TOTAL MERCURY EMISSIONS: [3]								
Conc., ug/m^3		3.95		3.87		3.69		3.83
Conc., ug/Nm^3 [2]		4.24		4.15		3.96		4.11
Emission rate, $lbs/10^{12}$ Btu.		5.17		4.90		5.63		5.23
Emission rate, lbs/hr		1.24E-02		1.24E-02		1.15E-02		1.21E-02

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 inches Hg (760mm Hg).
(2) Nm3 = Normal cubic meter (32 deg. F. (0 deg. C.) and 29.92 inches Hg (760mm Hg)).
(3) Non-detects included in total mercury catch value.

APPENDIX B
PROCESS OPERATIONS, AND FACILITY CEMS DATA

TAMPA ELECTRIC COMPANY-- POLK POWER STATION MONITORED PARAMETERS

PARAMETERS	CT[1]	ST[2]	GROSS[3] GENERATION	NET[3] GENERATION	MAIN STEAM FLOW	MAIN STEAM TEMP	CEM SO2		CEM NOx	
UNITS	MW	MW	MW	MW	LB/HR	DEG F	PPM	LB/mmBTU	PPM	LB/mmBTU
DATE/TIME										
02-Nov-99 00:00:00	190.6	127.7	318.3	249.7	678868.50	999.2	34.10	0.16	24.00	0.081
02-Nov-99 01:00:00	190.6	128.1	318.7	249.4	681634.38	999.1	37.30	0.18	23.10	0.079
02-Nov-99 02:00:00	190.6	128.0	318.6	249.5	681955.31	1000.1	42.80	0.20	22.90	0.077
02-Nov-99 03:00:00	190.7	127.9	318.6	249.8	683217.50	1000.3	43.00	0.20	22.90	0.076
02-Nov-99 04:00:00	190.8	127.9	318.7	249.5	682608.19	1000.2	48.60	0.22	22.60	0.075
02-Nov-99 05:00:00	190.7	127.6	318.3	249.3	681390.06	1000.0	48.20	0.22	22.70	0.075
02-Nov-99 06:00:00	190.6	126.9	317.5	249.0	679779.06	1000.0	42.80	0.20	23.00	0.077
02-Nov-99 07:00:00	190.6	126.9	317.5	248.6	677466.69	1000.4	37.80	0.17	23.50	0.078
02-Nov-99 08:00:00	190.7	126.7	317.4	248.9	676316.56	1000.1	34.10	0.16	24.30	0.082
02-Nov-99 09:00:00	190.9	126.8	317.7	250.3	678047.56	1000.8	33.80	0.16	24.80	0.083
02-Nov-99 10:00:00	190.7	127.1	317.8	250.6	679093.63	1000.9	33.30	0.16	24.90	0.085
02-Nov-99 11:00:00	190.6	126.9	317.5	250.0	679651.13	1001.1	37.80	0.18	24.90	0.084
Average (Run 1)	**190.7**	**126.9**	**317.6**	**249.9**	**678277.2**	**1000.7**	**34.8**	**0.2**	**24.7**	**0.1**
02-Nov-99 12:00:00	190.8	127.3	318.1	249.6	681558.38	1001.0	37.60	0.18	25.00	0.084
02-Nov-99 13:00:00	190.6	128.0	318.6	248.9	685064.50	1001.0	48.70	0.22	23.90	0.079
02-Nov-99 14:00:00	190.6	127.1	317.7	248.3	680732.94	1001.1	44.00	0.21	24.20	0.081
02-Nov-99 15:00:00	190.8	126.6	317.4	249.3	677520.13	1001.2	36.80	0.17	24.50	0.083
02-Nov-99 16:00:00	190.8	126.3	317.1	249.2	675520.50	1001.3	32.00	0.15	25.00	0.084
Average (Run 2)	**190.7**	**127.0**	**317.8**	**249.1**	**680079.3**	**1001.1**	**39.8**	**0.2**	**24.5**	**0.1**
02-Nov-99 17:00:00	190.7	125.9	316.6	248.7	672830.75	1001.2	24.60	0.12	24.80	0.083
02-Nov-99 18:00:00	190.9	125.8	316.7	248.3	673023.56	1001.0	23.30	0.11	25.10	0.084
02-Nov-99 19:00:00	190.6	125.8	316.4	248.1	671131.25	1000.9	22.10	0.10	25.10	0.084
02-Nov-99 20:00:00	191.1	126.0	317.1	248.1	672179.00	1000.9	22.60	0.11	24.80	0.083
Average (Run 3)	**190.8**	**125.9**	**316.7**	**248.3**	**672291.1**	**1001.0**	**23.2**	**0.1**	**25.0**	**0.1**
02-Nov-99 21:00:00	191.1	126.0	317.1	248.1	671824.44	1000.8	22.00	0.10	24.50	0.082
02-Nov-99 22:00:00	191.1	126.1	317.2	248.1	671202.50	1001.0	21.90	0.10	24.80	0.083
02-Nov-99 23:00:00	191.1	126.0	317.1	248.1	670663.75	1000.7	21.40	0.10	24.80	0.083

(1) Combustion Turbine
(2) Steam Turbine
(3) No additional firing--thus, no emission associated with MWs
(4) ST and CT

TAMPA ELECTRIC COMPANY-- POLK POWER STATION MONITORED PARAMETERS

PARAMETERS	CEM ACQ	STACK OPACITY	STACK FLOW	SYNGAS MASS FLOW	SYNGAS PRESSURE	N2 MASS FLOW	COAL HHV	SYNGAS LOWER HEATING VALUE
UNITS	%	%	KSCFH	LB/SEC	PSI	LB/SEC	BTU/LB	BTU/SCF
DATE/TIME								
02-Nov-99 00:00:00	8.20	0.00	57174	104.30	196	120.43	12733	248.75
02-Nov-99 01:00:00	8.10	0.00	57066	104.65	196	120.82	12733	241.62
02-Nov-99 02:00:00	8.20	0.00	57570	104.91	196	121.21	12733	239.95
02-Nov-99 03:00:00	8.30	0.00	56850	104.83	196	121.59	12733	240.12
02-Nov-99 04:00:00	8.30	0.00	55566	104.84	196	121.98	12733	240.25
02-Nov-99 05:00:00	8.30	0.83	56862	104.55	196	122.34	12733	240.38
02-Nov-99 06:00:00	8.20	1.62	56634	104.20	196	122.07	12733	240.72
02-Nov-99 07:00:00	8.30	1.68	56538	104.10	197	121.53	12733	241.34
02-Nov-99 08:00:00	8.20	1.75	56454	103.93	197	121.00	12733	241.67
02-Nov-99 09:00:00	8.20	1.77	56364	104.02	197	120.46	12733	241.68
02-Nov-99 10:00:00	8.10	0.45	57450	104.00	197	120.28	12733	241.73
02-Nov-99 11:00:00	8.20	0.47	57180	104.12	197	121.36	12733	241.68
Average (Run 1)	**8.2**	**1.1**	**56862.0**	**104.0**	**197.0**	**120.8**	**12733.0**	**241.7**
02-Nov-99 12:00:00	8.20	0.49	56292	104.34	197	122.33	12733	241.58
02-Nov-99 13:00:00	8.30	0.51	56286	104.72	197	122.58	12733	240.31
02-Nov-99 14:00:00	8.20	0.79	55632	104.23	197	122.77	12733	240.66
02-Nov-99 15:00:00	8.10	1.40	55140	103.98	196	122.96	12733	241.28
02-Nov-99 16:00:00	8.20	1.21	55908	103.76	196	123.15	12733	242.06
Average (Run 2)	**8.2**	**0.9**	**55851.6**	**104.2**	**196.6**	**122.8**	**12733.0**	**241.2**
02-Nov-99 17:00:00	8.20	1.02	56292	103.49	196	123.34	12733	242.49
02-Nov-99 18:00:00	8.20	0.83	57204	103.37	196	123.49	12733	242.55
02-Nov-99 19:00:00	8.20	0.64	57192	103.39	196	123.59	12733	242.62
02-Nov-99 20:00:00	8.20	0.45	56178	103.58	196	123.69	12733	242.68
Average (Run 3)	**8.2**	**0.7**	**56716.5**	**103.5**	**195.8**	**123.5**	**12733.0**	**242.6**
02-Nov-99 21:00:00	8.20	0.26	56472	103.71	196	123.80	12733	242.75
02-Nov-99 22:00:00	8.20	0.07	55998	103.72	196	123.92	12733	242.81
02-Nov-99 23:00:00	8.20	0.00	56442	103.61	197	124.36	12733	242.91

(1) Combustion Turbine
(2) Steam Turbine
(3) No additional firing--thus, no emission associated with MWs
(4) ST and CT

TAMPA ELECTRIC COMPANY-- POLK POWER STATION MONITORED PARAMETERS

PARAMETERS		COAL WEIGHT EDR B CONT MNL	COAL WEIGHT EDR A CONT MNL	COAL WEIGHT TOTAL	COAL WEIGHT RATE
UNITS		KLB/HR	KLB/HR	KLB	KLB/HR
DATE	TIME				
02-Nov-99 01:00:00	00:00-01:00	102.68	120.84		
02-Nov-99 02:00:00	01:00-02:00	102.68	120.63		
02-Nov-99 03:00:00	02:00-03:00	102.85	121.20		
SUM (RUN1)		**308.21**	**362.67**	**670.88**	**223.63**
02-Nov-99 05:00:00	04:00-05:00	102.66	120.72		
02-Nov-99 06:00:00	05:00-06:00	102.77	120.74		
02-Nov-99 07:00:00	06:00-07:00	100.26	120.81		
02-Nov-99 08:00:00	07:00-08:00	87.71	120.91		
SUM (RUN 2)		**393.40**	**483.18**	**876.58**	**219.14**
02-Nov-99 10:00:00	09:00-10:00	25.08	121.11		
02-Nov-99 11:00:00	10:00-11:00	PI-API error: -11059	121.48		
02-Nov-99 12:00:00	11:00-12:00	87.25	120.88		
SUM (RUN3)		**112.33**	**241.98**	**354.32**	**177.16**

APPENDIX C
RAW TEST DATA

TABLE A-1
TEC - POLK POWER STATION
ONTARIO HYDRO METHOD DATA INPUTS
UNIT NO. 1 STACK

Test Data						
Run number		1		2		3
Location		Unit No. 1 Stack		Unit No. 1 Stack		Unit No. 1 Stack
Date		11/2/99		11/2/99		11/2/99
Time period		0755-1043		1200-1525		1654-1948
Operator		JP/PG		JP/PG		JP/PG
Process Data						
Unit Load, Total MW		318		318		317
Combustion Turbine, MW		191		191		191
Steam Turbine, MW		127		127		126
Coal feed rate, Klb/hr.		224		219		177
Coal Btu content, Btu/lb.(as received)		10770		11550		11520
Heat Input, 10^6 Btu/hr		2408		2531		2041
Inputs For Calcs.						
Sq. rt. delta P		1.179314		1.19693		1.16321
Delta H		1.50083		1.40333		1.44083
Stack temp. (deg.F)		339.88		341.50		339.67
Meter temp. (deg.F)		79.52		80.50		75.04
Sample volume (act.)		77.926		76.643		76.760
Barometric press. (in.Hg)		29.53		29.50		29.53
Volume H_2O imp. (ml)		106.0		97.5		98.8
Weight chnge sil. gel (g)		16.9		18.5		18.2
% CO_2		8.1		7.9		8.3
% O_2		12.2		11.6		11.9
% N		79.7		80.5		79.8
Area of stack (sq.ft.)		283.529		283.529		283.529
Sample time (min.)		120.00		120.00		120.00
Static pressure (in.H_2O)		-1.00		-1.10		-0.85
Nozzle dia. (in.)		0.196		0.191		0.196
Meter box cal.		0.9961		0.9961		0.9961
Cp of pitot tube		0.84		0.84		0.84
Traverse points		24		24		24
Mercury Laboratory Report Data						
Particulate bound, ug	<	0.0200	<	0.0200	<	0.0200
Oxidized, ug		0.8300		0.6400		0.2700
Elemental, ug		7.5600		7.4200		7.5100
Total mercury catch, ug		8.4100		8.0800		7.8000

Note: Non-detects included in total mercury catch value.

Sample and Velocity Traverse Point Data Sheet - Method 1

Client TECO
Loaction/Plant POLK
Source

Operator MILLS
Date 11/1/99
W.O. Number

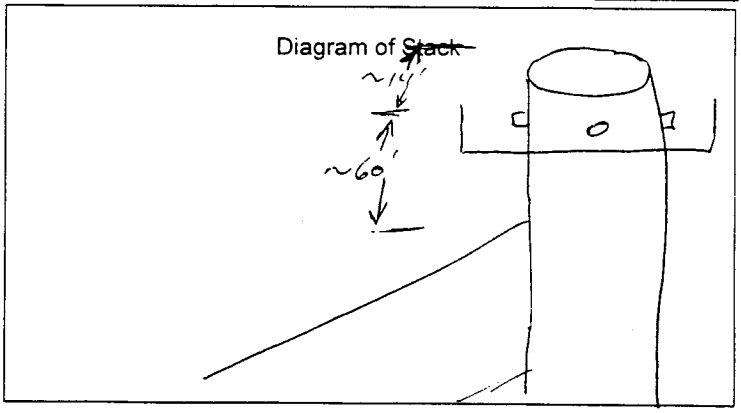
Duct Type ☒ Circular ☐ Rectangular Duct — Indicate appropriate type
Traverse Type ☐ Particulate Traverse ☐ Velocity Traverse

Distance from far wall to outside of port (in.) = C	242
Port Depth (in.) = D	14
Depth of Duct, diameter (in.) = C-D	228
Area of Duct (ft²)	283.53
Total Traverse Points	24
Total Traverse Points per Port	6

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

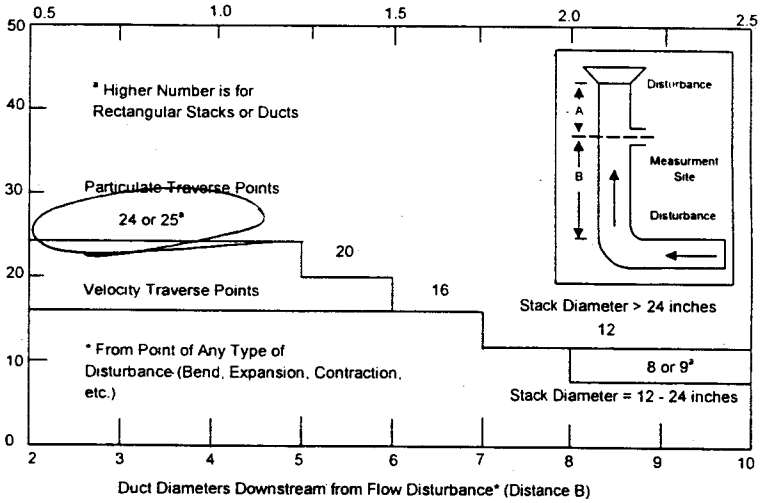
Flow Disturbances	
Upstream - A (ft)	14 FT
Downstream - B (ft)	~60 FT
Upstream - A (duct diameters)	~3
Downstream - B (duct diameters)	~0.7

Diagram of Stack



Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)	
1	.021	4.788	18.788	18 3/4
2	.067	15.276	29.276	29 1/4
3	.118	26.904	40.904	40 7/8
4	.177	40.356	54.356	54 3/8
5	.250	57	71	71
6	.356	81.168	95.168	95 1/8
7				
8				
9				
10				
11				
12				



Equivalent Diameter = (2*L*W)/(L+W)

Traverse Point Location Percent of Stack -Circular

Number of Traverse Points

Traverse Point	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Number of Traverse Points

Traverse Point	1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

Rectangular Stack Points & Matrix
9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

WESTON MANAGERS DESIGNERS CONSULTANTS

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Determination of Stack Gas Velocity - Method 2

Client TECC
Location/Plant POLK STATION FL
Source TURBINE STACK

Operator JPG
Date 11/19/96
W.O. Number

Pitot Coeff (Cp) 0.82
Stack Area, ft² (As)
Pitot Tube/Thermo ID P112

Run Number	PRECIM		
Time	1445		
Barometric Press, in Hg (Pb)	29.53		
Static Press, in H_2O (Pstatic)	-1C		
Source Moisture, % (BWS)	2.7		
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? (Y)N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
.01	<5	A	1	1.5	341				
.02	5		2	1.6	342				
.01	<5		3	1.5	348				
<.01	<5		4	1.8	353				
<.01	<5		5	1.8	353				
.03	<5		6	1.4	357				
<.01	<5	B	1	1.5	346				
<.01	<5		2	1.5	341				
<.01	<5		3	1.5	353				
.02	5		4	1.6	356				
.02	5		5	1.7	354				
.01	5		6	1.4	353				
.01	<5	C	1	1.3	340				
.02	5		2	1.3	357				
.02	5		3	1.4	356				
<.01	5		4	1.4	356				
<.01	<5		5	1.5	354				
<.01	5		6	1.4	354				
<.01	<5	D	1	1.4	340				
<.01	<5		2	1.5	335				
.02	5		3	1.5	345				
.01	<5		4	1.6	348				
<.01	<5		5	1.7	348				
			6	1.4	348				
Avg Angle		Avg Delta P & Temp		1.53	349				
		avg $\sqrt{DeltaP}$		1.226					
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$$

$$Tsa = Ts + 460$$

$$Ps = Pb + (Pstatic/13.6)$$

$$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$$

$$Qs(act) = 60 * Vs * As$$

$$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$$

Comments _____

where:
MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual,
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

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Determination of Moisture Content in Stack Gases - Method 4

Client TECO
Location/Plant POLK STATION, FL Operator JP | PC Date 11/1/97
Source TURBINE STACK Meter Box ID 15 Meter Box Y 0.9961
W.O. Number _____ Temperature °C or °F F° Sample Volume, ft³ or L 573

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
PRELIM										Initial .006 @ 10"
	End Test	15.15	717.912	94	92	1.7	226	309.2		Final ____
Baro Press., Pb (in Hg)	Start Test	1440	693.501	90	88	1.7	200	300	Moisture Volume, Vw(std)	Percent Moisture (%), BWS
29.53	Avg. or Total	55	24.411	92.25		1.7	26	9.2		6.71

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
										Initial ____
	End Test									Final ____
Baro Press., Pb (in Hg)	Start Test								Moisture Volume, Vw(std)	Percent Moisture (%), BWS
	Avg. or Total									

Run Number		Sample Time (min)	Meter Volume, Vm	Meter Temp (or ambient temp for rotometer) Inlet	Outlet	Meter Press, Delta H (in H_2O)	Impinger Volume, ml	Silica Gel Weight, g	Corrected Volume, Vm(std)	Leak Rate Check
										Initia ____
	End Test									Final ____
Baro Press., Pb (in Hg)	Start Test								Moisture Volume, Vw(std)	Percent Moisture (%), BWS
	Avg. or Total									

$$Vm(std) = \frac{17.64 * Y * Vm * (Pb + (deltaH / 13.6))}{(Tm + 460)}$$

if Tm is C° than $Tm = (Tmc * 1.8) + 32$

if Vm is liters than $Vm = Vml * 28.32$

$$Vw(std) = (0.04707 * Vwc) + (0.04715 * Wwsg)$$

$$BWS = \left(\frac{Vw(std)}{Vw(std) + Vm(std)} \right) * 100$$

WHERE:
Vm(std)= Sample volume corrected to standard temp and pressure, scf or L
Vm= Actual sample volume, calculated, scf
Vml= Actual sample volume, calculated, Liters
Y= Dry gas meter calibration factor.
Pb= Barometric pressure, in. Hg
delta H= Meter pressure, in H2O
Tm= Average temperature of meter (DGM is used) or rotomter, degrees °
Tmc= Average temperature of meter (DGM is used) or rotomter, degrees °
Vw(std)= Volume of water vapor at standard conditions, scf or L
Vwc= Volume of water condensed, mL
Wwsg= Weight of Silica Gel, g
Bws= Water vapor in gas stream, percen

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Use either ft³ or liters in calculations. DO NOT MIX CUBIC FEET AND LITERS IN ANY CALCULATION.

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ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Page 1 of 2

		Stack Conditions	Assumed	Actual
Client	TAMPA ELECTRIC			
W.O.#	12281.001.001.0001			
Project ID	TECO ~~PK~~	% Moisture	~~7 6 7~~ JP	
Mode/Source ID	~~UNIT 3~~ UNIT	Impinger Vol (ml)		
Samp. Loc. ID	~~FOD IN~~ STK	Silica gel (g)		
Run No.ID	1	CO2, % by Vol	2	
Test Method ID	OHM	O2, % by Vol	10	
Date ID	1NOV1999	Temperature (°F)	JP 95 345	
Source/Location	UNIT 3 ~~FOD IN STK~~	Meter Temp (°F)	JP 95 85	
Sample Date	11/2/99	Static Press (in H_2O)	-1.0	
Baro. Press (in Hg)	29.53			
Operator	JP / PM	Ambient Temp (°F)	78	

		Leak Checks	Initial	Mid-Point	Final
Meter Box ID	15	Sample Train (ft^3)	.008		.009
Meter Box Y	0.9961	Leak Check @ (in Hg)	15		4
Meter Box Del H	2.0355	Pitot good	(yes) / no	yes / no	(yes) / no
Probe ID / Length	9'	Orsat good	(yes) / no	yes / no	(yes) / no
Probe Material	Boro				
Pitot / Thermocouple ID	P302				
Pitot Coefficient	0.84				
Nozzle ID	0.196	**Temp Check**	Pre-Test Set		Post-Test Set
Avg Nozzle Dia (in)	0.196	Meter Box Temp	72		78
Area of Stack (ft^2)	293.56	Reference Temp	70.3		76.5
Sample Time	120	Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
Total Traverse Pts	24	Temp Change Response	(yes) / no		(yes) / no

K Factor 1.08

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	0755			718.122									
D 2	5		1.3	1.40	721.3	338	77	75	253	253	65	4.5		
3	10		1.5	1.62	724.8	342	80	76	253	253	64	4.5		
4	15		1.5	1.62	727.9	342	82	76	250	247	59	4.5		
5	20		1.4	1.51	731.3	342	75	84	250	247	59	4.5		
6	25		1.4	1.51	734.7	341	84	78	255	249	60	5.0		
D	30	0825	1.3	1.40	737.850	340	85	79	256	255	60	5.0		19.728
~~5~~ 4	~~35~~ 35					L.C good @ 10 in Hg								
~~6~~ 4	~~40~~ 40	~~0835~~ 0835			~~738.060~~ 738.060									
C 1	45	0840			738.068									
2	50 5		1.4	1.51	741.3	339	81	78	254	248	65	5.0		
3	10		1.3	1.40	744.6	341	84	79	250	263	62	5.0		
4	15		1.4	1.51	74.7	339	79	75	251	262	58	5.0		
5	20		1.3	1.40	751.0	341	80	76	255	260	61	4.5		
6	25		1.3	1.40	754.2	341	81	77	255	260	64	4.0		
	30		1.3	1.40	757.446	331	81	77	255	260	66	4.0		19.379
						L.C good @ 10 in Hg								
B 1	0	0927			757.668									
2	5		1.4	1.51	761.0	341	79	78	265	260	65	4.5		
3	10		1.5	1.62	764.1	340	80	78	265	260	67	4.5		
4	15		1.4	1.51	767.3	341	81	78	262	267	60	4.5		
5	20		1.4	1.51	770.8	342	82	78	261	268	60	4.5		
6	25		1.3	1.40	774.1	342	83	79	262	265	60	4.5		
	30	0957	1.5	1.62	776.727	340	84	79	262	265	62	5.0		19.225
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	

Avg Sqrt Del H

Comments:

Ontario Hydro Method

WESTON MANAGERS DESIGNERS/CONSULTANTS

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Client: TAMPA ELECTRIC
Source: UNIT 1
Sample Loc.: ~~FGD IN~~ Stack
Operator: JP/PW
Run No.: 1
Date: 11/2/99
K Factor: 1.08

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (In H2O)	ORIFICE PRESSURE Delta H (In H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (In Hg)		COMMENTS
	0	1013			777.723									
A 2	5		1.4	1.57	781.0	335	81	79	260	260	65	4.0		
3	10		1.4	1.51	784.2	341	81	78	263	259	61	4.5		
[illegible]	15		1.4	1.51	787.5	340	81	78	260	260	61	4.5		
5	20		1.4	1.51	790.9	341	81	78	261	259	61	4.5		
6	25		1.5	1.62	774.1	340	83	78	263	260	65	4.5		
	30	1043	1.4	1.51	777.288	337	83	78	263	259	65	4.5		19.565

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
1.179314	1.50083	~~77.896~~	339.87	79.52	250/265	247/268	67	5	

Avg Sqrt Del H:

Comments: 77.926 WF

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ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Client	TAMPA ELECTRIC		Stack Conditions	Assumed	Actual	Meter Box ID	15			K Factor	0.98
W.O.#	12281.001.001.0001					Meter Box Y	.9561			Initial	Mid-Point / Final
Project ID	TECO~~PK~~	% Moisture		7		Meter Box Del H	2.0355	Leak Checks			
Mode/Source ID	UNIT 1	Impinger Vol (ml)				Probe ID / Length	6 9'	Sample Train (ft^3)		.008	.008
Samp. Loc. ID	~~STACK FGD IN~~	Silica gel (g)				Probe Material	Boro	Leak Check @ (in Hg)		15	60
Run No.ID	2	CO2, % by Vol		8		Pitot / Thermocouple ID	P300	Pitot good		(yes) / no	(yes) / no
Test Method ID	OHM	O2, % by Vol		8.12		Pitot Coefficient	0.84	Orsat good		(yes) / no	(yes) / no
Date ID	1NOV1999	Temperature (°F)		348		Nozzle ID	6.191	Temp Check		Pre-Test Set	Post-Test Set
Source/Location	UNIT 1 ~~FGD IN STACK~~	Meter Temp (°F)		90		Avg Nozzle Dia (in)	@ 0.191	Meter Box Temp		77	78
Sample Date	11/2/99	Static Press (in H_2O)		-1.0	-1.1	Area of Stack (ft^2)	293.56	Reference Temp		75.7	76.5
Baro. Press (in Hg)	29.50					Sample Time	120	Pass/Fail (+/- 2°)		(Pass) / Fail	(Pass) / Fail
Operator	JD/PG	Ambient Temp (°F)		79		Total Traverse Pts	24	Temp Change Response		(yes) / no	(yes) / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (In Hg)		COMMENTS
	0	1200			797.640									
2	5		1.5	1.47	801.0	338	83	81	265	265	65	3.5		
3	10		1.4	1.37	804.1	342	84	81	260	260	65	3.5		
4	15		1.5	1.47	807.4	342	83	80	259	258	64	3.5		
5	20		1.4	1.37	810.6	342	84	81	261	262	65	3.5		
6	25		1.4	1.37	~~808~~ 813.7	341	83	86	261	261	66	3.5		
	30	1230	1.4	1.37	816.924	340	83	80	259	266	66	3.5		19.294
						L.C good @ 10 in Hg								
B1	0	1255			817.265									
2	5		1.5	1.47	820.5	340	79	79	260	260	66	3.5		
3	10		1.5	1.47	823.8	343	82	80	260	261	66	3.5		
4	15		1.5	1.47	827.1	342	82	79	261	262	61	3.5		
5	20		1.5	1.47	830.3	342	82	80	262	266	62	3.5		
6	25		1.5	1.47	833.6	343	81	80	261	265	63	3.5		
	30	1325	1.5	1.47	836.858	342	81	80	260	265	63	3.5		19.593
						L.C good @ 10 in Hg								
C1	0	1400	~~1.4~~	~~1~~	837.191									
2	5		1.4	1.37	839.9	342	79	79	260	265	65	3.5		
3	10		1.3	1.27	843.9	343	81	80	260	264	60	3.5		
4	15		1.5	1.47	846.4	341	81	78	261	264	60	3.5		
5	20		1.5	1.47	849.7	342	80	79	260	265	61	3.5		
6	25		1.4	1.37	853.0	343	80	79	260	264	63	3.5		
	30		1.4	1.37	856.117	341	80	79	254	262	65	3.5		18.926
			Avg Sqrt Delta P	Avg Delta H	Total Volume ~~X~~	Avg Ts	Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	

Avg Sqrt Del H

Comments: L.C good @ 10 in Hg

WESTON MANAGERS DESIGNERS/CONSULTANTS

Ontario Hydro Method

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Client: TAMPA ELECTRIC
Source: UNIT 1
Sample Loc.: ~~FGD IN~~ Stack
Operator: JP/PG
Run No.: 2
Date: 11/2/99
K Factor: .98

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1455			856.290									
2	5		1.4	1.37	859.4	342	79	78	260	264	68	3.5		
3	10		1.4	1.37	862.6	342	80	79	260	264	63	3.5		
4	15		1.4	1.37	865.7	342	80	79	261	264	62	3.5		
5	20		1.4	1.37	868.9	341	81	79	261	264	62	3.5		
6	25		1.4	1.37	872.0	341	81	79	262	268	63	3.5		
	30	1525	1.3	1.27	875.120	339	81	79	260	267	64	3.5		18.830

Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
1.196433	1.4033	76.643	~~342~~ 341.5	80.5	254/265	258/268	68	3.5	

Avg Sqrt Del H: 1.1843

Comments: VTB

VTB

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JPM TB

ISOKINETIC FIELD DATA SHEET

Ontario Hydro Method - Mercury

Client	TAMPA ELECTRIC	Stack Conditions	Assumed	Actual	Meter Box ID	15		K Factor	1.068
W.O.#	12281.001.001.0001				Meter Box Y	.9961			
Project ID	TECO	% Moisture	7		Meter Box Del H	2.0355	Leak Checks	Initial	Mid-Point / Final
Mode/Source ID	UNIT 1	Impinger Vol (ml)			Probe ID / Length	9'	Sample Train (ft^3)	.015	.012
Samp. Loc. ID	PGD IN STACK	Silica gel (g)			Probe Material	Boro	Leak Check @ (in Hg)	15	9
Run No.ID	3	CO2, % by Vol	8		Pitot / Thermocouple ID	PP302	Pitot good	yes / no	yes / no / yes / no
Test Method ID	OHM	O2, % by Vol	12		Pitot Coefficient	0.84	Orsat good	yes / no	yes / no / yes / no
Date ID	1NOV1999	Temperature (°F)	348		Nozzle ID	90.196	Temp Check	Pre-Test Set	Post-Test Set
Source/Location	UNIT 1 PGD IN STACK	Meter Temp (°F)	80		Avg Nozzle Dia (in)	0.196	Meter Box Temp	78	74
Sample Date	11/2/99	Static Press (in H_2O)	-1.0	-.85	Area of Stack (ft^2)		Reference Temp	76.7	73.6
Baro. Press (in Hg)	29.53				Sample Time	120	Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Operator	JJP/BP	Ambient Temp (°F)	78		Total Traverse Pts	24	Temp Change Response	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)		COMMENTS
	0	1654			876.364									
2	5		1.4	1.49	879.7	341	77	80	260	260	65	4.0		
3	10		1.2	1.28	882.6	339	80	77	264	260	65	4.0		
4	15		1.3	1.38	885.8	340	80	79	262	261	64	4.0		
5	20		1.4	1.49	889.0	340	80	79	261	260	65	4.0		
6	25		1.3	1.38	892.1	340	80	77	260	260	63	4.0		
	30	1724	1.2	1.28	895.440	338	79	78	260	263	63	4.0		
					19.076	L.C. good @ 8 in Hg								
C 1	0	1740			895.856									
2	5		1.2	1.28	898.9	329	75	76	264	270	68	4.0		
3	10		1.3	1.38	902.0	341	75	75	264	265	59	4.0		
4	15		1.3	1.38	905.2	341	76	74	264	261	58	4.0		
5	20		1.4	1.49	908.4	342	76	74	264	261	59	4.5		
6	25		1.5	1.60	912.0	341	76	73	262	265	59	4.5		
	30	1810	1.3	1.38	915.179	340	76	74	262	266	59	4.5		
					19.323	L.C good @ 8 in Hg								
BP JJP					9+									
B 1 4	0	1832			915.626									
2 3	5		1.4	1.49	918.7	341	72	72	260	268	65	4.5		
3 4	10		1.4	1.49	921.9	341	73	72	264	261	58	5.0		
4 5	15		1.4	1.49	925.1	341	75	72	264	259	57	5.0		
5	20		1.4	1.49	928.3	342	75	72	260	260	55	5.0		
6	25		1.4	1.49	931.2	341	75	72	258	262	57	5.0		
	30	1902	1.4	1.49	934.853	336	75	72	264	265	56	5.0		19.227
			Avg Sqrt Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm 75		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
				Avg Sqrt Del H	Comments:									

See last pg.

Ontario Hydro Method

ISOKINETIC FIELD DATA SHEET — Ontario Hydro Method - Mercury

Client: TAMPA ELECTRIC | Operator: JP/PG
Source: UNIT 1 | Run No.: 3
Sample Loc.: ~~EGD IN~~ STACK | Date: 11/2/99 | K Factor: 1.068

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM INLET TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (In Hg)		COMMENTS
	0	1916			935.211									
2	5		1.3	1.38	938.3	334	72	72	260	260	65	4.0		
3	10		1.4	1.49	941.4	342	73	72	264	267	58	4.0		
4	15		1.4	1.49	944.7	341	74	92	260	259	60	5.0		
5	20		1.4	1.49	948.0	341	75	72	260	259	61	5.0		
6	25		1.4	1.49	951.6	340	72	72	260	265	62	5.0		
	30	1948	1.4	1.49	954.345	340	75	72	260	265	63	5.0		
					19.134									
Avg Sqrt Delta P				Avg Delta H		Total Volume		Avg Ts		Avg Tm		Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
1.1632				1.4408		76.760		340		75		258/264	259/270	68	5	
				Avg Sqrt Del H		Comments:										
				1.1999												

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SAMPLE RECOVERY FIELD DATA

Method ONTARIO HYDRO Method - Mercury

Client TAMPA Electric W.O. # 12281.001.001

Location/Plant Polk Source & Location UNIT 1 STACK

Run No. TECOPK-UNIT 1-STK-1-OHM-1NOV99 Sample Date 11/2/99 Recovery Date 11/2/99

Sample I.D. Analyst OHM Filter Number W-4

	Impinger								
	1	2	3	4	5	6	~~Imp.Total~~ 7	~~7~~ Total CiO	~~Total~~ Sic Gel
Contents									
Final	770.5	610.8	730.9	685.0	617.1	618.2	671.7		316.9
Initial	687.4	591.7	730.2	684.5	616.5	617.9	670.0		300
Gain	83.1	19.1	0.7	0.5	0.6	0.3	1.7	106	16.9

Impinger Color 1-4 Clear Colorless Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Run No. TECOPK-UNIT 1-STK-2-OHM-1NOV99 Sample Date 11/2/99 Recovery Date 11/2/99

Sample I.D. Analyst OHM Filter Number W-5

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final	677.4	716.8	692.9	621.6	703.2 ~~702.8~~	702.4 ~~702.0~~	674.5 ~~674.3~~		318.5
Initial	596.5	701.3	692.8	621.4	~~617.3~~	~~685.2~~	~~621.6~~		300
Gain	80.9	15.3	0.1	0.2	0.4	0.4	0.2	97.5	18.5

Impinger Color 1-4 Clear Colorless Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Run No. TECOPK-UNIT 1-STK-3-OHM-1NOV99 Sample Date 11/2/99 Recovery Date 11/2/99

Sample I.D. Analyst OHM Filter Number W-6

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final	763.7	609.2	725.8	689.3	614.5	627.0	674.9		318.2
Initial	682.7	596.8	724.5	688.2	613.8	626.1	673.5		300
Gain	81.0	12.4	1.3	1.1	0.7	0.9	1.4	98.8	18.2

Impinger Color 1-4 Clear Colorless Labeled? ✓

Silica Gel Condition 1/2 Blue Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON

SAMPLE RECOVERY FIELD DATA

Method ontario Hydro

Client TECO
Location/Plant Polk
W.O. #
Source & Location Field Blank

Run No. POLK-UNIT 1 STK-BT-OHM-1 NOV 1999 Sample Date 11/2/99 Recovery Date 11/2/99
Sample I.D. Analyst OHM Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final	738.4	733.0	729.0	670.2	617.1	685.2	621.8		300.0
Initial	738.4	733.0	729.2	669.8	617.3	685.2	621.6		300.0
Gain									0

Impinger Color 1-4 Clear colorless Labeled? ✓
Silica Gel Condition BLUE Sealed? ✓

Run No. ___ Sample Date ___ Recovery Date ___
Sample I.D. Analyst Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color Labeled?
Silica Gel Condition Sealed?

Run No. ___ Sample Date ___ Recovery Date ___
Sample I.D. Analyst Filter Number

	Impinger								
	1	2	3	4	5	6	Imp.Total	7	Total
Contents									
Final									
Initial									
Gain									

Impinger Color Labeled?
Silica Gel Condition Sealed?

Check COC for Sample IDs of Media Blanks

WESTON MANAGERS DESIGNERS CONSULTANTS

Source Gas Analysis Data Sheet - Method 3

Client TECO

Location/Plant POLK

Source UNIT 1 STACK

W.O. Number _____

Analyst JW

Date 11/2/99

Analytical Method ~~(circle one)~~ O2SHT

Run Number ONE

Leak Check Good? (circle one) (Yes) No

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		8.2	20.6	12.4	
2		8.0	20.1	12.1	
3		8.0	20.2	12.2	
	Average	8.1		12.2	

Run Number TWO

Leak Check Good? (circle one) (Yes) No

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		7.8	19.5	11.7	
2		8.0	19.6	11.6	
3		8.0	19.6	11.6	
	Average	7.9		11.6	

Run Number THREE

Leak Check Good? (circle one) (Yes) No

Analysis Number	Analysis Time	Percent CO_2 (A)	Percent Total (B)	Percent O_2 (B - A)	Percent N_2 (100 - B)
1		8.2	20.0	11.8	
2		8.2	20.2	12.0	
3		8.4	20.4	12.0	
	Average	8.3		11.9	

Acceptable differences for repeat analysis:

if CO_2 > 4% than +/- 0.3%

if CO_2 < or = 4% than +/- 0.2%

if O_2 > or = 15% than +/- 0.2%

if O_2 < 15% than +/- 0.3%

Ambient Check

Oxygen 20.8

Carbon Dioxide 0.0

Report all values to the nearest 0.1 percent

Comments _____

Method3

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APPENDIX D
LABORATORY ANALYTICAL REPORTS

COAL SAMPLE ANALYTICAL REPORT

PHILIP
ANALYTICAL SERVICES

INDUSTRIAL HYGIENE **ENVIRONMENTAL TESTING**

- EPA/NVLAP 101262-0
- AIHA ACCREDITATION NO. 100439
- NY DOH 10903
- PA DER 06-353
- NJ DEP 77678

November 29, 1999

Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Laboratory Project: 187928
Client Reference: Tampa Electric/12281.001.001

Dear Mr. O'Neill:

The samples which were logged in on 09-NOV-99 have been analyzed as requested. The analytical results are enclosed in the attached report.

Please note that any unused portion of the samples will be disposed after 19-DEC-99, unless you have requested otherwise.

Thank you for the opportunity to provide these services to you. If you have any questions concerning this report, please contact a Client Services representative at 610/921-8833.

Sincerely,

Fred Usbeck, CIH
Director, Laboratory Services

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: Roy F. Weston, Inc.

Report to: Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Project: 187928
Received: 09-NOV-99
Reported: 29-NOV-99

PURCHASE ORDER: 0008271

Project Description: Tampa Electric/12281.001.001

Sampled: 02-NOV-99

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
TECO-COAL-RUN 1						
Lab Sample: 1382326						
Moisture, Total	9.99		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.10	0.11	%	E776/300.0	16-NOV-99	DRK
SHORT PROX - COAL						
Ash	11.8	13.1	%	D 3174	16-NOV-99	VJO
Sulfur	2.80	3.11	%	D 4239	12-NOV-99	VJO
Heating Value	10770	11960	BTU/lb	D 3286	18-NOV-99	VJO
TECO-COAL-RUN 2						
Lab Sample: 1382327						
Moisture, Total	10.7		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.09	0.10	%	E776/300.0	16-NOV-99	DRK
SHORT PROX - COAL						
Ash	9.03	10.1	%	D 3174	16-NOV-99	VJO
Sulfur	2.79	3.12	%	D 4239	12-NOV-99	VJO
Heating Value	11550	12930	BTU/lb	D 3286	18-NOV-99	VJO
TECO-COAL-RUN 3						
Lab Sample: 1382328						
Moisture, Total	11.1		%	D 3302	10-NOV-99	GLB
Mercury, Total	< 0.1	< 0.1	mg/kg	7471	18-NOV-99	SMW
Chlorine, Total	0.10	0.11	%	E776/300.0	16-NOV-99	DRK
SHORT PROX - COAL						
Ash	8.60	9.67	%	D 3174	16-NOV-99	VJO

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

Client: Roy F. Weston, Inc.
Project: 187928

	AS RECEIVED BASIS	DRY BASIS	UNITS	METHOD	DATE	ANALYST
TECO-COAL-RUN 3						
Lab Sample: 1382328 - continued						
Sulfur	2.99	3.36	%	D 4239	12-NOV-99	VJO
Heating Value	11520	12970	BTU/lb	D 3286	18-NOV-99	VJO

< Indicates less than the limit of quantitation.

Philip Analytical Services
Quality Assurance Protocol

PAS Sample #: 1382326-1382327,1382328

Client Name: Roy F. Weston

PAS Project #: 187928

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		
1382328-Ash					9.43	9.53	1.1	11.8	12.0	102		0.01
1382251-Sulfur					1.09	1.10	0	1.78	1.80	101		0.01
1372328-Heating Value					12706	12669	0.30	13350	13366	100		50
1372328-Chlorine					0.11	0.11	0	2.00	2.03	102	0.01	0.01

Matrix Spike	75 - 125
Laboratory Control Sample	80 - 120
Duplicate	0 - 20

Philip #	1382326-2328
QC Batch #	1382328

Philip Report #	187928
Client Name	Roy F. Weston

	MATRIX SPIKE(mg/kg)				SAMPLE DUPLICATE(mg/kg)			METHOD	LABORATORY CONTROL SAMPLE(mg/L)		
Parameter	Sample Conc	Spike Conc	Matrix Conc	Spike Recovery %	Sample Conc	Duplicate Conc	Precision RPD %	BLANK mg/L	Spike Conc	Found Conc	Recovery %
Mercury	< 0.10	0.952	0.986	104	< 0.10	< 0.10	0	< 0.0002	0.0020	0.00209	105

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

187928

WESTON

Page 1 of 1

Client: TAMPA Electric
Est. Final Proj. Sampling Date
Work Order # 13281.001.001
Project Contact/Phone # Bill Oncill
AD Project Manager
QC STD Del TAT STD
Date Rec'd _____ Date Due _____
Account # _____

Refrigerator #															
#/Type Container	Liquid														
	Solid														
Volume	Liquid														
	Solid														
Preservatives															
ANALYSES REQUESTED →		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb				Metal	CN					

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, EP/TCLP - Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	BTU	Sulfur	Ash	Mercury	Chlorine
	TECO-COAL-RUN1				11/2/99		X	X	X	X	X
	TECO-COAL-RUN2				11/2/99		X	X	X	X	X
	TECO-COAL-RUN3				11/2/99		X	X	X	X	X

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
BTU - ASTM D3286
SULFUR - ASTM D4239
ASH - ASTM D3174
MERCURY - ASTM D2013 / EPA 7471

DATE/REVISIONS:
1. Chlorine - ASTM E776 / EPA 300
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	D Barton	11-9-99	1110 AM		[signature]	11/9/99	1330

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ✓
Airbill # _____
2) (Ambient) or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (N/A) Y or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# _____ 381-596a

writer
PN 187928
#1382326

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	7.38	7.38 > 9.99	****
MOISTURE:	%	2.82	2.61	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	78.25	86.93
ASH:	%	12.70	11.76	13.07
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	11626	10770	11960
SULFUR:	%	3.02	2.80	3.11
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.29	-0.32
HYDROGEN INCL WATER:	%	0.00	0.83	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.11	0.10	0.11
OXYGEN EXCL WATER:	%	****	75.64	84.04
OXYGEN INCL WATER:	%	84.17	84.51	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

Wester
PN 187928
1382327

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	8.23	8.23	****
MOISTURE:	%	2.67	2.45	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	80.29	89.89
ASH:	%	9.84	9.03	10.11
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	12581	11550	12930
SULFUR:	%	3.04	2.79	3.12
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.27	-0.31
HYDROGEN INCL WATER:	%	0.00	0.92	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.10	0.09	0.10
OXYGEN EXCL WATER:	%	****	77.68	86.97
OXYGEN INCL WATER:	%	87.02	87.17	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

10.68

SAMPLE ID:		INPUT AIR DRY	AS RECEIVED	DRY BASIS
AIR DRY LOSS:	%	8.77	8.77	****
MOISTURE:	%	2.59	2.36	****
VOLATILE MATTER:	%	0.00	0.00	0.00
FIXED CARBON:	%	****	80.26	90.32
ASH:	%	9.43	8.60	9.68
PROXIMATE TOTAL:	%	****	100.00	100.00
HEATING VALUE:	BTU/LB	12631	11520	12970
SULFUR:	%	3.28	2.99	3.37
CARBON:	%	0.00	0.00	0.00
HYDROGEN EXCL WATER:	%	0.00	-0.26	-0.30
HYDROGEN INCL WATER:	%	0.00	0.98	****
NITROGEN:	%	0.00	0.00	0.00
CHLORINE:	%	0.11	0.10	0.11
OXYGEN EXCL WATER:	%	****	77.44	87.14
OXYGEN INCL WATER:	%	87.18	87.32	****
ULT TOTAL EXCL WATER:	%	****	100.00	100.00
ULT TOTAL INCL WATER:	%	100.00	100.00	****

AIR-DRY MOISTURE LOSS

Date In	Weighed By	Pan #	Pan Wt. (g)	Original Pan & Sample Weight (g)	Original Sample Weight (g)	Date Out	Weighed By	F & S					
11/6/99	GB	I	360.8	658.2		11/8	GB	4					
		H	368.9	742.3				4					
		F	365.6	733.8				5					
		K	368.4	759.9				4					
		C	365.7	678.3				5					
		G	361.3	650.0				5					
		C	365.6	805.2				5					
		L	369.8	686.3				5					
		D	363.3	589.8				5					
		81	314.3	489.5				5					
11/8/99	GB	XL	429.7	677.4	247.7	11/9	GB	650.1	27.3	11.0	Kimberly	1381976	S/G
													S/G
11/10/99	GB	XL	429.7	656.9	227.2	11/11	GB	656.1	0.800	0.35	Weston	1382251	S/G
		1	426.0	737.9	311.9			735.9	2.10	0.64		2252	S/G
		2	429.1	709.7	280.6			707.5	2.2	6.78		2253	S/G
													S/G
11/10/99	GB	D	363.2	515.1	151.9	11/11	GB	507.0	8.1	5.33	Millenium	1382306	S/G
		L	369.7	521.8	152.1			513.5	8.3	5.46		2307	S/G
		C	365.6	543.8	178.2			534.2	9.6	5.39		2308	S/G
													S/G
11/10/99	GB	3	421.5	894.4	472.9	11/11	GB	859.5	34.9	7.38	Weston	1382326	S/G
		4	428.0	1019.5	591.5			970.8	48.7	8.23		2327	S/G
		5	461.7	935.0	473.3			893.5	41.5	8.77		2328	S/G

Maine
PN 187841

Moisture

#1381899

Sample #	Tare wt. of Dish (g)	Wet Wt. Sample + Dish (g)	Dry Wt. Sample + Dish	% Moisture
1381899	360.8	698.2	494.6	60.3
1381900	368.9	742.3	497.9	65.4
1381901	365.6	733.8	511.1	60.4
1381902	368.4	759.9	499.8	66.4
1381903	365.7	678.3	504.5	55.5
1381904	361.3	650	506	49.8
1381905	365.5	805.2	523.7	64.0
1381906	369.8	686.3	511.8	55.1
1381907	363.3	589.8	523.6	29.2
1381908	314.3	489.5	433.6	31.9

13:56 11/12/99
ID CODE A0000099 WT0 252 CAL#2
SULFUR 1.80%
14:00 11/12/99
ID CODE A01381976 WT0 259 CAL#2
Kimberly SULFUR 2.10%
187868 14:03 11/12/99
ID CODE A01382326 WT0 262 CAL#2
Weston 187928 SULFUR 3.02%
14:15 11/12/99
ID CODE A01382326 WT0 303 CAL#2
SULFUR 3.02%
14:19 11/12/99
ID CODE A01382327 WT0 302 CAL#2
187928 SULFUR 3.04%
14:22 11/12/99
ID CODE A01382328 WT0 259 CAL#2
187928 SULFUR 3.26%
14:25 11/12/99
ID CODE A01382251 WT0 257 CAL#2
187904 SULFUR 1.09%
14:28 11/12/99
ID CODE A01382251 WT0 257 CAL#2
187906 SULFUR 1.10%
14:32 11/12/99
ID CODE A01382252 WT0 262 CAL#2
187904 SULFUR 1.04%
14:36 11/12/99
ID CODE A01382253 WT0 297 CAL#2
187904 SULFUR 1.04%
14:40 11/12/99
ID CODE A01381942 WT0 181 CAL#2
ERM SULFUR .71%
187681 14:45 11/12/99
ID CODE A01381944 WT0 173 CAL#2
SULFUR .57%
187681 14:55 11/12/99
ID CODE A01381945 WT0 120 CAL#2
187681 SULFUR 1.50%
SO_3 = 1.50 x 2.5 = 3.75% 15:00 11/12/99
ID CODE A01381946 WT0 140 CAL#2
SO_3 SULFUR 2.11%
SO_3 = 2.11 x 2.5 = 5.28% 15:05 11/12/99
ID CODE A01382306 WT0 136 CAL#1

Date	Lab #	Client	BTU/lbs	BTU/lbs -Sulfur	BTU/~~lbs~~ Gal	Remarks	Op
11/15/99	1382650	PAS	12426				
	~~2651~~					188003	Gin
11/16/99	1382651	PAS	12409				
	2652	"	12128			188003	
	2653	"	< 50			"	
	2655	"	< 50			"	
	2656	"	< 50			"	
	2657	"	< 50				
	2658	"	< 50				
	2659	"	< 50				
	2660	"	< 50				
	2661	"	< 50				
(Dup)	2662	"	< 50	Dup.	Electric went out last date		
	2663	"	< 50				
	2664	"	< 50				
	2665		< 50				
	2666		< 50				
	2667		12352				
	2668		12437				
	2669		14775	Dup 14706			
	2670		12406				
	2671		12411				
	2672		12438				
	2673		14542				
	2674		14588				
Dup.	2675		14493				
	2676		12447				
	2677		14820				
	2678		13263				
	2679		19063				
11/18/99	1382251	Weston	13035				
	1382252	"	12869			187906	RHD
	1382253	"	12766			"	
Dup.	1382253	"	12761			"	
11-18-99	1382288	Katahbin	14021			187906	
	2305	Wheelabrator	19313			187915	
	2306	Millenium	08088		138,050	187920	
	2307	"	08317			187921	
	2308		08134			187921	
	2326	Weston	11695			187921	
	2327	"	12651			187928	
11-18-99	2328	"	12706			187928	
Dup	2328		12669			"	
						"	

Coal/RDF Proximate Analysis

DATE: 11/16/99

Signature: V. O'Neal

CLIENT	Control	Kirkby	Weston					
Laboratory Number	98	1381974	1382326	1382327	1382328	1382328 (Dup)	1382251	1382252
all weights in grams								
% Air-dry Loss		11.0	7.38	8.23	8.77		0.35	0.64
Weight of Crucible and Sample	22.9239	19.4445	22.9196	18.7853	21.2582	20.0799	21.5220	18.1677
Weight of Crucible	21.7901	18.3101	21.9301	17.6890	20.2596	19.3883	20.5378	17.1619
Weight of Sample	1.1338	1.1344	.7895	1.0963	.9986	.6916	.9842	1.0058
Weight of Crucible and Sample	22.9239	19.4445	22.9196	18.7853	21.2582	20.0799	21.5220	18.1677
Weight after 105 deg. C	22.9180	19.4377	22.8917	18.7560	21.2323	20.0616	21.5116	18.1568
Weight loss (moisture)	.0059	.0068	.0279	.0293	.0259	.0183	.0104	.0169
% Residual Moisture	0.52	0.60	2.82	2.67	2.59	2.65	1.06	1.68
Weight of Crucible and Sample	21.1231	21.6399						
Weight of Crucible	20.5721	20.8082						
Weight of Sample	.5510	.8317						
Weight of Crucible and Sample	21.1231	21.6379						
Weight after 950 deg. C for 7 min.	20.9807	21.5796						
Weight loss (Volatiles)	.1424	.0603						
% Volatiles	25.84	7.25						
% Residual Moisture	.52	.60						
% Volatile Matter	25.3	6.65						
Weight after 750 deg. C	21.9256	18.7117	22.0561	17.7969	20.3538	19.4542	20.6365	17.2712
Weight of Crucible	21.7901	18.3101	21.9301	17.6890	20.2596	19.3883	20.5378	17.1619
Weight of Ash	.1355	.4016	.1260	.1079	.0942	~~.0659~~	.0987	.1093
% Ash	12.0	35.4	12.7	9.84	9.43	9.53 .0459	10.0	10.9
% Sulfur		2.10	3.02	3.04	3.28		1.09	1.10
BTU per pound		8893	11695	12651	12706		13035	12869
BTU sulfur correction		48	49	70	75		25	25
BTU per pound, corrected		8845	11646	12581	12631		13010	12844
BTU per pound, Moisture Ash Free								

CHLORINE, BOMBING TITRATION

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mv readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
11/13/99	Control	50 / 0.5043	VO		4.10	mg/L x +50	50 / 0.5043	x .000	1				
						=	2.03% chlorine						
	Blank	50 / 0.5010			0.095	mg/L x	50 / 0.5010	x .000	1				
						=	0.01%						
	ERM 1381343 187681	50 / 0.4549				76.8	mg/L x	50 / 0.4549	x .000	1			
						=	0.84% chlorine						
	ERM 1381344 187681	50 / 0.5011				136	x 50 / 0.5011	x .000	1				
						=	1.35% chlorine						
	Weston 1382329 187928	50 / 0.4644				10.3	mg/L x	50 / 0.4644	x .000	1			
						=	0.11% Cl						

0082

0083

CHLORINE, BOMBING TITRATION

DATE/ TIME	SAMPLE #	SAMPLE WT. (g)	ANALYST	DATE/ TIME	$AgNO_3$ (ml)	mv readings	1st DERIV-ATIVE	2nd DERIV-ATIVE	END POINT (ml)	NORMALITY of $AgNO_3$ and Standardization Reference	BLANK CORRECT	% CHLORINE	ANALYST
11/13/99	weston 1382327 187928	50 / 0.5657	VO			11.8	mg/l x	50 / 0.5657	x .0001				
							=	0.10% Cl					
	1382328 187928	50 / 0.4244				9.92	mg/l x	50 / 0.4244	x .0001				
							=	0.11% Cl					
	1382328 (DUP)	50 / 0.4423				10.24	mg/l x	50 / 0.4423	x .0001				
								= 0.11% Cl					
	1382251 187904	50 / 0.4998			9.35	mg/l x	50 / 0.4998	x .0001					
						=	0.09% Cl						
	1382252 187904	50 / 0.4486			8.51	mg/l x	50 / 0.4486	x .0001					
							= 0.09% Cl						

188022
188034
187962
187906-01
187928-01

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/18/99	Element: HG
Analyst: SMW	Time of Analysis: 11:04
Data Validated by: DK 11/18/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-28-23-25, 29-1-3	11/17/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-29-5	11/17/99
IPC/CCV	360-29-4	〃

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Susan M. Wiederkehr 11/18/99

Signature of Analyst and Date

Sample Preparation Log

Date / Time	Project #	Sample #	Prep Method	Initial Wt. / Vol.	Units	Final Volume	Units	Sample Type	Remarks (QA\QC)	Initials
11/17/99	188033	1382871	6009	1	tube	50	ml	[illegible]		smw
		2872								
11/17/99 1410	*	LRB#1 DW	245.1	100	ml	100	ml			smw
		LFB#1 DW								
	188022	1382789						DW		
		2789 Dup								
		2789 MS								
		2789 MSD								
		LRB#2 WW								
		LFB#2 WW								
	188034	1382837						WW		
		2838								
		2838 Dup								
		2838 MS								
		2838 MSD								
		LRB#3 TCLP	7470							
		LFB#3 TCLP								
	187962	1382502		20				TCLP		
		2503								
		2504								
		2504 Ext Dup								
		2504 MS								
		2504 MSD								
		LRB#4 Soil	7471	100						
		LFB#4 Soil								
	187906	1382251		0.23	g			CO		
		2252		0.21						
		2253		0.20						
	187928	2326		0.21						
		2327		0.21						
		2328		0.20						

Comments : Samples prepped 11/17/99 1410 were placed in a 95°C waterbath at 15:30 and removed at 17:30. LFB's, MS, & MSD's were fortified w/ 200ml working ily stock soln.

Sample Preparation Log

Date / Time	Project #	Sample #	Prep Method	Initial Wt. / Vol.	Units	Final Volume	Units	Sample Type	Remarks (QA\QC)	Ini
11/17/11	187928	1382328-01	7471	0.24	g	100	ml	CO		Sm
↓	↓	2328-MS	↓	0.21	↓	↓	↓	↓		↓
↓	↓	2328-MSD	↓	0.21	↓	↓	↓	↓		↓
↓	*	0.20 MB LCS/LCSD	245.1	100	ml	↓	↓		20 [illegible]	↓

Comments :

Reagents, QC, Standards Preparation Log #360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents #	Vol/Wt of Reagents Units	Reagent SSM ID #	Reagent SSM ID # Conc.	Final Volume #	Final Volume Units	Dilution Matrix	Remarks
1) 11/10/99	JP		Cal Blk	—	—	—	—	100	ml		
2)			0.50 ug/l Hg Std	50	ul	360-27-24	1.00 mg/l Hg				
3)			1.00	100							
4)			2.00	200							
5)			5.00	500							
6)			10.0	1000							
7)			IPC/CCV 5.0 ug/l	500							
8)			QCS/ICV 5.0 ug/l	500		360-27-25					
9) 11/12/99 1150	JP		1.00 mg/l Hg Stock Std.	100	ul	Hg-9951185019	1000 mg/l	100	ml	0.15% HNO_3	
10)			1.00 mg/l Hg QCS stock	100	ul	Hg-995123001					
11)			Cal Blk	—	—	—	—	50	ml	2.5 ml HNO_3 + 2.5 ml HCl	NIOSH 6009
12)			0.20 ug/l Hg std	10	ul	360-28-9	1.00 mg/l Hg				
13)			0.50	25							
14)			1.00	50							
15)			2.00	100							
16)			5.00	250							
17)			ICV/QCS 3.0 ug/l	150		360-28-10					
18)			IPC/CCV 2.0 ug/l	100		360-28-9					
19)			1.00 mg/l IPC-Hg chk. WW	500	ul	9951375001	200 mg/l Hg	100	ml	0.15% HNO_3	
20)			2.00 ug/l IPC-Hg chk WW	200	ul	360-28-19	1.00 mg/l Hg	100	ml	5.0 ml HNO_3 + 5.0 ml HCl	
21) 11/17/99	SMW		1.00 mg/l Hg Stock	100	ul	Hg-9951185019	1000 mg/l	~~50~~ 100	ml	0.15% HNO_3	
22)			1.00 mg/l Hg Stock QCS			Hg-995123001		100	ml		
23)			Cal Blk	—	—	—	—	50	ml	2.5% HNO_3 + 2.5% HCl	NIOSH 6009
24)			0.20 ug/l Std	10	ul	360-28-21	1.00 mg/l	50	ml		
			0.50	25							

Reagents, QC, Standards Preparation Log #360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents #	Vol/Wt of Reagents Units	Reagent SSM ID #	Conc.	Final Volume #	Final Volume Units	Dilution Matrix	Remarks
1) 11/17/99	SMW		1.00 mg/L Std	50	ml	360-28-21	1.00 mg/L	50	ml	2.5 mL HNO3 + 2.5 mL HCl	NIOSH 6009
2)			2.00	100							
3)			5.00	250							
4)			IPC/CCV 2.0 mg/L	100							
5)			ICV/QCS 3.0 mg/L	150		360-28-22					
6)											
7)											
8)											
9)											
10)											
11)											
12)											
13)											
14)											
15)											
16)											
17)											
18)											
19)											
20)											
21)											
22)											
23)											
24)											
25)											

```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:23:01 18 Nov 1999 Xmit: Off  Gas:          LPM
  Idle                                                User:              A/S: On
```

INSTRUMENT: Scheduled Maintenance

		Uses left	Last service	Next service
replace:	Pump tubing	565	17-Nov-99	27-Nov-99
	Waste drain tubing	2236	12-Nov-99	27-Oct-00
	Liquid/gas separator	1447	07-Sep-99	11-Oct-00
	pump head	10000	N/A	N/A
	Hg lamp	N/A	30-Aug-99	27-Jan-00
	Reductant bottle	228	15-Nov-99	13-May-00
	process tubing	1447	N/A	N/A
Clean optical cell		600	N/A	N/A

* - needs maintenance

```
For help on <hotkey> press Shift <hotkey>
```

```
RunProt: ENVIRON
RunFold: 111899MG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:43:30 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                              User:             A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1

Cup	ID	Extended id	Weight	Volume	Macro
1	DCS	11/17 5.00UG/L	1.0000	1.0000	
2	0.20 UG/L	REPORTING LIMIT	1.0000	1.0000	
3	LRB#1 DW	11/17 245.1	1.0000	1.0000	
4	LFB#1 DW	11/17 2.00UG/L	1.0000	1.0000	
5	1382769		1.0000	1.0000	
6	1382789	DUP	1.0000	1.0000	
7	1382789	MS 2.00UG/L	1.0000	1.0000	
8	1382789	MSD 2.00UG/L	1.0000	1.0000	
9	LRB#2 WW	11/17 245.1	1.0000	1.0000	
10	LFB#2 WW	11/17 2.00UG/L	1.0000	1.0000	
11	1382837		1.0000	1.0000	
12	1382838		1.0000	1.0000	
13	1382838	DUP	1.0000	1.0000	
14	1382838	MS 2.00UG/L	1.0000	1.0000	
15	1382838	MSD 2.00UG/L	1.0000	1.0000	

PgDn

```
Cup 7  ID: 1382789                          Cell entry down Ins to switch
```

```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:46:06 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                              User:             A/S: On
```

PgUp

AUTOSAMPLER: Rack entry Rack RACK#1

Cup	ID	Extended id	Weight	Volume	Macro
16	LRB#3 TCLP	11/17 7470	1.0000	1.0000	
17	LFB#3 TCLP	11/17 2.00UG/L	1.0000	1.0000	
18	1382502	20/100 TCLP	1.0000	1.0000	
19	1382503	20/100 TCLP	1.0000	1.0000	
20	1382504	20/100 TCLP	1.0000	1.0000	
21	1382504	DUP 20/100 TCLP	1.0000	1.0000	
22	1382504	MS 20/100 TCLP	1.0000	1.0000	
23	1382504	MSD 20/100 TCLP	1.0000	1.0000	
24	LRB#4 SOIL	11/17 7471	1.0000	1.0000	
25	LFB#4 SOIL	11/17 2.00UG/L	1.0000	1.0000	
26	1382251	0.23/100	1.0000	1.0000	
27	1382252	0.21/100	1.0000	1.0000	
28	1382253	0.20/100	1.0000	1.0000	
29	1382324	0.21/100	1.0000	1.0000	
30	1382327	0.21/100	1.0000	1.0000	

PgDn

```
Cup 16 extended ID: 11/17 7470                  Call entry down Ins to switch
```

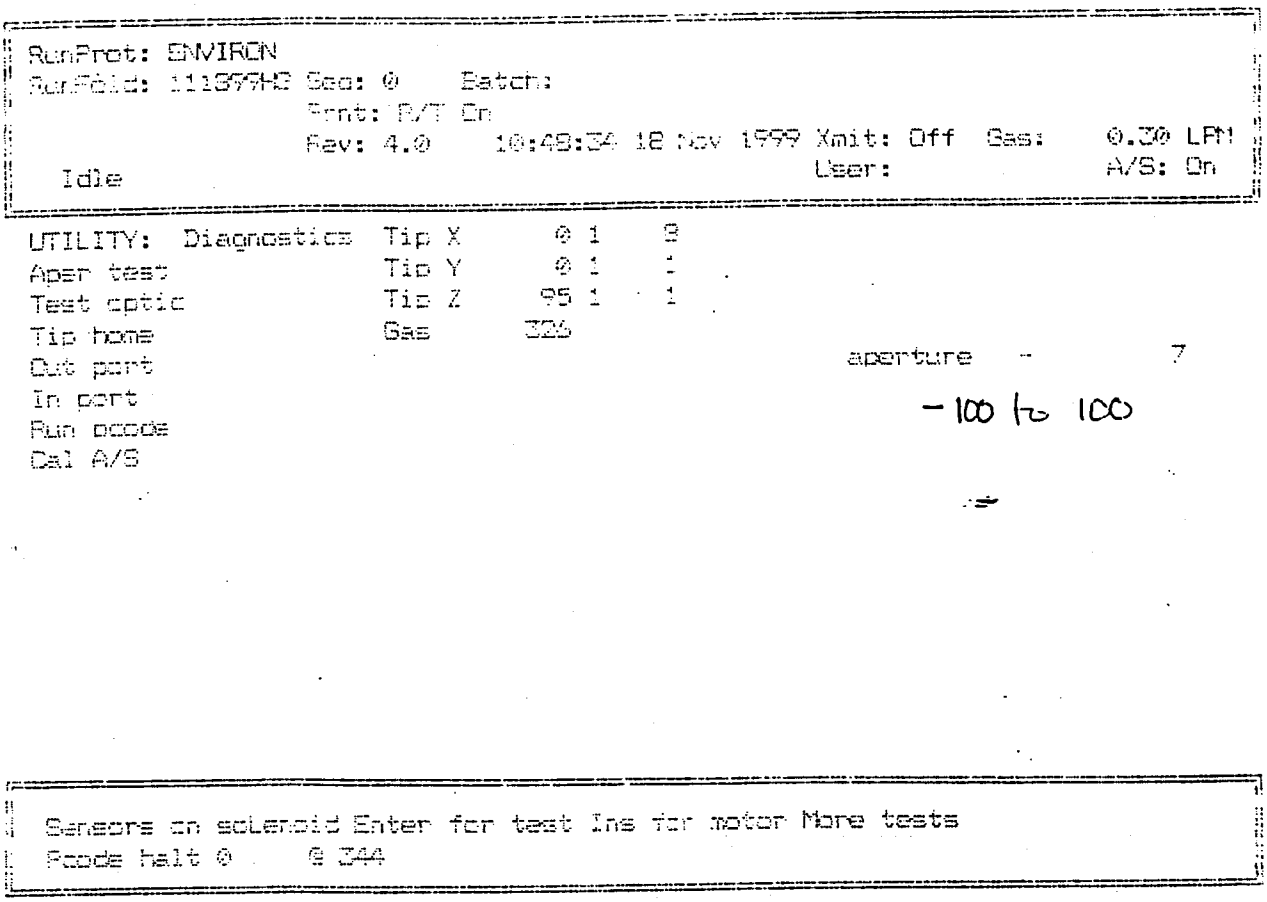
RunProt: ENVIRON
RunFold: 111899HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 10:47:06 15 Nov 1999 Xmit: Off Gas: 0.20 LPM
Idle User: A/S: On

AUTOSAMPLER: Rack entry Rack RACK#1 PgUp

Cup	ID	Extended id	Weight	Volume	Macro
31	1362323	0.20/100	1.0000	1.0000	
32	1362323	DUP 0.24/100	1.0000	1.0000	
33	1362323	MS 0.21/100	1.0000	1.0000	
34	1362323	MSD 0.21/100	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 44 extended ID: Call entry down Ins to switch


RunProt: ENVIRON
RunFold: 111399H2 Seq: 0 Batch:
Prnt: P/T On
Rev: 4.0 10:48:34 12 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle
User: A/S: On
UTILITY: Diagnostics
Aper test
Test optic
Tip home
Out port
In port
Run pcode
Cal A/S
Tip X @ 1 9
Tip Y @ 1 1
Tip Z 95 1 1
Gas 326
aperture - 7
-100 to 100
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0 @ 344

```
RunProt: ENVIRON
RunFold: 111899HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    10:48:42 18 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1    8
Aper test              Tip Y      0 1    1
Test optic             Tip Z     95 1    1
Tip home               Gas      326
Out port                                      Smpl. intensity    1222180
In port                                       Ref. intensity     1227751
Run pcode
Cal A/S
```

$\left.\begin{matrix}\text{Smpl. intensity} & 1222180 \\ \text{Ref. intensity} & 1227751\end{matrix}\right\} \pm 10\%$

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0     @ 142
```

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 1 Rep: 1				Seq: 0		10:54:20 18 Nov 1999 HG		
Hg	.000	ug/l	5670					
*** Standard: 1 Rep: 2				Seq: 1		10:56:10 18 Nov 1999 HG		
Hg	.000	ug/l	6430					
*** Standard: 1 Rep: 1				Seq: 2		10:59:00 18 Nov 1999 HG		
Hg	.000	ug/l	-2741					
*** Standard: 1 Rep: 2				Seq: 3		11:01:00 18 Nov 1999 HG		
Hg	.000	ug/l	-1259					
*** Standard: 1 Rep: 1				Seq: 4		11:04:46 18 Nov 1999 HG		
Hg	.000	ug/l	2937					
*** Standard: 1 Rep: 2				Seq: 5		11:06:37 18 Nov 1999 HG		
Hg	.000	ug/l	3783					
*** Standard: 2 Rep: 1				Seq: 6		11:08:27 18 Nov 1999 HG		
Hg	.500	ug/l	32714					
*** Standard: 2 Rep: 2				Seq: 7		11:10:31 18 Nov 1999 HG		
Hg	.500	ug/l	39425					
*** Standard: 3 Rep: 1				Seq: 8		11:12:35 18 Nov 1999 HG		
Hg	1.00	ug/l	74630					
*** Standard: 3 Rep: 2				Seq: 9		11:14:42 18 Nov 1999 HG		
Hg	1.00	ug/l	71945					
*** Standard: 4 Rep: 1				Seq: 10		11:16:54 18 Nov 1999 HG		
Hg	2.00	ug/l	150240					
*** Standard: 4 Rep: 2				Seq: 11		11:19:07 18 Nov 1999 HG		
Hg	2.00	ug/l	149120					

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 5 Rep: 1				Seq: 12	11:21:18 18 Nov 1999 HG			
Hg	5.00	ug/l	361776					
*** Standard: 5 Rep: 2				Seq: 13	11:23:42 18 Nov 1999 HG			
Hg	5.00	ug/l	368093					
*** Standard: 6 Rep: 1				Seq: 14	11:26:04 18 Nov 1999 HG			
Hg	10.0	ug/l	717957					
*** Standard: 6 Rep: 2				Seq: 15	11:28:35 18 Nov 1999 HG			
Hg	10.0	ug/l	721474					

RunProt: ENVIRON

RunFold: 111899HG Seq: 16 Batch:

Prnt: R/T On

Rev: 4.0 11:29:03 18 Nov 1999 Xmit: Off Gas: 0.38 LPM

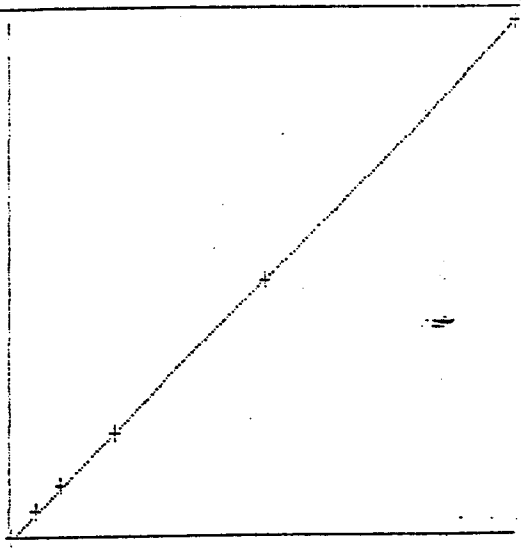
Idle User: A/S: On

CALIBRATION: Line proto: ENVIRON

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.006	-.006	Quadratic
S2	.500	.491	-.009	Wtdlinear
S3	1.00	.968	-.032	C
S4	2.00	2.03	.033	Accept o
S5	5.00	5.03	.034	n
S6	10.0	9.98	-.020	c

A .0000000 r .999974

B 1.39401e-5 C -5.32999e-2



Relative Absorbance

	Mean	%RSD		
S1	3360	17.8	2937	3783
S2	39070	1.29	38714	39426
S3	73287	2.59	74630	71945
S4	149680	0.53	150240	149120
S5	364934	1.22	361776	368093
S6	719715	0.35	717957	721474

New cal coefficients stored

11:31:37 18 Nov 1999 Folder: 111899HG
Protocol: ENVIRON

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

*** Check Standard: 4 CK4IPC/CCV Seq: 16 11:31:37 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		104.	5.22	5.00	ug/l	.000

$\bar{x}$ = 0.00518 mg/L 104% R

*** Check Standard: 3 CK3IPC/CCV Seq: 17 11:33:59 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		103.	5.14	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 18 11:36:22 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-99999	-.060	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/L

*** Check Standard: 1 CK1ICB/CCB Seq: 19 11:38:10 18 NOV 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.041	.200	ug/l	.000

*** Sample ID: QCS Seq: 20 11:39:56 18 Nov 1999 HG

11/17 5.00UG/L

Hg	4.82	ug/l	.000	4.82	

$\bar{x}$ = 0.00482 mg/L 96% R

*** Sample ID: QCS Seq: 21 11:42:13 18 Nov 1999 HG

11/17 5.00UG/L

Hg	4.82	ug/l	.000	4.82	

*** Sample ID: 0.20 UG/L Seq: 22 11:44:31 18 Nov 1999 HG

REPORTING LIMIT

Hg	.146	ug/l	.000	.146	

$\bar{x}$ = 0.0022 mg/L or 0.215 ug/L 108% R

*** Sample ID: 0.20 UG/L Seq: 23 11:46:26 18 Nov 1999 HG

REPORTING LIMIT

Hg	.284	ug/l	.000	.284	

*** Sample ID: LRS#1 DW Seq: 24 11:48:16 18 Nov 1999 HG

11/17 245.1

Hg	-.064	ug/l	.000	-.064	

$\bar{x}$ = <0.0002 mg/L

*** Sample ID: LRS#1 DW Seq: 25 11:50:00 18 Nov 1999 HG

11/17 245.1

Hg	-.058	ug/l	.000	-.058	

*** Sample ID: LFB#1 DW Seq: 26 11:51:45 18 Nov 1999 HG

11/17 2.00UG/L

Hg	1.98	ug/l	.000	1.98	

$\bar{x}$ = 0.00197 mg/L 99% R

*** Sample ID: LFB#1 DW Seq: 27 11:53:53 18 Nov 1999 HG

11/17 2.00UG/L

Hg	1.96	ug/l	.000	1.96	

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 1382789					Seq: 29	11:56:07 18 Nov 1999 HG			
Hg	-.041	ug/l	.000	-.041					$\bar{x}$ = <0.0002 mg/L
*** Sample ID: 1382789					Seq: 29	11:57:51 18 Nov 1999 HG			
Hg	-.046	ug/l	.000	-.046					
*** Sample ID: 1382789					Seq: 30	11:59:33 18 Nov 1999 HG			
			DUP						
Hg	-.044	ug/l	.000	-.044					$\bar{x}$ = <0.0002 mg/L 0% RPD
*** Sample ID: 1382789					Seq: 31	12:01:20 18 Nov 1999 HG			
			DUP						
Hg	-.042	ug/l	.000	-.042					
*** Sample ID: 1382789					Seq: 32	12:03:05 18 Nov 1999 HG			
			MS 2.00UG/L						
Hg	2.14	ug/l	.000	2.14					$\bar{x}$ = 0.00214 mg/L 107% R
*** Sample ID: 1382789					Seq: 33	12:05:19 18 Nov 1999 HG			
			MS 2.00UG/L						
Hg	2.13	ug/l	.000	2.13					
*** Sample ID: 1382789					Seq: 34	12:07:36 18 Nov 1999 HG			
			MSD 2.00UG/L						
Hg	2.11	ug/l	.000	2.11					$\bar{x}$ = 0.00210 mg/L 105% R
*** Sample ID: 1382789					Seq: 35	12:09:45 18 Nov 1999 HG			2% RPD
			MSD 2.00UG/L						
Hg	2.09	ug/l	.000	2.09					
*** Sample ID: LFB#2 WW					Seq: 36	12:11:54 18 Nov 1999 HG			
			11/17 245.1						
Hg	-.058	ug/l	.000	-.058					$\bar{x}$ = <0.0002 mg/L
*** Sample ID: LRB#2 WW					Seq: 37	12:13:40 18 Nov 1999 HG			
			11/17 245.1						
Hg	-.051	ug/l	.000	-.051					
*** Sample ID: LFB#2 WW					Seq: 38	12:15:24 18 Nov 1999 HG			
			11/17 2.00UG/L						
Hg	2.05	ug/l	.000	2.05					$\bar{x}$ = 0.00205 mg/L 102% R
*** Sample ID: LFB#2 WW					Seq: 39	12:17:41 18 Nov 1999 HG			
			11/17 2.00UG/L						
Hg	2.04	ug/l	.000	2.04					

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 40 12:19:51 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09	5.00	ug/l	.000

$\bar{x}$ = 0.00509 mg/L 102% R

*** Check Standard: 3 Ck3IPC/CCV Seq: 41 12:22:14 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.09	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 42 12:24:38 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-54700	-.055	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/L

*** Check Standard: 1 Ck1ICB/CCB Seq: 43 12:26:24 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.047	.200	ug/l	.000

*** Sample ID: 1382837 Seq: 44 12:28:10 18 Nov 1999 HG

Hg	.007	ug/l	.000	.007	

$\bar{x}$ = <0.0002 mg/L

*** Sample ID: 1382837 Seq: 45 12:29:56 18 Nov 1999 HG

Hg	-.001	ug/l	.000	-.001	

*** Sample ID: 1382837 Seq: 46 12:31:41 18 Nov 1999 HG

Hg	-.057	ug/l	.000	-.057	

$\bar{x}$ = <0.0002 mg/L

*** Sample ID: 1382838 Seq: 47 12:33:25 18 Nov 1999 HG

Hg	-.051	ug/l	.000	-.051	

*** Sample ID: 1382838 Seq: 48 12:35:10 18 Nov 1999 HG

DUP

Hg	-.051	ug/l	.000	-.051	*

$\bar{x}$ = <0.0002 mg/L 0% RPD

*** Sample ID: 1382838 Seq: 49 12:36:54 18 Nov 1999 HG

DUP

Hg	-.049	ug/l	.000	-.049	

*** Sample ID: 1382838 Seq: 50 12:38:38 18 Nov 1999 HG

MS 2.00UG/L

Hg	2.06	ug/l	.000	2.06	

$\bar{x}$ = 0.00207 mg/L 104% R

*** Sample ID: 1382838 Seq: 51 12:40:47 18 Nov 1999 HG

MS 2.00UG/L

Hg	2.03	ug/l	.000	2.03	

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

*** Sample ID: 1382833 Seq: 52 12:42:54 18 Nov 1999 HG
MSD 2.00UG/L
Hg 2.04 ug/l .000 2.04

$\bar{x}$ = 0.00204 mg/L 102% R

*** Sample ID: 1382833 Seq: 53 12:45:04 18 Nov 1999 HG 22 RPD
MSD 2.00UG/L
Hg 2.04 ug/l .000 2.04

*** Sample ID: LRB#3 TCLP Seq: 54 12:47:10 18 Nov 1999 HG
11/17 7470
Hg -.064 ug/l .000 -.064

$\bar{x}$ = <0.0002 mg/L

*** Sample ID: LRB#3 TCLP Seq: 55 12:48:54 18 Nov 1999 HG
11/17 7470
Hg -.045 ug/l .000 -.045

*** Sample ID: LFB#3 TCLP Seq: 56 12:50:40 18 Nov 1999 HG
11/17 2.00UG/L
Hg 2.08 ug/l .000 2.08

$\bar{x}$ = 0.00208 mg/L 104% R

*** Sample ID: LFB#3 TCLP Seq: 57 12:52:51 18 Nov 1999 HG
11/17 2.00UG/L
Hg 2.07 ug/l .000 2.07

*** Sample ID: 1382502 Seq: 58 12:55:05 18 Nov 1999 HG
20/100 TCLP
Hg -.037 ug/l .000 -.037

$\bar{x}$ = <0.0002 mg/L (100/20) = <0.00 mg

*** Sample ID: 1382502 Seq: 59 12:56:50 18 Nov 1999 HG
20/100 TCLP
Hg -.034 ug/l .000 -.034

*** Sample ID: 1382502 Seq: 60 12:58:34 18 Nov 1999 HG
20/100 TCLP
Hg -.032 ug/l .000 -.032 *

$\bar{x}$ = <0.001 mg/L

*** Sample ID: 1382503 Seq: 61 13:00:20 18 Nov 1999 HG
20/100 TCLP
Hg -.044 ug/l .000 -.044

*** Sample ID: 1382504 Seq: 62 13:02:04 18 Nov 1999 HG
20/100 TCLP
Hg -.031 ug/l .000 -.031

$\bar{x}$ = <0.001 mg/L

*** Sample ID: 1382504 Seq: 63 13:03:49 18 Nov 1999 HG
20/100 TCLP
Hg -.035 ug/l .000 -.035

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

*** Check Standard: 4 CK4IPC/CCV Seq: 64 13:05:35 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.10	5.00	ug/l	.000

$\bar{x}$ = 0.0050 mg/l 102% R

*** Check Standard: 3 CK3IPC/CCV Seq: 65 13:07:55 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.07	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 66 13:10:16 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-60500	-.061	.0000	ug/l	.000

$\bar{x}$ = <0.0002 mg/l

*** Check Standard: 1 CK1ICB/CCB Seq: 67 13:12:02 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.044	.200	ug/l	.000

*** Sample ID: 1362504 Seq: 68 13:13:48 18 Nov 1999 HG
DUP 20/100 TCLP

Hg	.098	ug/l	.000	.098

$\bar{x}$ = <0.001 mg/l 0% RPD

*** Sample ID: 1362504 Seq: 69 13:15:34 18 Nov 1999 HG
DUP 20/100 TCLP

Hg	.090	ug/l	.000	.090

*** Sample ID: 1362504 Seq: 70 13:17:22 18 Nov 1999 HG
MS 20/100 TCLP

Hg	2.59	ug/l	.000	2.59

T.V. = 0.002 mg/l (100/20) = 0.01 mg/l.

$\bar{x}$ = 0.0025 mg/l 128% R

× (100/20) = 0.028 mg/l

*** Sample ID: 1362504 Seq: 71 13:19:31 18 Nov 1999 HG
MS 20/100 TCLP

Hg	2.52	ug/l	.000	2.52

*** Sample ID: 1362504 Seq: 72 13:21:41 18 Nov 1999 HG
MSD 20/100 TCLP

Hg	2.17	ug/l	.000	2.17

$\bar{x}$ = 0.0021 5 mg/l (100/20) = 0.0108 mg/l

*** Sample ID: 1362504 Seq: 73 13:23:56 18 Nov 1999 HG 108% R
MSD 20/100 TCLP

Hg	2.13	ug/l	.000	2.13

17% RPD

*** Sample ID: LRB#4 SOIL Seq: 74 13:26:04 18 Nov 1999 HG
11/17 7471

Hg	-.034	ug/l	.000	-.034

$\bar{x}$ = <0.0002 mg/l

*** Sample ID: LRB#4 SOIL Seq: 75 13:27:50 18 Nov 1999 HG
11/17 7471

Hg	-.024	ug/l	.000	-.024

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: LFB#4 SOIL					Seq: 76	13:29:35 18 Nov 1999 HG		
					11/17 2.00UG/L			
Hg	2.10	ug/l	.000	2.10				
*** Sample ID: LFB#4 SOIL					Seq: 77	13:31:44 18 Nov 1999 HG		
					11/17 2.00UG/L			
Hg	2.08	ug/l	.000	2.08				
*** Sample ID: 1382251					Seq: 78	13:33:54 18 Nov 1999 HG		
					0.23/100			
Hg	.215	ug/l	.000	.215				
*** Sample ID: 1382251					Seq: 79	13:35:50 18 Nov 1999 HG		
					0.23/100			
Hg	.225	ug/l	.000	.225				
*** Sample ID: 1382252					Seq: 80	13:37:47 18 Nov 1999 HG		
					0.21/100			
Hg	.145	ug/l	.000	.145				
*** Sample ID: 1382252					Seq: 81	13:39:37 18 Nov 1999 HG		
					0.21/100			
Hg	.138	ug/l	.000	.138				
*** Sample ID: 1382253					Seq: 82	13:41:27 18 Nov 1999 HG		
					0.20/100			
Hg	.161	ug/l	.000	.161				
*** Sample ID: 1382253					Seq: 83	13:43:19 18 Nov 1999 HG		
					0.20/100			
Hg	.156	ug/l	.000	.156				
*** Sample ID: 1382326					Seq: 84	13:45:09 18 Nov 1999 HG		
					0.21/100			
Hg	.169	ug/l	.000	.169				
*** Sample ID: 1382326					Seq: 85	13:47:00 18 Nov 1999 HG		
					0.21/100			
Hg	.163	ug/l	.000	.163				
*** Sample ID: 1382327					Seq: 86	13:48:51 18 Nov 1999 HG		
					0.21/100			
Hg	.109	ug/l	.000	.109				
*** Sample ID: 1382327					Seq: 87	13:50:43 18 Nov 1999 HG		
					0.21/100			
Hg	.111	ug/l	.000	.111				

$\bar{x}$ = 0.00209 mg/L 105% R

$\bar{x}$ = 0.00022 mg/L (100/0.23) = <0.10 mg/kg

$\bar{x}$ = <0.10 mg/kg

$\bar{x}$ = <0.10 mg/kg

$\bar{x}$ = <0.10 mg/kg

$\bar{x}$ = <0.10 mg/kg

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

*** Check Standard: 4 CK4ICB/CCV Seq: 88 13:52:31 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.31	5.00	ug/l	.000

$\bar{x}$ = 0.00522 mg/L 104%R

*** Check Standard: 3 CK3ICB/CCV Seq: 89 13:54:41 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.12	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 90 13:56:58 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-59500	-.059	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/L

*** Check Standard: 1 CK1ICB/CCB Seq: 91 13:58:44 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ug/l	.000

*** Sample ID: 1382328 Seq: 92 14:00:30 18 Nov 1999 HG

0.20/100

Hg	.138	ug/l	.000	.138

$\bar{x}$ = <0.10 mg/kg

*** Sample ID: 1382328 Seq: 93 14:02:19 18 Nov 1999 HG

0.20/100

Hg	.133	ug/l	.000	.133

*** Sample ID: 1382328 Seq: 94 14:04:07 18 Nov 1999 HG

DUP 0.24/100

Hg	.179	ug/l	.000	.179

$\bar{x}$ = <0.10 mg/kg 0% RPD

*** Sample ID: 1382328 Seq: 95 14:05:56 18 Nov 1999 HG

DUP 0.24/100

Hg	.166	ug/l	.000	.166

*** Sample ID: 1382328 Seq: 96 14:07:45 18 Nov 1999 HG

MS 0.21/100

Hg	2.07	ug/l	.000	2.07

T.V. = 0.002 mg/L (100/0.219) = 0.952 mg

$\bar{x}$ = 0.00207 mg/L (100/0.21) = 0.986 mg/kg

*** Sample ID: 1382328 Seq: 97 14:09:53 18 Nov 1999 HG 104%R

MS 0.21/100

Hg	2.06	ug/l	.000	2.06

*** Sample ID: 1382329 Seq: 98 14:12:02 18 Nov 1999 HG

MSD 0.21/100

Hg	1.86	ug/l	.000	1.86

$\bar{x}$ = 0.00187 mg/L (100/0.219) = 0.890 mg/kg

*** Sample ID: 1382328 Seq: 99 14:14:04 18 Nov 1999 HG 93%R

MSD 0.21/100

Hg	1.88	ug/l	.000	1.88

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 100 14:16:08 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.29	5.00	ug/l	.000

$\bar{x}$ = 0.00529 mg/l 1062R

*** Check Standard: 3 Ck3IPC/CCV Seq: 101 14:18:17 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.28	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 102 14:20:27 18 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-63400	-.063	.000	ug/l	.000

$\bar{x}$ = <0.0002 mg/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 103 14:22:13 18 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.052	.200	ug/l	.000

187928

PHILIP
ANALYTICAL SERVICES

Client: Roy F. Weston		Test(s): Chloride
Date: 11/16/99	Initials: DK	Reviewed By: CA

Standard 1 Concentration: _____ Reading: _____
Standard 2 Concentration: _____ Reading: _____
Standard 3 Concentration: _____ Reading: _____
Standard 4 Concentration: _____ Reading: _____
Spike 1 Spike Amount: _____ Recv'd _____ Recv'y: _____
Spike 2 Spike Amount: _____ Recv'd _____ Recv'y: _____

Cl2 Cont 1:50 4.10 mg/L

PAGE _____ of _____
☐ Call Results
☐ FAX Results
☐ Results Entered

Sample			Chloride mg/L						
1382326			10.3						
1382327			11.8						
1382328			9.92						
1382328	DUP		10.24						
1382328	MS		19.02						
1382328	MSD		18.79						

Comments For Report:

☐ Analysis performed for PHILIP Analytical by our AIHA accredited reference laboratory ☐ Sample results are blank-corrected

Analytical Method:	LLD
EPA 300.0	1.00 mg/L

N/A = not applicable ND = none detected L/A = sample lost to lab accident QNS = quantity not sufficient to test N/R = sample not received by chemist

Philip Analytical Services

Quality Assurance Protocol

PAS Sample #: 1382328

Client Name: Roy F. Weston

PAS Project #: 187928

Job ID:

Units: mg/L

O1 SUMMARY FORM

Sample Number & Parameter	Sample Conc.	Matrix Spike			Matrix Spike Duplicate			Method Blank	Laboratory Control Sample		
		Spiked Conc.	Matrix Spike Conc.	% Recovery	Matrix Spike Duplicate Conc.	% Recovery	Precision RPD (%)		Spiked Conc.	Found Conc.	% Recovery
CHLORIDE	9.92	10.00	19.02	91	18.79	89	1	0.095	10.00	10.06	101

	Matrix Spike				Duplicate			Laboratory Control Sample			Method Blank	Detection Limits
	Sample Conc.	Spiked Conc.	Matrix Conc.	% Recovery	Sample Conc.	Sample Duplicate Conc.	Precision RPD (%)	Spiked Conc.	Found Conc.	% Recovery		
CHLORIDE	9.92	10.00	19.02	91	9.92	10.24	3	10.00	10.06	101	0.095	1.00

Criteria Limits

Laboratory Control Sample	80 – 120 %
Matrix Spike	75 - 125 %
Duplicate	0 – 20 %

PeakNet AS3500DX - 11169901.AS3

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	WATER	ACIDSCAN	111699	1	1	
50	1	AUTOCAL1	ACIDSCAN	111699	1	1	
50	1	AUTOCAL2	ACIDSCAN	111699	1	1	
50	1	AUTOCAL3	ACIDSCAN	111699	1	1	
50	1	AUTOCAL4	ACIDSCAN	111699	1	1	
50	1	AUTOCLA5	ACIDSCAN	111699	1	1	
50	1	AUTOCAL6	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	QCS	ACIDSCAN	111699	1	1	
50	1	LCS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	1382343 1:20	ACIDSCAN	111699	1	1	
50	1	1381345 1:100	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:100	ACIDSCAN	111699	1	1	
50	1	1382343 1:50	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:1000 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:1000	ACIDSCAN	111699	1	1	
50	1	1380014	ACIDSCAN	111699	1	1	
50	1	1380015	ACIDSCAN	111699	1	1	
50	1	1380015DUP	ACIDSCAN	111699	1	1	
50	1	1380015 MS	ACIDSCAN	111699	1	1	
50	1	1380015 MSD	ACIDSCAN	111699	1	1	
50	1	1380017	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382918 F	ACIDSCAN	111699	1	1	
50	1	1382918 B	ACIDSCAN	111699	1	1	
50	1	1382919 F	ACIDSCAN	111699	1	1	
50	1	1382919 B	ACIDSCAN	111699	1	1	
50	1	1382920 F	ACIDSCAN	111699	1	1	
50	1	1382920 B	ACIDSCAN	111699	1	1	
50	1	1382921 F	ACIDSCAN	111699	1	1	
50	1	1382921 B	ACIDSCAN	111699	1	1	
50	1	1382922 F	ACIDSCAN	111699	1	1	
50	1	1382922 F MS	ACIDSCAN	111699	1	1	
50	1	1382922 B	ACIDSCAN	111699	1	1	
50	1	1382922 B MS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382251	ACIDSCAN	111699	1	1	
50	1	1382252	ACIDSCAN	111699	1	1	
50	1	1382253	ACIDSCAN	111699	1	1	
50	1	1382253 DUP	ACIDSCAN	111699	1	1	
50	1	1382253 MS	ACIDSCAN	111699	1	1	
50	1	1382253 MSD	ACIDSCAN	111699	1	1	
50	1	1382326	ACIDSCAN	111699	1	1	
50	1	1382327	ACIDSCAN	111699	1	1	
50	1	1382328	ACIDSCAN	111699	1	1	
50	1	1382328 DUP	ACIDSCAN	111699	1	1	
50	1	1382328 MS	ACIDSCAN	111699	1	1	

50	1	1381344	ACIDSCAN	111699	1	1	

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	CONTROL 1:50	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	LCS	ACIDSCAN	111699	1	1	
50	1	WATER	STOP	111699	1	1	

More Run Parameters

al s	Oven Ctl	Oven Set	Cool Ctl	Cool Set	Cycle Time	Flush Vol	Visc Factor	Prep Visc	Inj Type	Needle Height
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
8	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
9	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
7	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
1	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
2	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
3	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
4	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
5	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
6	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
[illegible]	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

Ion Chromatography
11/16/99

ERM PROJ # 187681 (WATER SOL EXT) CHLORIDE EPA 300.0

Roy F. Weston Proj # 187380 (SOIL) CHLORIDE EPA 300.0

George Boy Proj # 188058 (AIR) HF, HNO_3, N_2SO_4 NIOSH 7903

CHLORINE (BOMBS)

1382251
1382252
1382253
1382253 DUP
1382253 MS
1382253 MSD

1382326
1382327
1382328
1382328 DUP
1382328 MS
1382328 MSD

1381343
1381344

50	1	1382343 1:20	ACIDSCAN	111699	1	1	
50	1	1381345 1:100	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 DUP	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MS	ACIDSCAN	111699	1	1	
50	1	1381345 1:100 MSD	ACIDSCAN	111699	1	1	
50	1	1381346 1:100	ACIDSCAN	111699	1	1	
50	1	1380014	ACIDSCAN	111699	1	1	
50	1	1380015	ACIDSCAN	111699	1	1	
50	1	1380017	ACIDSCAN	111699	1	1	
50	1	1380017 DUP	ACIDSCAN	111699	1	1	
50	1	1380017 MS	ACIDSCAN	111699	1	1	
50	1	1380017 MSD	ACIDSCAN	111699	1	1	
50	1	1382377	ACIDSCAN	111699	1	1	
50	1	1382378	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382918 F	ACIDSCAN	111699	1	1	
50	1	1382918 B	ACIDSCAN	111699	1	1	
50	1	1382919 F	ACIDSCAN	111699	1	1	
50	1	1382919 B	ACIDSCAN	111699	1	1	
50	1	1382920 F	ACIDSCAN	111699	1	1	
50	1	1382920 B	ACIDSCAN	111699	1	1	
50	1	1382921 F	ACIDSCAN	111699	1	1	
50	1	1382921 B	ACIDSCAN	111699	1	1	
50	1	1382922 F	ACIDSCAN	111699	1	1	
50	1	1382922 F MS	ACIDSCAN	111699	1	1	
50	1	1382922 B	ACIDSCAN	111699	1	1	
50	1	1382922 B MS	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	1382251	ACIDSCAN	111699	1	1	
50	1	1382252	ACIDSCAN	111699	1	1	
50	1	1382253	ACIDSCAN	111699	1	1	
50	1	1382253 DUP	ACIDSCAN	111699	1	1	
50	1	1382253 MS	ACIDSCAN	111699	1	1	
50	1	1382253 MSD	ACIDSCAN	111699	1	1	
50	1	1382326	ACIDSCAN	111699	1	1	
50	1	1382327	ACIDSCAN	111699	1	1	
50	1	1382328	ACIDSCAN	111699	1	1	
50	1	1382328 DUP	ACIDSCAN	111699	1	1	
50	1	1382328 MS	ACIDSCAN	111699	1	1	
50	1	1382328 MSD	ACIDSCAN	111699	1	1	
50	1	1381343	ACIDSCAN	111699	1	1	
50	1	1381344	ACIDSCAN	111699	1	1	
50	1	CONTROL 1:50	ACIDSCAN	111699	1	1	
50	1	METH BLK	ACIDSCAN	111699	1	1	
50	1	IPC	ACIDSCAN	111699	1	1	
50	1	LCS	ACIDSCAN	111699	1	1	

Inj. Vol.	Inj/ Vial	Sample	Method (.MET)	Data	Dil.	Int. Std.	Template (.PRP)
50	1	WATER	STOP	111699	1	1	

More Run Parameters

Oven Ctl	Oven Set	Cool Ctl	Cool Set	Cycle Time	Flush Vol	Visc Factor	Prep Visc	Inj Type	Needle Height
ff	18	Off	0	0.00	400	Normal	Normal	Push	2.0
ff	18	Off	0	0.00	400	Normal	Normal	Push	2.0
ff	18	Off	0	0.00	400	Normal	Normal	Push	2.0
ff	18	Off	0	0.00	400	Normal	Normal	Push	2.0
ff	18	Off	0	0.00	400	Normal	Normal	Push	2.0

306	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
301	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
302	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
303	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
304	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
301	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
306	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
307	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
308	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
309	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
310	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
311	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
312	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
313	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
314	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
315	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
316	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
317	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
318	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
319	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
301	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
302	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
320	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
321	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
322	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
323	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
324	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
325	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
326	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
327	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
328	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
329	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
330	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
331	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
301	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
302	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
301	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
302	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
303	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
304	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
305	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
306	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

307	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
308	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
309	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
310	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
311	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
312	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
313	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
314	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
315	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
01	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
02	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
04	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0
0	Off	18	Off	0	0.00	400	Normal	Normal	Push	2.0

ment:

File	: C:\PEAKNET\DATA\11169001.DXD	Report Date	: 11/16/99 12:29:46 PM
e Name	: WATER - C40	Collected	: 11/16/99 12:17:38 PM
t #	: 1	Vial #	: C40
d File	: c:\peaknet\method\acidscan.met	Calibrated	: 11/16/99 11:03:02 AM
m Name	: ANIONS	Detector	: CD20
n Type	:	Operator	: DK
Points	: 3600	Rate	: 5.00 Hz
e Name	: S/N 96020568 ID:24 Of 15	Moduleware	: 1.17

ion	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
	50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
0.00	FLUORIDE	0.000	0	0	0	0.00
3.05	CHLORIDE	0.199	1281	10014	1	1.67
0.00	NITRITE	0.000	0	0	0	0.00
0.00	BROMIDE	0.000	0	0	0	0.00
0.00	NITRATE	0.000	0	0	0	0.00
0.00	PHOSPHATE	0.000	0	0	0	0.00
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2340	31046		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.05	CHLORIDE	0.199	1281	10014	1	1.67
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2340	31046		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
IDE	2.10	0
E	3.62	0
E	4.57	0
E	5.35	0
ATE	7.22	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

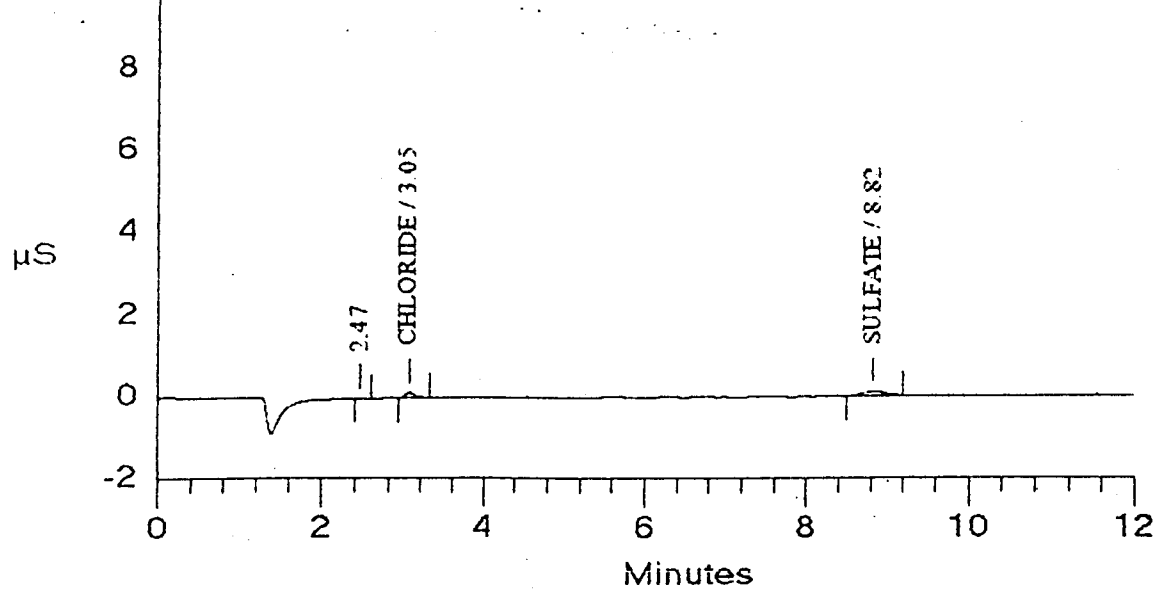
e: \peaknet\schedule\11169901.sch
e 4.30 Page 1 of 2 11/16/99 12:29:46 PM

2.47		0.000	68	614	1	
3.05	CHLORIDE	0.199	1281	10014	1	1.67
8.82	SULFATE	0.132	1059	21032	1	1.15
	Totals	0.331	2408	31659		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.47		0.000	68	614	1	
	Totals	0.000	68	614		

File: 11169001.DXD Sample WATER - C40



AUTOMATIC CALIBRATION UPDATE

File :	C:\PEAKNET\DATA\11169002.DXD	Report Date:	11/16/99 12:43:22 PM
e Name:	AUTOCAL1R - A01	Collected :	11/16/99 12:31:14 PM
t # :	2	Vial # :	A01
d File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 11:03:02 AM
m Name:	ANIONS	Detector :	CD20
Level :	1	Analyst :	

COMPONENTS FOUND IN THIS RUN

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]	2.10	2.10	2.10	1.251e+005	1.214e+005	1.214e+005
[illegible]	3.00	3.03	3.03	1.060e+005	1.077e+005	1.077e+005
[illegible]	8.60	8.68	8.68	6.279e+004	6.336e+004	6.336e+004

TRATE	5.33	5.37	5.37	5.089e+004	5.030e+004	5.030e+004
HOSPHATE	7.22	7.25	7.25	3.125e+004	2.097e+004	2.097e+004
ULFATE	8.72	8.80	8.80	9.171e+004	8.010e+004	8.010e+004

File : C:\PEAKNET\DATA\11169002.DXD		Report Date:	11/16/99 12:43:22 PM
le Name: AUTOCAL1R - A01		Collected :	11/16/99 12:31:14 PM
ct. # : 2		Vial # :	A01
od File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 12:43:22 PM
em Name: ANIONS		Detector :	CD20
mn Type:		Operator :	DK
Points: 3600		Rate :	5.00 Hz
le Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
4.70	BROMIDE	1.000	3267	41387	1	2.92
5.57	NITRATE	1.000	3938	56497	1	4.05
7.25	PHOSPHATE	1.000	1178	20970	1	0.46
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

ule: \peaknet\schedule\11169901.sch
se 4.30 Page 1 of 2 11/16/99 12:43:22 PM

2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
4.70	BROMIDE	1.000	3267	41387	1	2.92
5.57	NITRATE	1.000	3938	56497	1	4.05
7.25	PHOSPHATE	1.000	1178	20970	1	0.46
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Peak Report: All Peaks **********

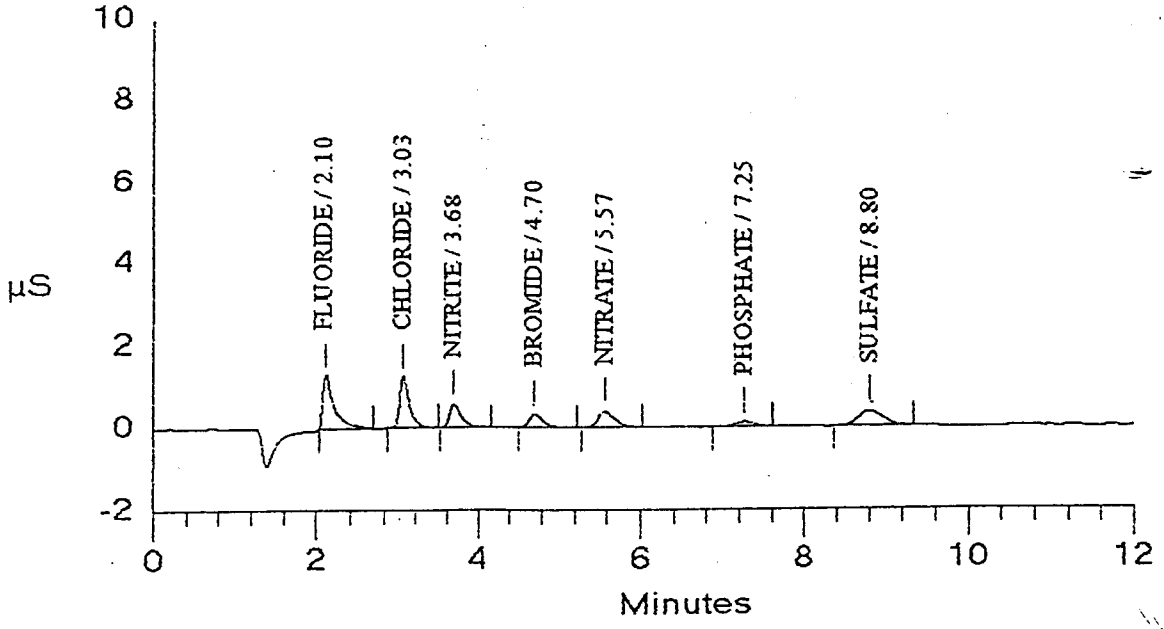
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	1.000	12354	121386	1	0.00
3.03	CHLORIDE	1.000	12274	107712	2	1.11
3.68	NITRITE	1.000	5779	63361	2	1.84
4.70	BROMIDE	1.000	3267	41387	1	2.92

7.25	PHOSPHATE	1.000	1178	20970	1	0.46
8.80	SULFATE	1.000	3717	80102	1	0.96
	Totals	7.000	42508	491415		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169002.DXD Sample AUTOCAL1R - A01



ule: \peaknet\schedule\11169901.sch
se 4.30 Page 2 of 2 11/16/99 12:43:22 PM

********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169003.DXD	Report Date:	11/16/99 12:56:59 PM
le Name:	AUTOCAL2R - A02	Collected :	11/16/99 12:44:51 PM
ct # :	3	Vial # :	A02
od File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 12:43:22 PM
em Name:	ANIONS	Detector :	CD20
Level :	2	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]IDE	2.10	2.10	2.10	2.517e+005	2.542e+005	2.542e+005
[illegible]RIDE	3.03	3.03	3.03	2.084e+005	2.119e+005	2.119e+005
[illegible]ITE	3.68	3.67	3.67	1.300e+005	1.333e+005	1.333e+005
[illegible]MIDE	4.70	4.68	4.68	8.909e+004	9.174e+004	9.174e+004

LFATE	8.60	8.78	8.78	1.659e+005	1.577e+005	1.577e+005

File :	C:\PEAKNET\DATA\11169003.DXD	Report Date:	11/16/99 12:56:59 PM
le Name:	AUTOCAL2R - A02	Collected :	11/16/99 12:44:51 PM
ct # :	3	Vial # :	A02
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 12:56:59 PM
em Name:	ANIONS	Detector :	CD20
mn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91738	2	-0.35
5.53	NITRATE	2.000	7965	117097	2	-0.60
7.27	PHOSPHATE	2.000	2812	53732	1	0.23
8.78	SULFATE	2.000	7271	157686	1	-0.19
	Totals	14.000	91281	1019601		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

ule: \peaknet\schedule\11169901.sch
se 4.30 Page 1 of 2 11/16/99 12:56:59 PM

2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91736	2	-0.35
5.53	NITRATE	2.000	7965	117097	2	-0.60
7.27	PHOSPHATE	2.000	2812	53732	1	0.23
8.78	SULFATE	2.000	7271	157686	1	-0.19
	Totals	14.000	91281	1019601		

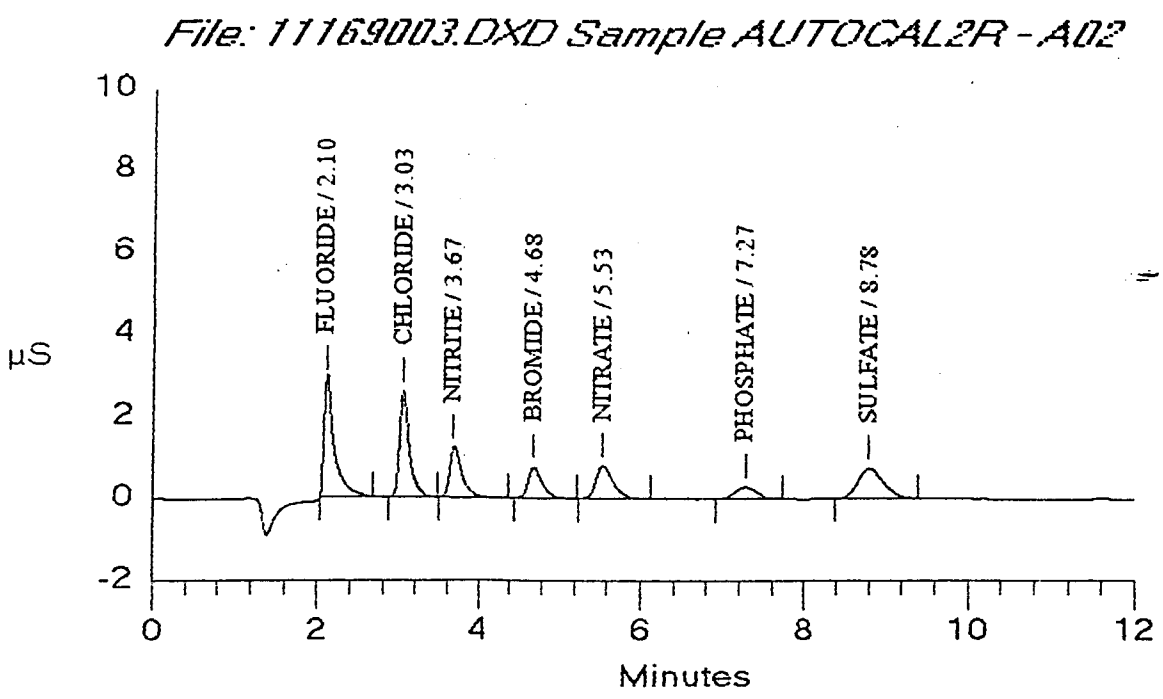
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	2.000	28469	254239	1	0.00
3.03	CHLORIDE	2.000	25433	211852	2	0.00
3.67	NITRITE	2.000	11947	133257	2	-0.45
4.68	BROMIDE	2.000	7382	91738	2	-0.35
	NITRATE	2.000	7965	117097	2	-0.60

8.78	SULFATE	2.000	7271	157686	1	-0.19
	Totals	14.000	91281	1019601		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		



********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169004.DXD	Report Date:	11/16/99 1:10:35 PM
e Name:	AUTOCAL3R - A03	Collected :	11/16/99 12:58:28 PM
t # :	4	Vial # :	A03-
d File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 12:56:59 PM
m Name:	ANIONS	Detector :	CD20
Level :	3	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]	2.10	2.10	2.10	7.292e+005	7.351e+005	7.351e+005
[illegible]	3.03	3.03	3.03	5.487e+005	5.564e+005	5.564e+005
[illegible]	3.67	3.67	3.67	3.363e+005	3.428e+005	3.428e+005
[illegible]	4.68	4.67	4.67	2.300e+005	2.328e+005	2.328e+005
[illegible]	5.53	5.50	5.50	2.960e+005	3.015e+005	3.015e+005

File :	C:\PEAKNET\DATA\11169004.DXD	Report Date:	11/16/99 1:10:35 PM
Name:	AUTOCAL3R - A03	Collected :	11/16/99 12:58:26 PM
# :	4	Vial # :	A03
File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:10:35 PM
Name:	ANIONS	Detector :	CD20
Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301488	1	-0.60
7.27	PHOSPHATE	5.000	7400	144517	1	0.00
8.78	SULFATE	5.000	18447	410429	1	0.00
	Totals	35.000	257970	2723509		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301488	1	-0.60
7.27	PHOSPHATE	5.000	7400	144517	1	0.00
8.78	SULFATE	5.000	18447	410429	1	0.00
	Totals	35.000	257970	2723509		

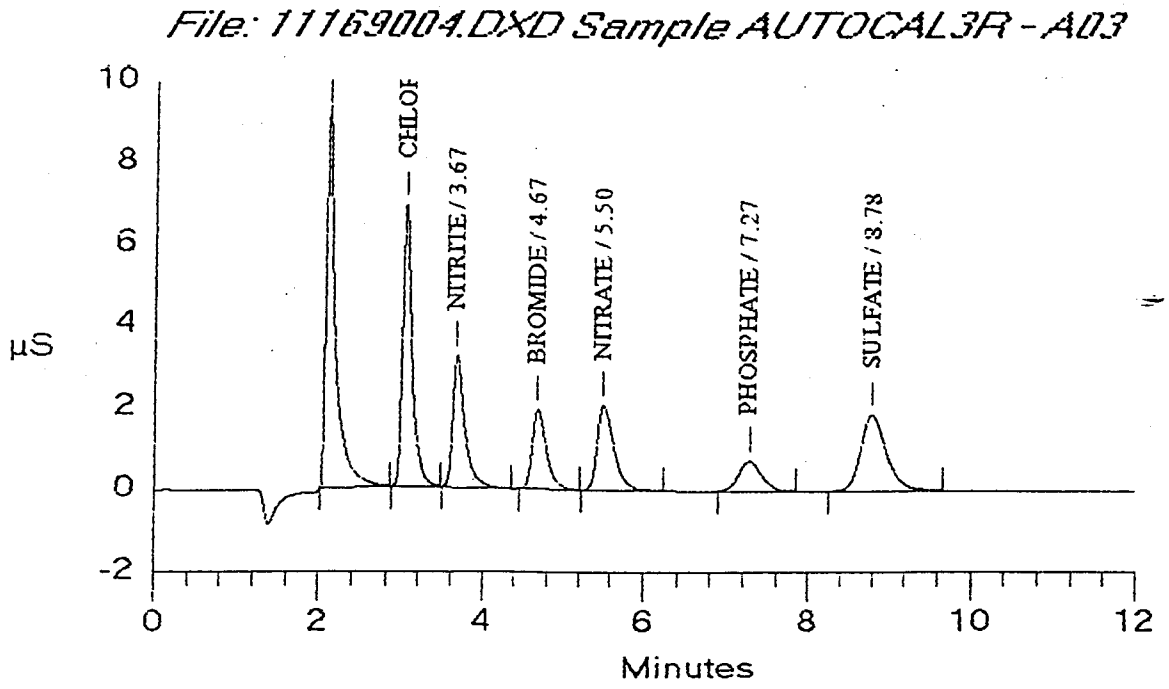
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	5.000	91459	735111	1	0.00
3.03	CHLORIDE	5.000	68808	556394	2	0.00
3.67	NITRITE	5.000	32027	342797	2	0.00
4.67	BROMIDE	5.000	19231	232773	1	-0.36
5.50	NITRATE	5.000	20598	301488	1	-0.60

Totals	35.000	257970	2723509

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		



le: \peaknet\schedule\11169901.sch
e 4.30 Page 2 of 2 11/16/99 1:10:35 PM

********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169005.DXD	Report Date:	11/16/99 1:24:11 PM
e Name:	AUTOCAL4R - A04	Collected :	11/16/99 1:12:04 PM
t # :	5	Vial # :	A04
d File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 1:10:35 PM
m Name:	ANIONS	Detector :	CD20
Level :	4	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
[illegible]RIDE	2.10	2.08	2.08	1.586e+006	1.593e+006	1.593e+006
[illegible]RITE	3.03	3.00	3.00	1.179e+006	1.197e+006	1.197e+006
[illegible]RITE	3.67	3.62	3.62	6.927e+005	7.044e+005	7.044e+005
[illegible]MIDE	4.67	4.62	4.62	4.749e+005	4.847e+005	4.847e+005
[illegible]ATE	5.50	5.42	5.42	6.165e+005	6.251e+005	6.251e+005
[illegible]HATE	7.27	7.22	7.22	2.958e+005	3.013e+005	3.013e+005

File : C:\PEAKNET\DATA\11169005.DXD Report Date: 11/16/99 1:24:11 PM
le Name: AUTOCAL4R - A04 Collected : 11/16/99 1:12:04 PM
t. # : 5 Vial # : A04
od File: c:\peaknet\method\acidscan.met Calibrated : 11/16/99 1:24:11 PM
m Name: ANIONS Detector : CD20
n Type: Operator : DK
Points: 3600 Rate : 5.00 Hz
le Name: S/N 96020568 ID:24 Of 15 Moduleware : 1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76
	Totals	70.000	565244	5738034		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76
	Totals	70.000	565244	5738034		

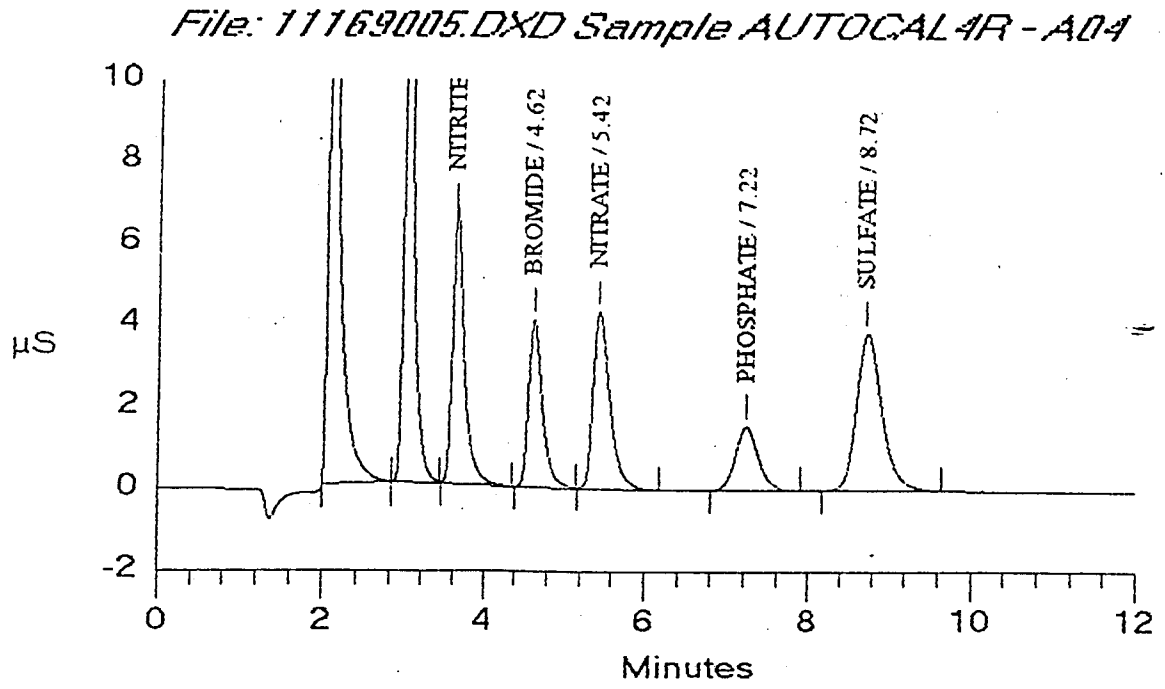
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	10.000	210419	1593389	1	-0.79
3.00	CHLORIDE	10.000	152554	1196708	2	-1.10
3.62	NITRITE	10.000	65171	704372	2	-1.36
4.62	BROMIDE	10.000	40770	484684	2	-1.07
5.42	NITRATE	10.000	42878	625143	2	-1.52
7.22	PHOSPHATE	10.000	15314	301291	1	-0.69
8.72	SULFATE	10.000	38138	832447	1	-0.76

Totals	70.000	565244	5738034

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		



File :	C:\PEAKNET\DATA\11169006.DXD	Report Date:	11/16/99 1:37:47 PM
le Name:	AUTOCLA5 - A05	Collected :	11/16/99 1:25:39 PM
ct # :	6	Vial # :	A05
od File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:24:11 PM
em Name:	ANIONS	Detector :	CD20
nn Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
le Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

3.05 CHLORIDE	15.287	246416	1889632	2	1.67
3.67 NITRITE	15.183	103314	1075226	2	1.38
4.65 BROMIDE	15.236	62877	738932	2	0.72
5.45 NITRATE	15.109	65154	943728	2	0.62
7.25 PHOSPHATE	15.172	23774	466157	1	0.46
8.77 SULFATE	14.982	58468	1254331	1	0.57
Totals	106.286	875693	8873128		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	15.316	315690	2505123	1	1.60
3.05	CHLORIDE	15.287	246416	1889632	2	1.67
3.67	NITRITE	15.183	103314	1075226	2	1.38
4.65	BROMIDE	15.236	62877	738932	2	0.72
5.45	NITRATE	15.109	65154	943728	2	0.62
7.25	PHOSPHATE	15.172	23774	466157	1	0.46
8.77	SULFATE	14.982	58468	1254331	1	0.57
	Totals	106.286	875693	8873128		

********** Peak Report: All Peaks **********

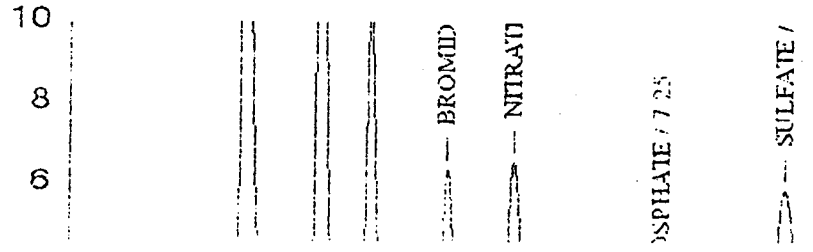
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	15.316	315690	2505123	1	1.60
3.05	CHLORIDE	15.287	246416	1889632	2	1.67
3.67	NITRITE	15.183	103314	1075226	2	1.38
4.65	BROMIDE	15.236	62877	738932	2	0.72
5.45	NITRATE	15.109	65154	943728	2	0.62
7.25	PHOSPHATE	15.172	23774	466157	1	0.46

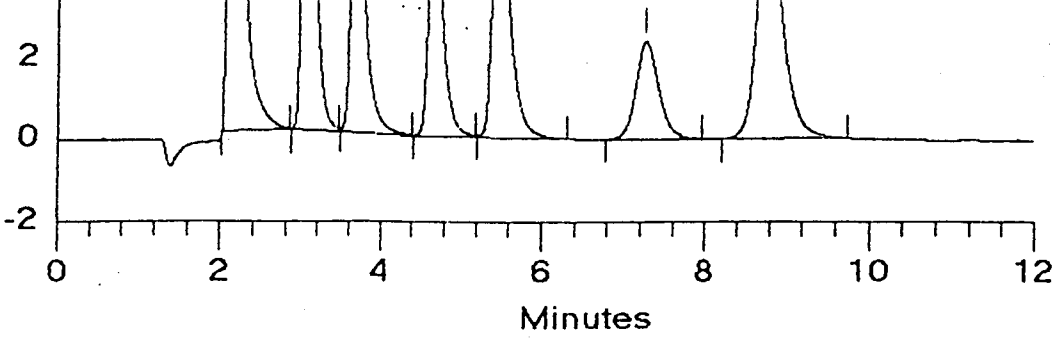
8.77 SULFATE	14.982	58468	1254331	1	0.57
Totals	106.286	875693	8873128		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		

File: 11169006.DXD Sample AUTOCLA5 -A05





********** AUTOMATIC CALIBRATION UPDATE **********

File :	C:\PEAKNET\DATA\11169007.DXD	Report Date:	11/16/99 1:51:23 PM
le Name:	AUTOCAL6R - A06	Collected :	11/16/99 1:39:16 PM
ct # :	7	Vial # :	A06
od File:	c:\peaknet\method\acidscan.met	Last Update:	11/16/99 1:24:11 PM
em Name:	ANIONS	Detector :	CD20
Level :	6	Analyst :	

********** COMPONENTS FOUND IN THIS RUN **********

COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD RESPONSE	MEASURED RESPONSE	NEW RESPONSE
ORIDE	2.08	2.08	2.08	3.376e+006	3.367e+006	3.367e+006
RIDE	3.00	3.00	3.00	2.583e+006	2.591e+006	2.591e+006
ITE	3.62	3.62	3.62	1.441e+006	1.447e+006	1.447e+006
ATE	4.62	4.58	4.58	9.843e+005	9.900e+005	9.900e+005
ATE	5.42	5.37	5.37	1.277e+006	1.289e+006	1.289e+006
PHATE	7.22	7.20	7.20	6.279e+005	6.390e+005	6.390e+005
ATE	8.72	8.70	8.70	1.692e+006	1.692e+006	1.692e+006

ct # : 7 Vial # : A06
od File: c:\peaknet\method\acidscan.met Calibrated : 11/16/99 1:51:23 PM
em Name: ANIONS Detector : CD20
mn Type: Operator : DK
Points: 3600 Rate : 5.00 Hz
le Name: S/N 96020568 ID:24 0f 15 Moduleware : 1.17

ration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
nal	50	1	0.00	12.00	10	10.00	0.94

r type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

ule: \peaknet\schedule\11169901.sch
se 4.30 Page 1 of 2 11/16/99 1:51:23 PM

2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

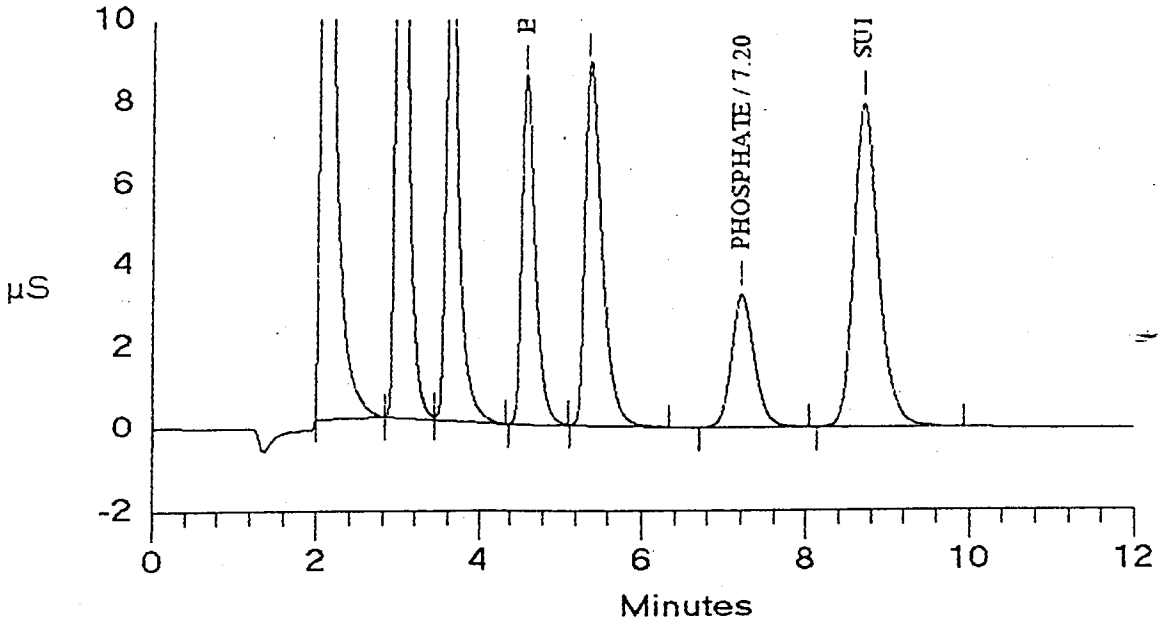
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.08	FLUORIDE	20.000	414825	3367311	1	0.00
3.00	CHLORIDE	20.000	330426	2590837	2	0.00
3.62	NITRITE	20.000	139399	1447210	2	0.00
4.58	BROMIDE	20.000	84796	990015	2	-0.72
5.37	NITRATE	20.000	88227	1289087	2	-0.92
7.20	PHOSPHATE	20.000	32562	639043	2	-0.23
8.70	SULFATE	20.000	79259	1691749	2	-0.19
	Totals	140.000	1169494	12015251		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
Totals		0.000	0	0		

File: 11169007.DXD Sample AUTOCAL6R - A06



Component: FLUORIDE; Fit Type: Quadratic

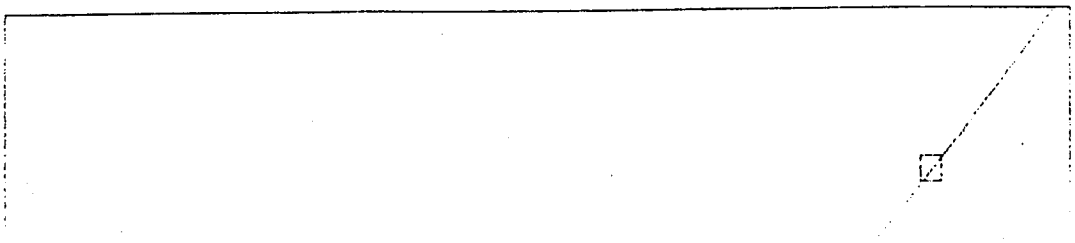
Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

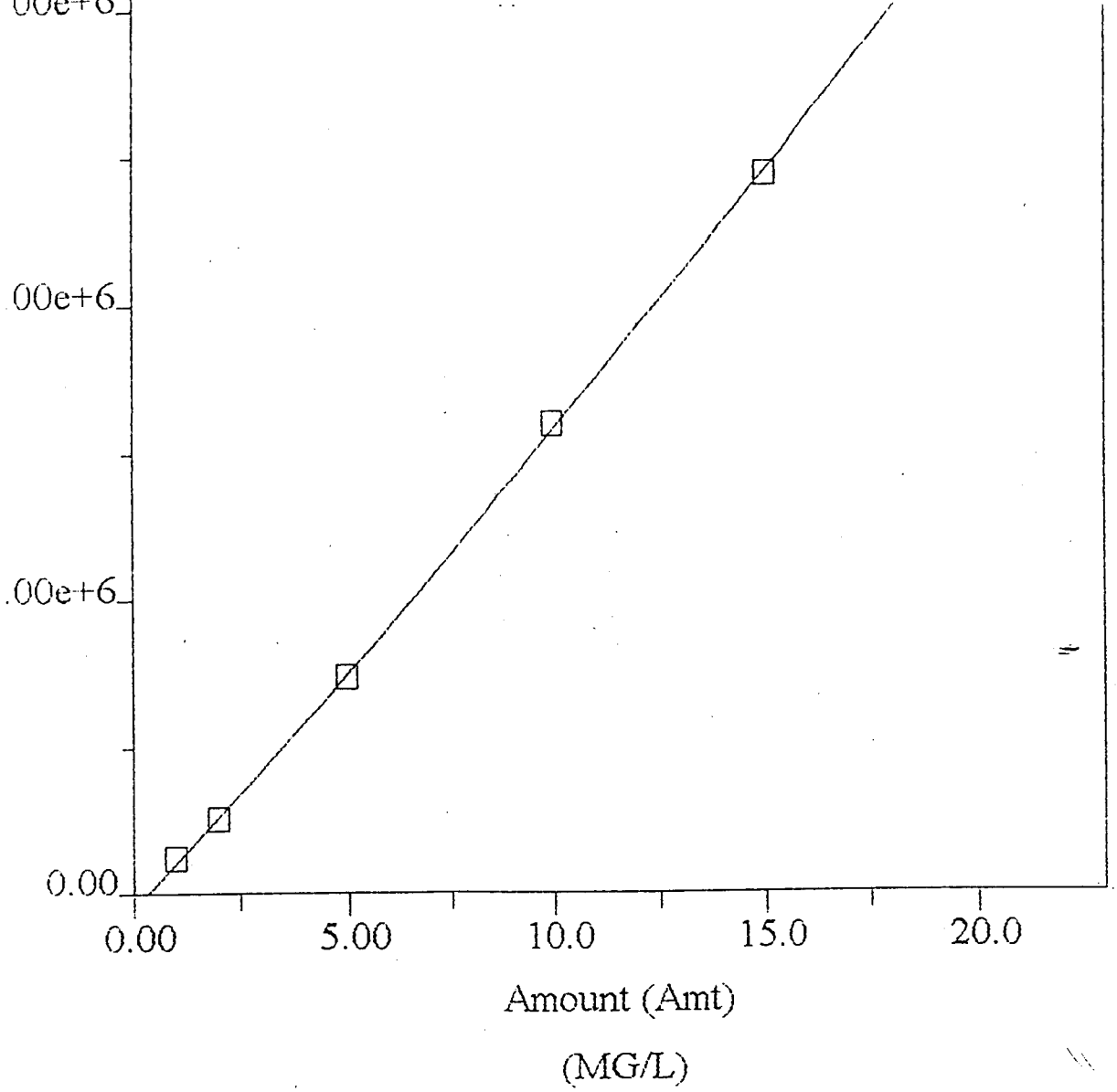
$r^2 = 0.999891$

Amt = -1.666690e-013 * Resp² + 6.412661e-006 * Resp + 0.3086

Standard: External

Calibration: Area





Component: CHLORIDE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

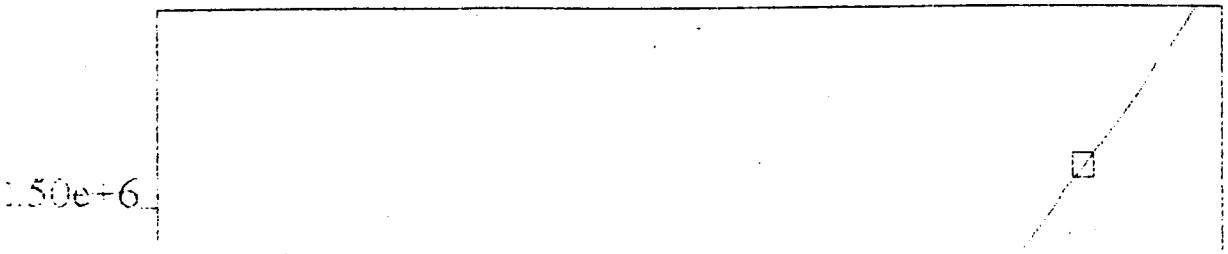
$r^2 = 0.999902$

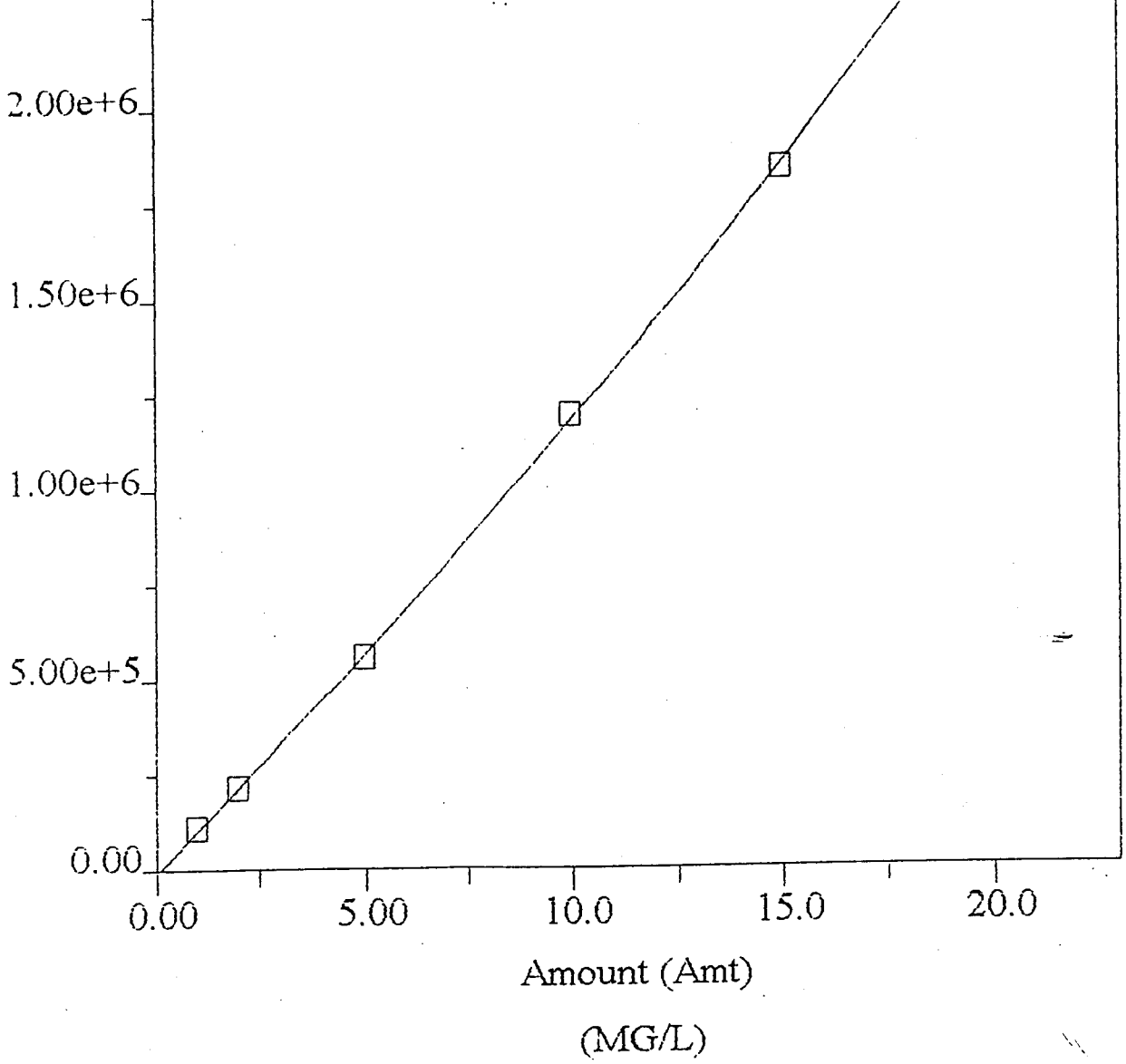
Amt = -4.913150e-013 * Resp^2 + 8.964130e-006 *

Resp + 0.0905

Standard: External

Calibration: Area





Component: NITRITE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

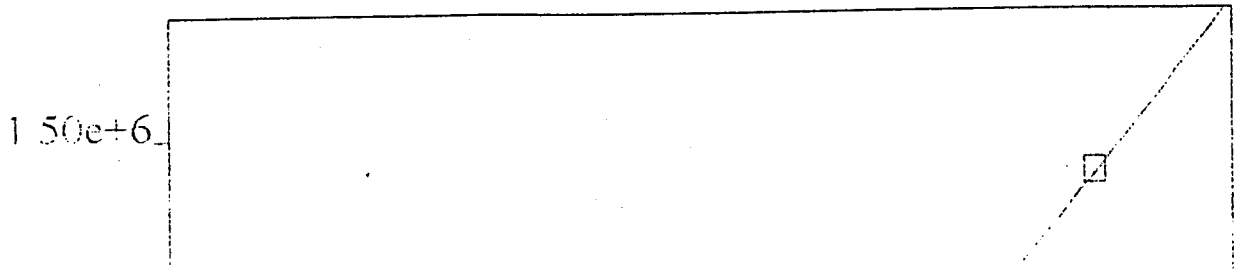
$r^2 = 0.999859$

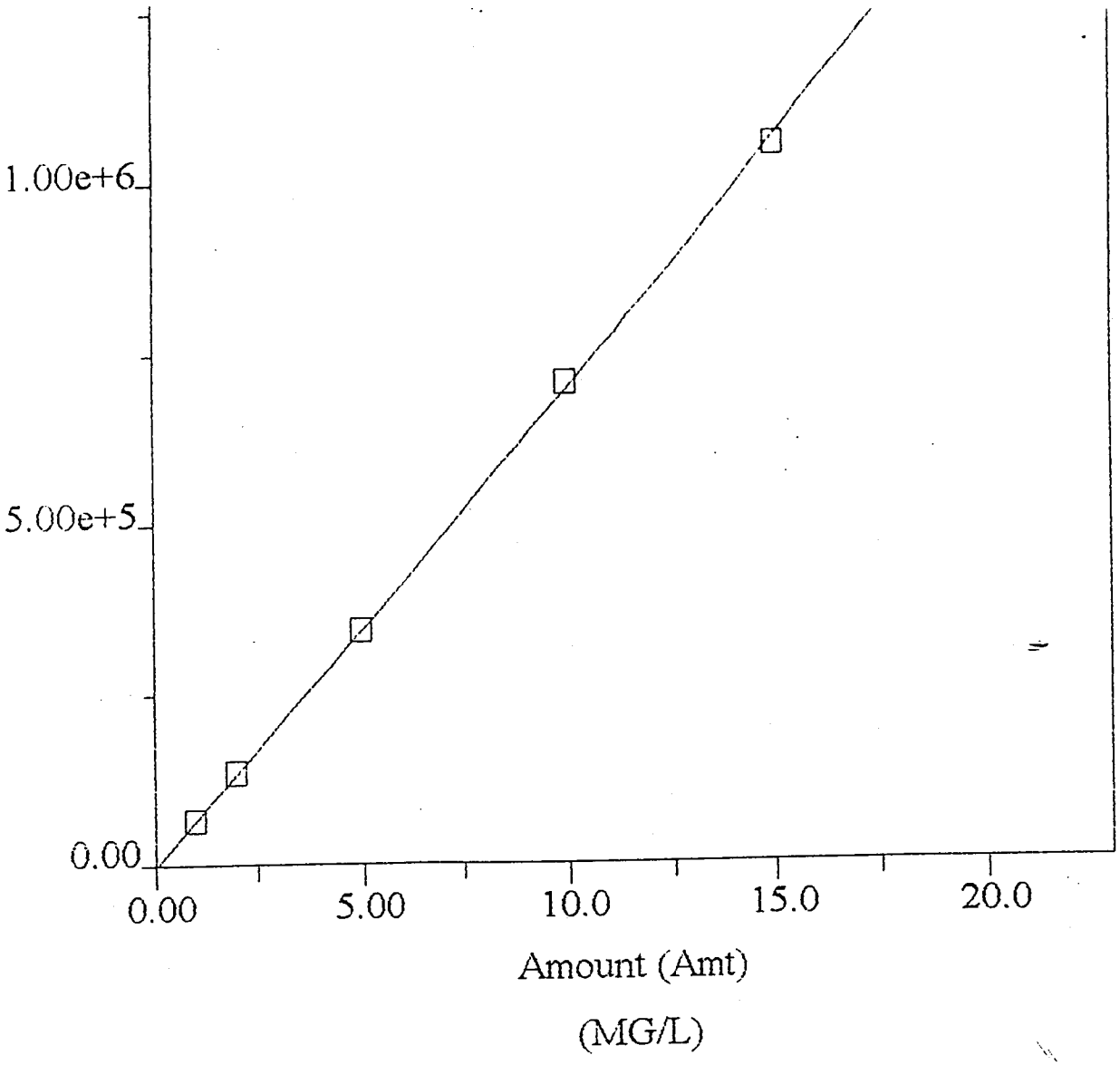
Amt = -6.358475e-013 * Resp^2 + 1.474889e-005 *

Resp + 0.03992

Standard: External

Calibration: Area





Component: BROMIDE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

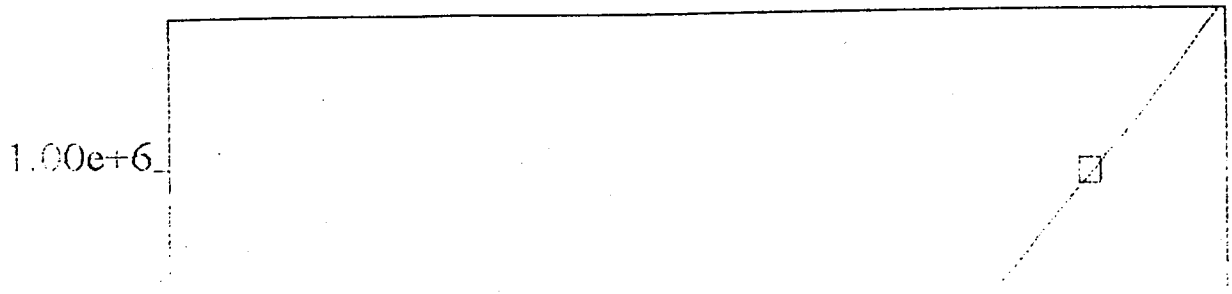
$r^2 = 0.999799$

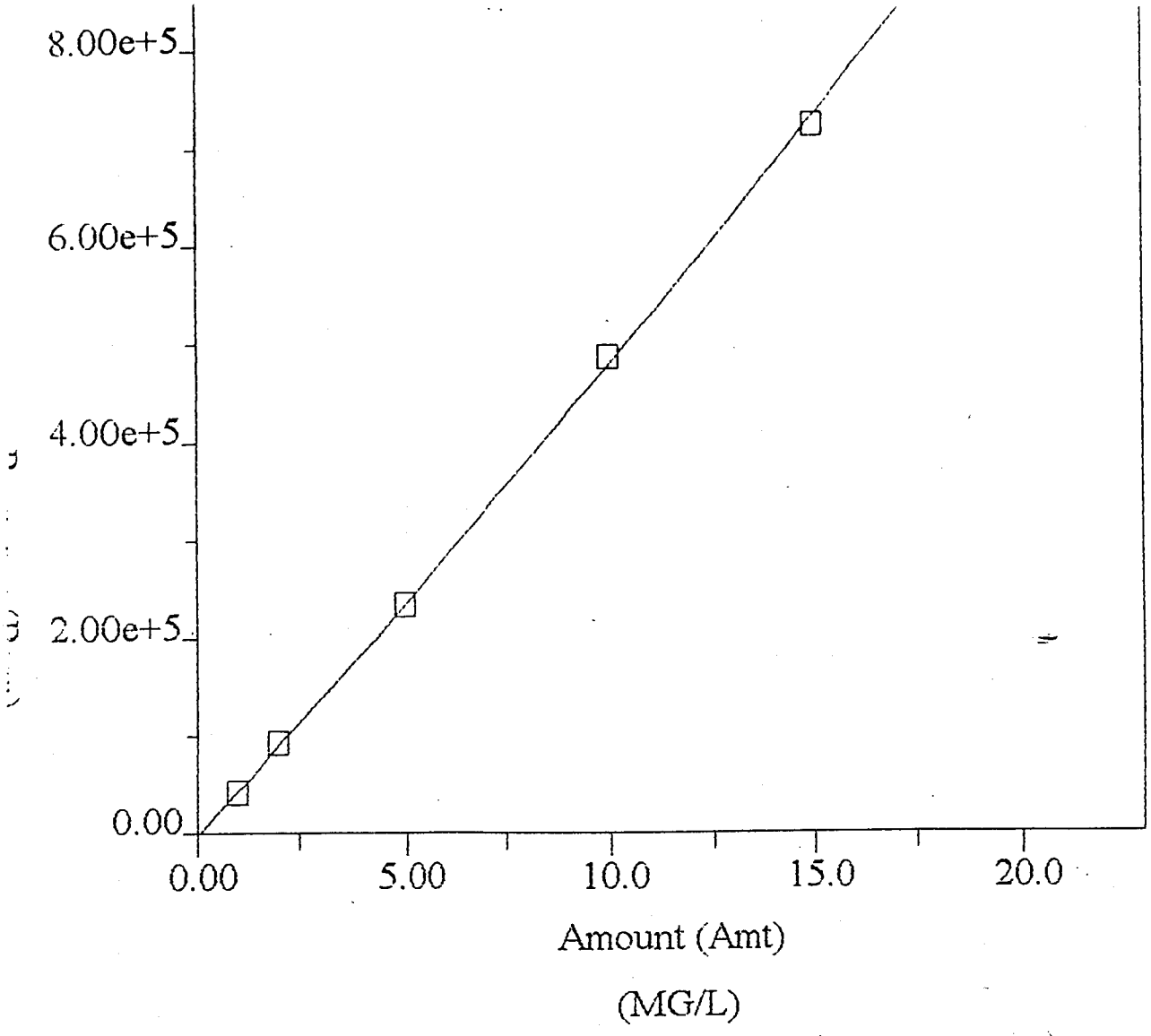
Amt = -1.177613e-012 * Resp^2 + 2.134629e-005 *

Resp + 0.07798

Standard: External

Calibration: Area





Component: NITRATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

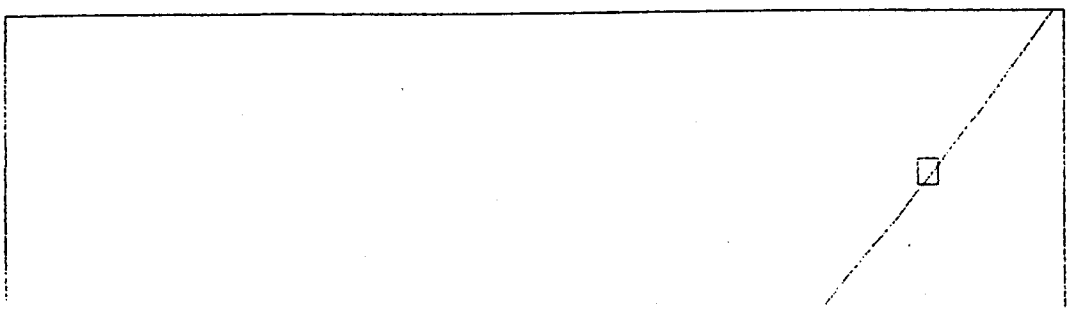
$r^2 = 0.999577$

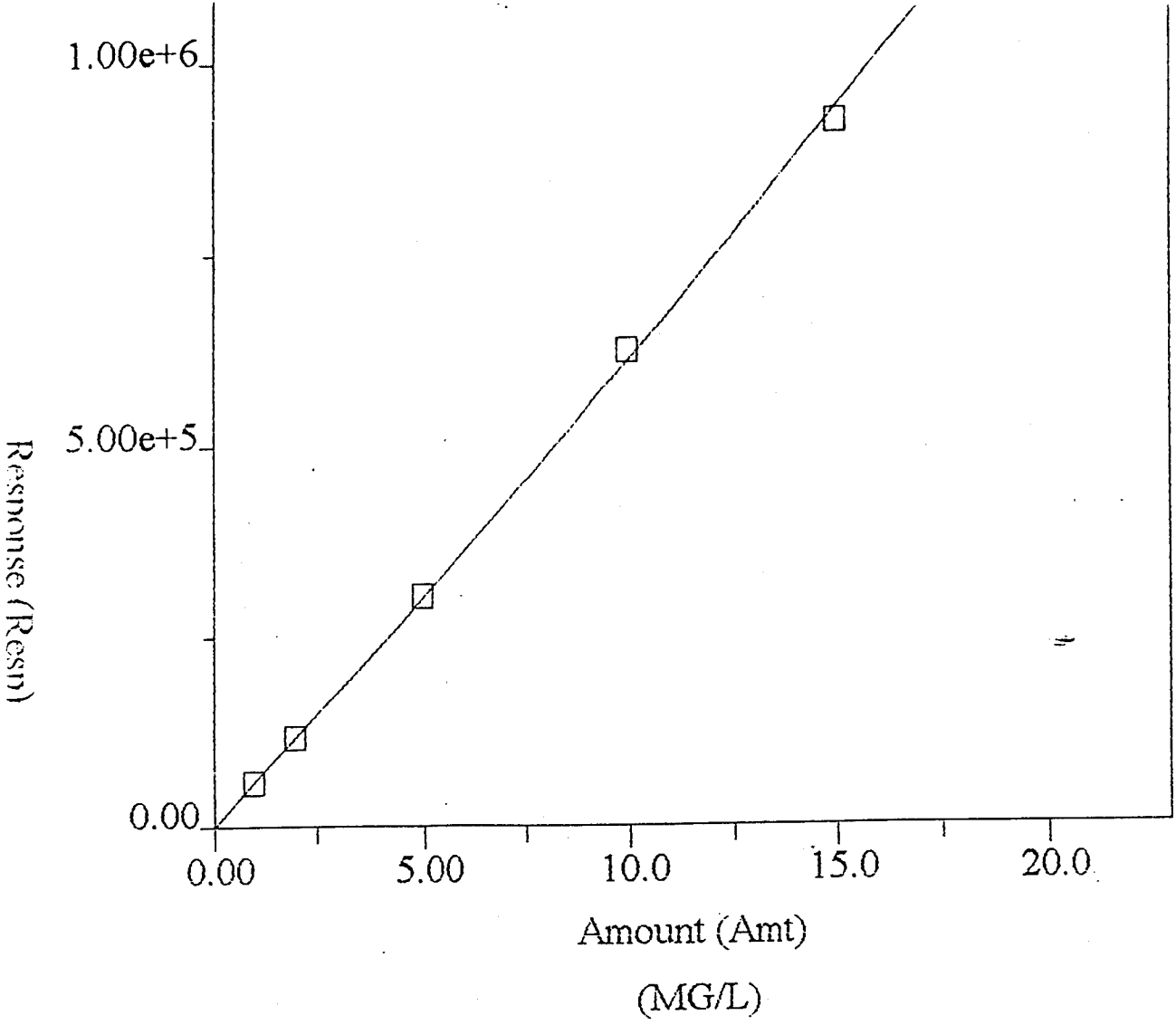
Amt = -1.115373e-012 * Resp² + 1.701592e-005 *

Resp + 0.003283

Standard: External

Calibration: Area





Component: PHOSPHATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 PM

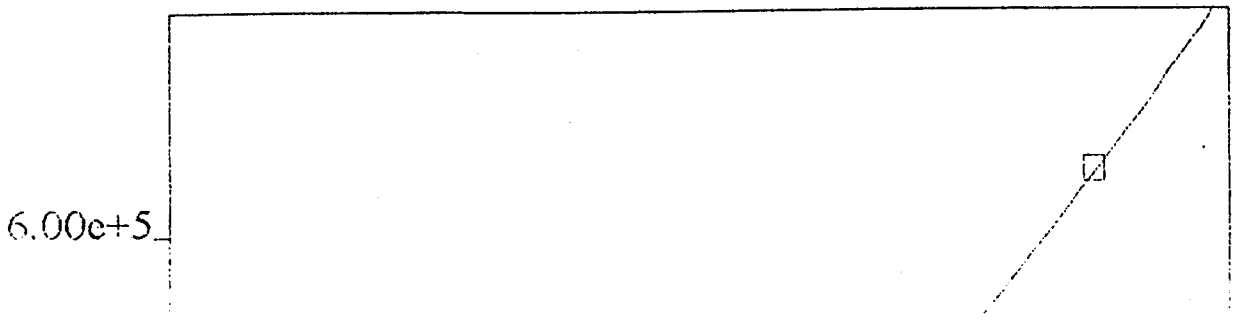
$r^2 = 0.999846$

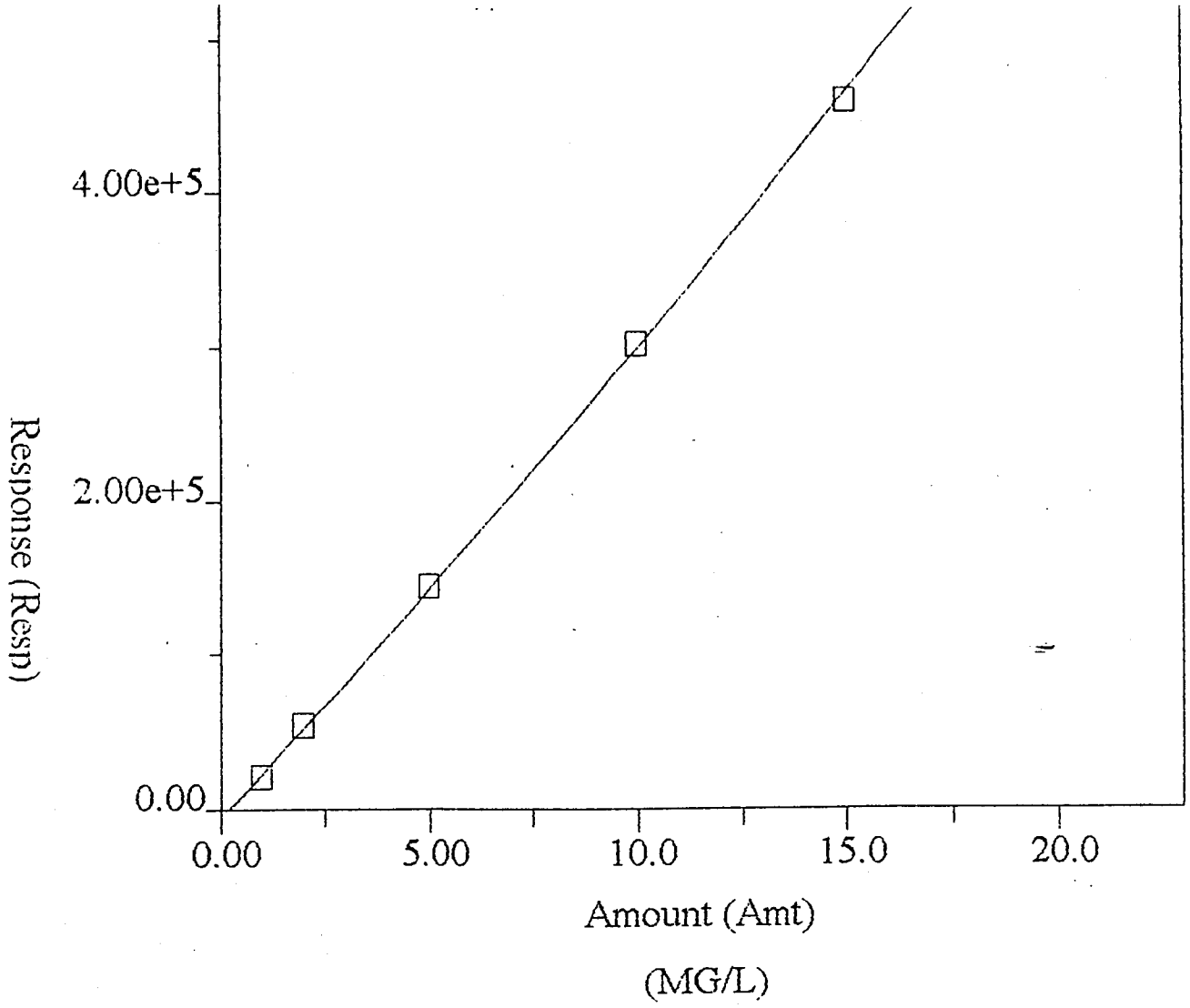
Amt = -5.106101e-012 * Resp^2 + 3.432998e-005 *

Resp + 0.2035

Standard: External

Calibration: Area





Component: SULFATE; Fit Type: Quadratic

Method: c:\peaknet\method\acidscan.met; Updated: 11/16/99 1:51:23 F

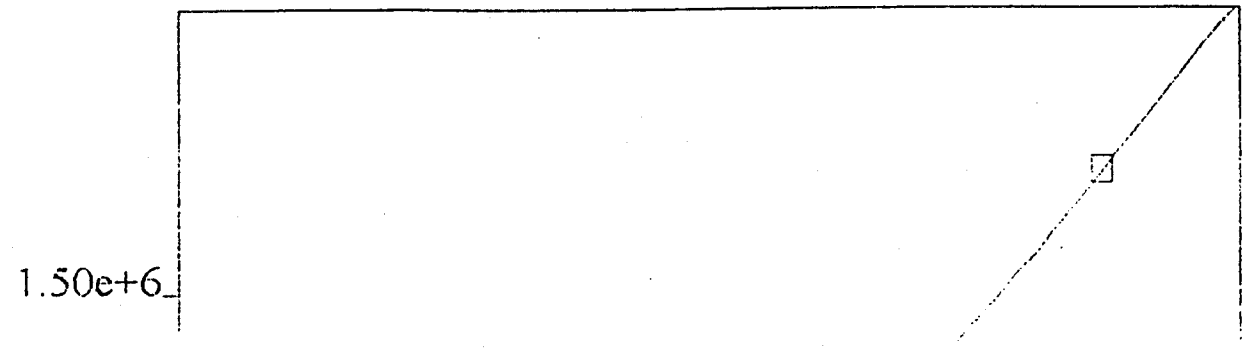
$r^2 = 0.999976$

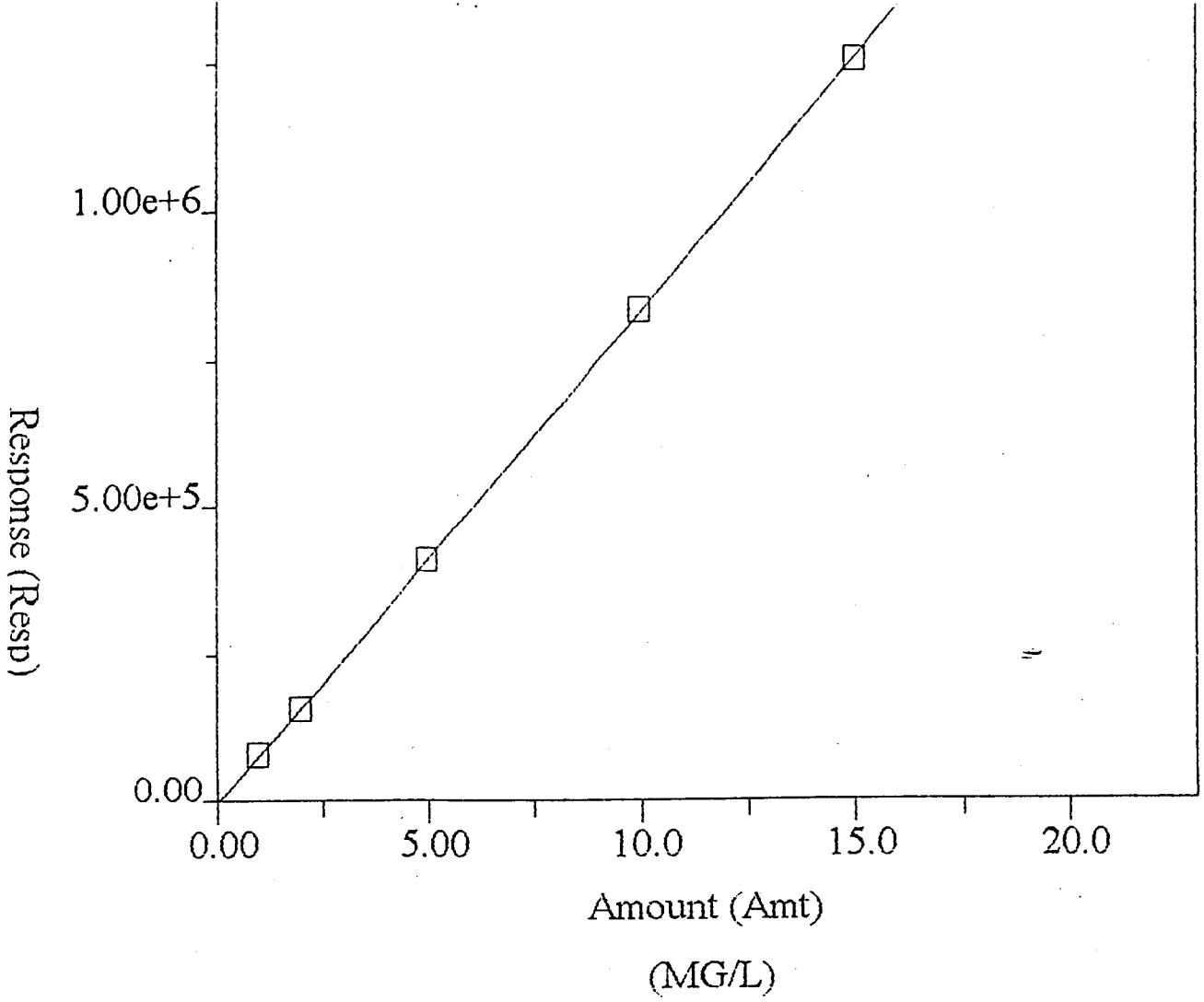
Amt = -2.367913e-013 * Resp² + 1.220891e-005 *

Resp + 0.04226

Standard: External

Calibration: Area





Data File	: C:\PEAKNET\DATA\11169008.DXD	Report Date	: 11/16/99 2:05:00 P
Sample Name	: METH BLK - B01	Collected	: 11/16/99 1:52:53 P
Inject #	: 8	Vial #	: B01
Method File	: c:\peaknet\method\acidscan.met	Calibrated	: 11/16/99 1:51:23 P
System Name	: ANIONS	Detector	: CD20
Column Type	:	Operator	: DK
Data Points	: 3600	Rate	: 5.00 Hz
Module Name	: S/N 96020568 ID:24 Of 15	Moduleware	: 1.17

Calibration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
External	50	1	0.00	12.00	10	10.00	0.94

Filter type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delt
0	0.00	FLUORIDE	0.000	0	0	0	0.0
1	3.08	CHLORIDE	0.095	96	550	1	2.7
0	0.00	NITRITE	0.000	0	0	0	0.0
0	0.00	BROMIDE	0.000	0	0	0	0.0
0	0.00	NITRATE	0.000	0	0	0	0.0
0	0.00	PHOSPHATE	0.000	0	0	0	0.0

Totals	0.095	96	550	

********** Component Report: Components Found **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	3.08	CHLORIDE	0.095	96	550	1	2.78
		Totals	0.095	96	550		

********** Components Not Found In This Run **********

Name	Adjusted Ret Time	Reference Peak
FLUORIDE	2.08	0
NITRITE	3.62	0
BROMIDE	4.58	0
NITRATE	5.37	0
PHOSPHATE	7.20	0
SULFATE	8.70	0

********** Peak Report: All Peaks **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

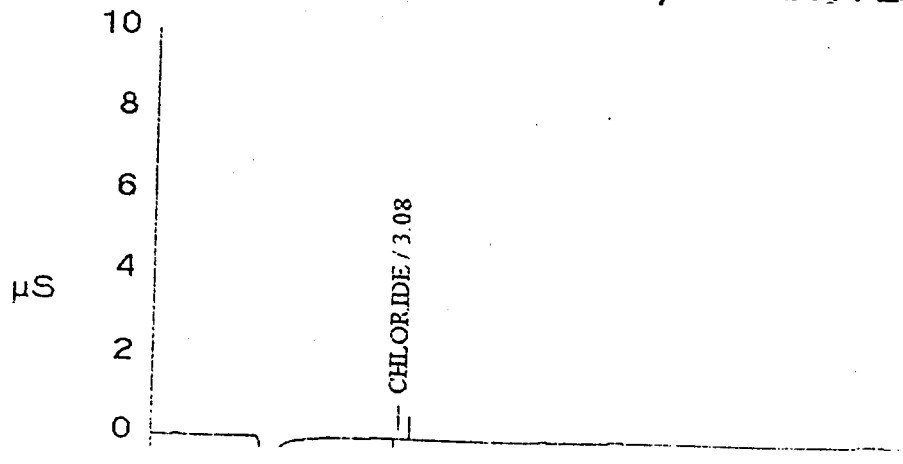
Schedule: \peaknet\schedule\11169901.sch
Release 4.30 Page 1 of 2 11/16/99 2:05:00 PM

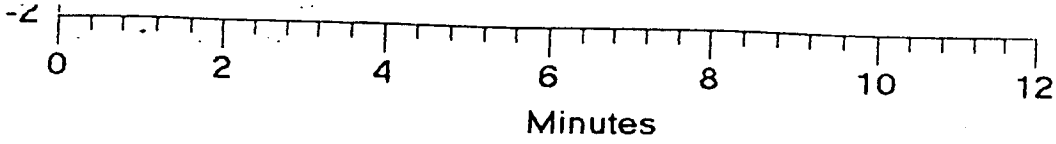
1	3.08	CHLORIDE	0.095	96	550	1	2.78
		Totals	0.095	96	550		

********** Peak Report: Unknown Peaks **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
		Totals	0.000	0	0		

File: 11169008.DXD Sample METH BLK - B01





Data File : C:\PEAKNET\DATA\11169009.DXD
Sample Name: IPC - B02
Inject # : 9
Method File: c:\peaknet\method\acidscan.met
System Name: ANIONS
Column Type:
Data Points: 3600
Module Name: S/N 96020568 ID:24 Of 15

Report Date: 11/16/99 2:18:36 PM
Collected : 11/16/99 2:06:29 PM
Vial # : B02
Calibrated : 11/16/99 1:51:23 PM
Detector : CD20
Operator : DK
Rate : 5.00 Hz
Moduleware : 1.17

alibration	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
xternal	50	1	0.00	12.00	10	10.00	0.94

ilter type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Pk. Num	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.80
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	228906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.93
7	8.78	SULFATE	4.809	17734	393444	1	0.96

********** Component Report: Components Found **********

k. m	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.80
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	228906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.93
7	8.78	SULFATE	4.809	17784	393444	1	0.96
		Totals	34.419	248188	2663354		

********** Peak Report: All Peaks **********

.. m	Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
1	2.10	FLUORIDE	4.791	85068	712236	1	0.80
2	3.03	CHLORIDE	4.850	67772	547363	2	1.11
3	3.67	NITRITE	4.845	31065	330515	2	1.38
4	4.67	BROMIDE	4.903	18956	228906	2	1.82
5	5.48	NITRATE	5.062	20279	303296	2	2.17
6	7.27	PHOSPHATE	5.159	7265	147593	1	0.93

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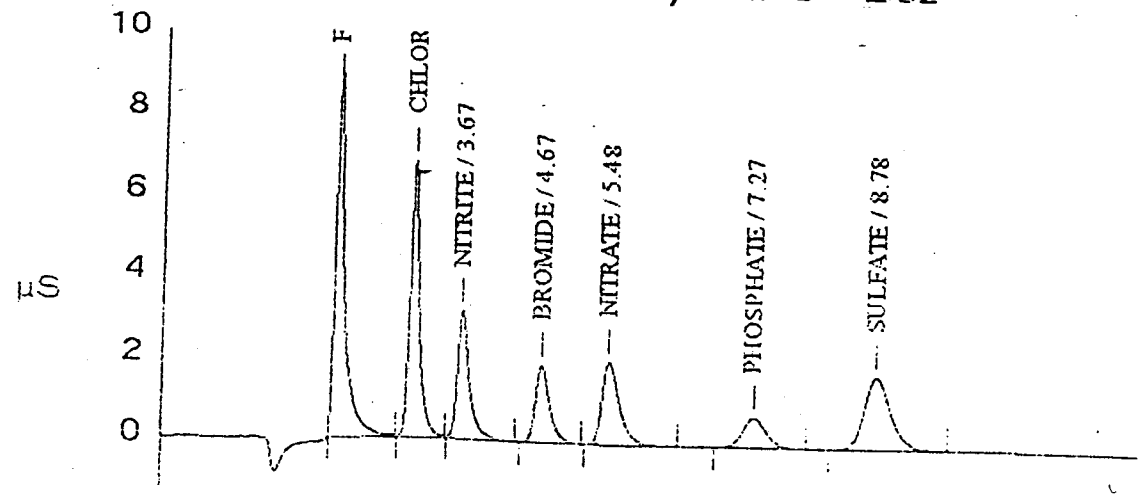
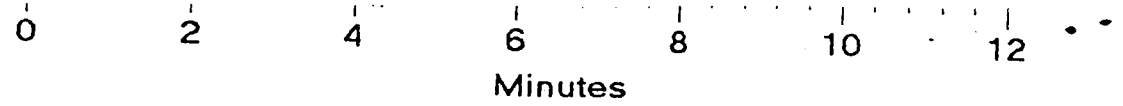
7	8.78	SULFATE	4.809	17784	393444	1	0.96
		Totals	34.419	248188	2663354		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169009.DXD Sample IPC - B02





File : C:\PEAKNET\DATA\11169010.DXD		Report Date:	11/16/99 2:32:20 PM
e Name: QCS - B03		Collected :	11/16/99 2:20:12 PM
t # : 10		Vial # :	B03
d File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
m Name: ANIONS		Detector :	CD20
n Type:		Operator :	DK
Points: 3600		Rate :	5.00 Hz
e Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.85	NITRITE	9.989	88122	695433	2	0.92
4.83	BROMIDE	10.035	40320	479134	2	1.09
5.48	NITRATE	10.112	42344	619199	2	1.24
7.15	PHOSPHATE	10.124	15247	302606	1	0.69
[illegible]	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	558383	5700589		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.65	NITRITE	9.989	66122	695433	2	0.92
4.63	BROMIDE	10.035	40320	479134	2	1.09
5.43	NITRATE	10.112	42344	619199	2	1.24
7.25	PHOSPHATE	10.124	15247	302606	1	0.69
8.77	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	556683	5700589		

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.10	FLUORIDE	10.121	206516	1596379	1	0.80
3.02	CHLORIDE	10.074	148491	1191495	2	0.56
3.65	NITRITE	9.989	66122	695433	2	0.92
4.63	BROMIDE	10.035	40320	479134	2	1.09
5.43	NITRATE	10.112	42344	619199	2	1.24
7.25	PHOSPHATE	10.124	15247	302606	1	0.69

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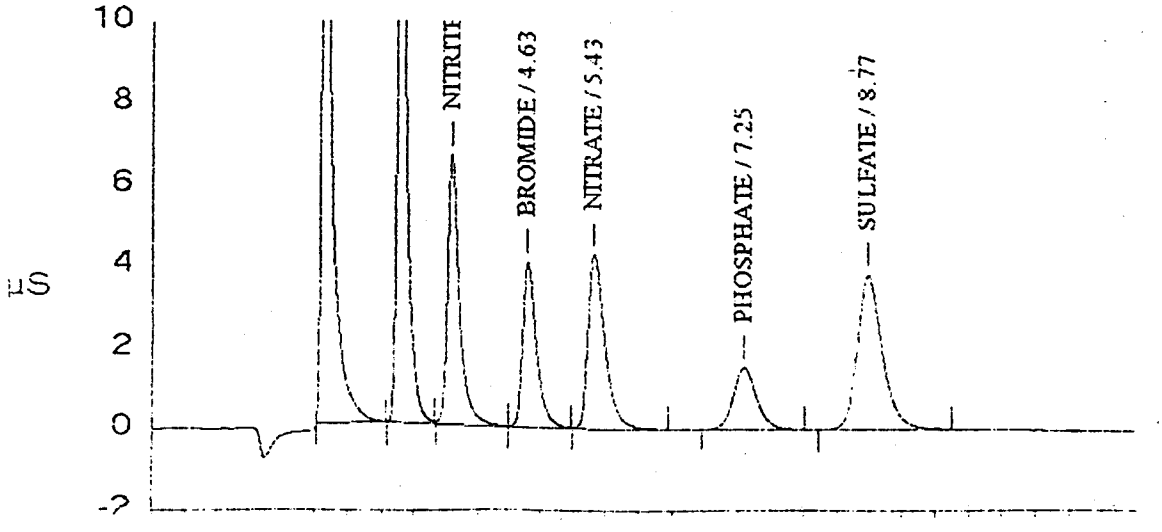
8.77	SULFATE	9.851	37642	816342	1	0.77
	Totals	70.307	556683	5700589		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169010.DXD Sample QCS - B03



Minutes

File :	C:\PEAKNET\DATA\11169011.DXD	Report Date:	11/16/99 2:46:02 PM
e Name:	LCS - B04	Collected :	11/16/99 2:33:55 PM
t # :	11	Vial # :	B04
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.08	CHLORIDE	10.061	153279	1189895	2	1.11
3.86	NITRITE	9.860	64400	686115	2	0.92
4.80	BROMIDE	9.796	39246	467311	2	1.09
5.48	NITRATE	10.115	42875	619377	2	1.55
[illegible]	PHOSPHATE	10.071	15845	300910	1	0.83
[illegible]	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	561106	5631955		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.03	CHLORIDE	10.061	153279	1189895	2	1.11
3.65	NITRITE	9.860	64400	686115	2	0.92
4.63	BROMIDE	9.796	39246	467311	2	1.09
5.45	NITRATE	10.115	42675	619377	2	1.55
7.27	PHOSPHATE	10.071	15345	300910	1	0.93
8.78	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	562106	5631955		

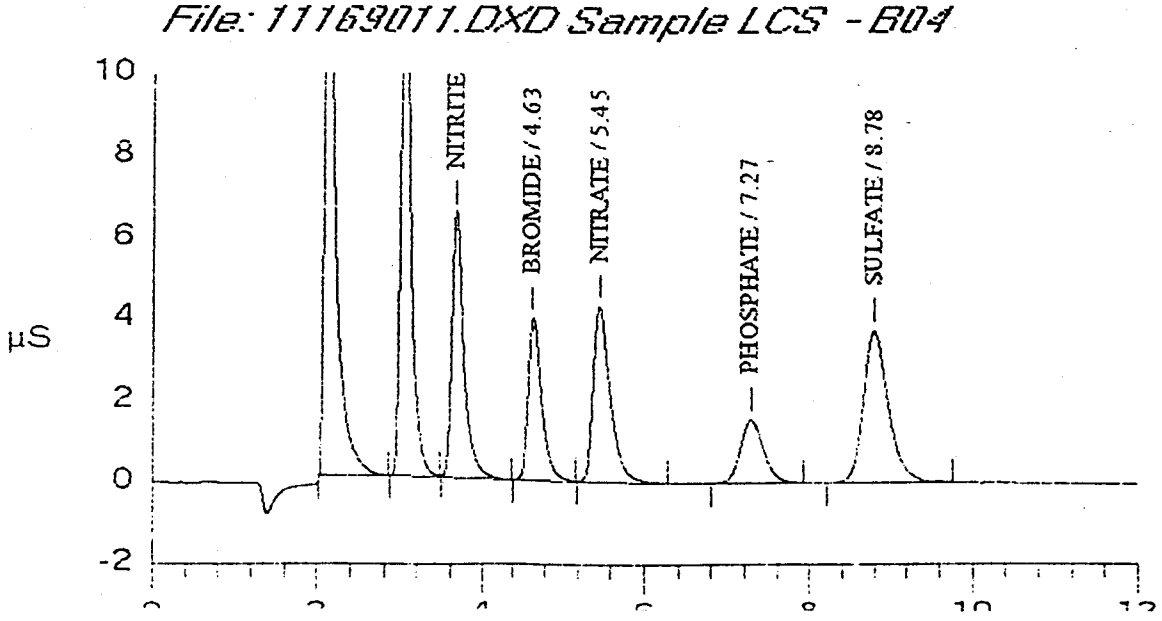
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	9.964	210267	1569664	1	1.60
3.03	CHLORIDE	10.061	153279	1189895	2	1.11
3.65	NITRITE	9.860	64400	686115	2	0.92
4.63	BROMIDE	9.796	39246	467311	2	1.09
5.45	NITRATE	10.115	42675	619377	2	1.55
7.27	PHOSPHATE	10.071	15345	300910	1	0.93

8.78	SULFATE	9.642	36894	798684	1	0.96
	Totals	69.509	562106	5631955		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		



Minutes

File : C:\PEAKNET\DATA\11169012.DXD	Report Date:	11/16/99 2:59:38 PM	
e Name: METH BLK - B01	Collected :	11/16/99 2:47:31 PM	
t # : 12	Vial # :	B01	
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM	
m Name: ANIONS	Detector :	CD20	
n Type:	Operator :	DK	
Points: 3600	Rate :	5.00 Hz	
e Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17	

ution	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
0.00	NITRITE	0.000	0	0	0	0.00
0.00	BROMIDE	0.000	0	0	0	0.00
0.00	NITRATE	0.000	0	0	0	0.00
0.00	PHOSPHATE	0.000	0	0	0	0.00
4.38	SULFATE	0.123	369	6581	1	2.11
	Totals	0.560	953	11228		

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
8.88	SULFATE	0.123	369	6581	1	2.11
	Totals	0.560	953	11228		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
:E	3.62	0
:E	4.58	0
:E	5.37	0
:ATE	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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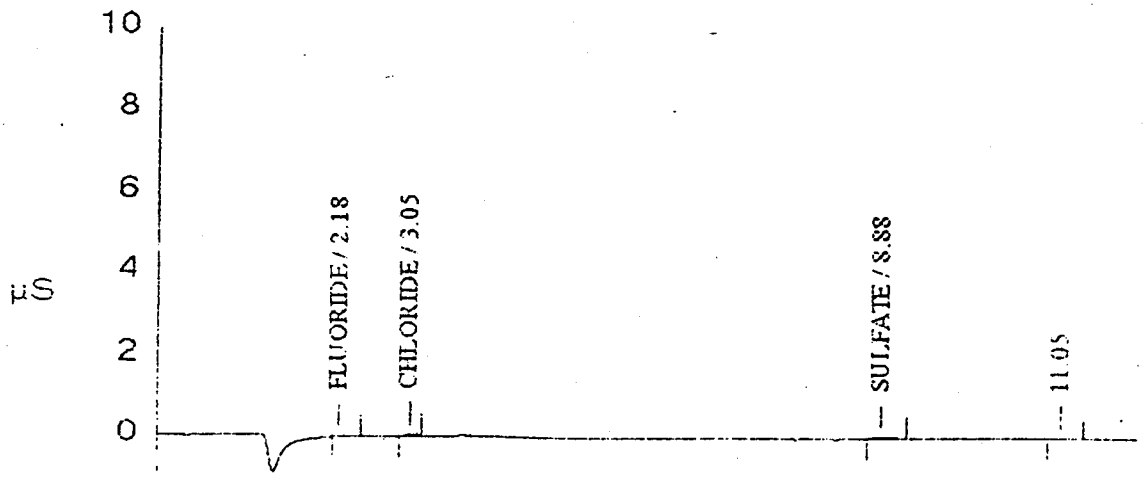
:e 4.30 Page 1 of 2 11/16/99 2:59:38 PM

2.18	FLUORIDE	0.318	131	1398	1	4.80
3.05	CHLORIDE	0.120	454	3249	1	1.67
8.88	SULFATE	0.123	369	6581	1	2.11
11.05		0.000	243	3334	1	
	Totals	0.560	1197	14562		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
11.05		0.000	243	3334	1	
	Totals	0.000	243	3334		

File: 11169012.DXD Sample METH BLK - B01



********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.17	FLUORIDE	0.458	2606	23326	1	4.00
3.13	CHLORIDE	10.348	119908	1226765	2	4.44
3.82	NITRITE	3.874	19375	262941	2	5.53
0.00	BROMIDE	0.000	0	0	0	0.00
5.13	NITRATE	-1280.148	2610590	42354251	2	-2.48
7.38	PHOSPHATE	1.961	2533	51576	2	2.55
8.42	SULFATE	-385.798	2550295	73676186	2	-3.26
	Totals	-1649.306	5305307	117595045		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.17	FLUORIDE	0.458	2606	23326	1	4.00
3.13	CHLORIDE	10.348	119908	1226765	2	4.44
3.82	NITRITE	3.874	19375	262941	2	5.53
5.28	NITRATE	-1280.148	2610590	42354251	2	-2.48
7.38	PHOSPHATE	1.961	2533	51576	2	2.55
8.42	SULFATE	-385.798	2550295	73676186	2	-3.26
	Totals	-1649.306	5305307	117595045		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
E	4.58	0

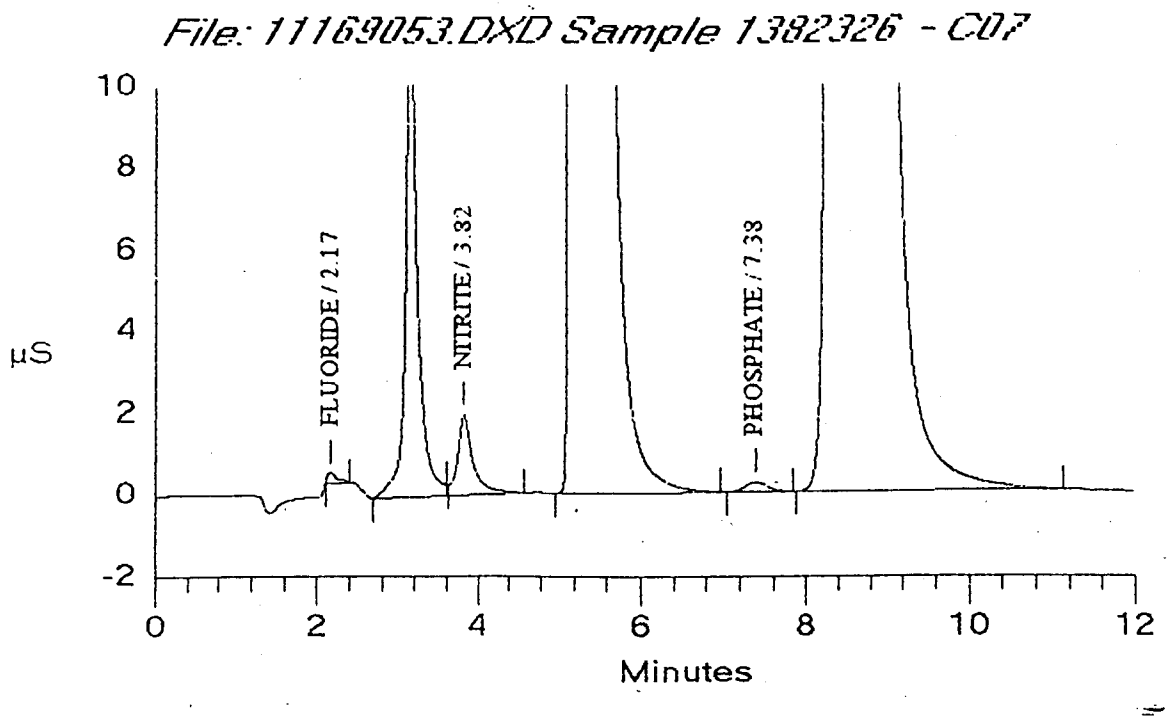
********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

2.17	FLUORIDE	0.458	2606	23326	1	4.00
3.13	CHLORIDE	10.348	119908	1226765	2	4.44
3.82	NITRITE	3.874	19375	262941	2	5.53
5.28	NITRATE	-1280.148	2610590	42354251	2	-2.48
7.38	PHOSPHATE	1.961	2533	51576	2	2.55
8.42	SULFATE	-385.798	2550295	73676186	2	-3.26
	Totals	-1649.306	5305307	117595045		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		



File :	C:\PEAKNET\DATA\11169054.DXD	Report Date:	11/17/99 12:59:19 AM
e Name:	1382327 - C08	Collected :	11/17/99 12:47:12 AM
t # :	54	Vial # :	C08
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.20	FLUORIDE	0.401	1356	14468	1	5.60
3.17	CHLORIDE	11.801	119652	1416309	2	5.56
3.85	NITRITE	4.212	20166	286396	2	6.45
0.00	BROMIDE	0.000	0	0	0	0.00
5.23	NITRATE	-2546.155	3509724	56011486	2	-2.48
7.40	PHOSPHATE	1.619	2019	41502	2	2.78
8.37	SULFATE	-858.720	2973801	91287641	2	-3.83
	Totals	-3386.841	6626718	149057803		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.20	FLUORIDE	0.401	1356	14468	1	5.60
3.17	CHLORIDE	11.801	119652	1416309	2	5.56
3.85	NITRITE	4.212	20166	286396	2	6.45
5.23	NITRATE	-2546.155	3509724	56011486	2	-2.48
7.40	PHOSPHATE	1.619	2019	41502	2	2.78
8.37	SULFATE	-858.720	2973801	91287641	2	-3.83
	Totals	-3386.841	6626718	149057803		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
E	4.58	0

********** Peak Report: All Peaks **********

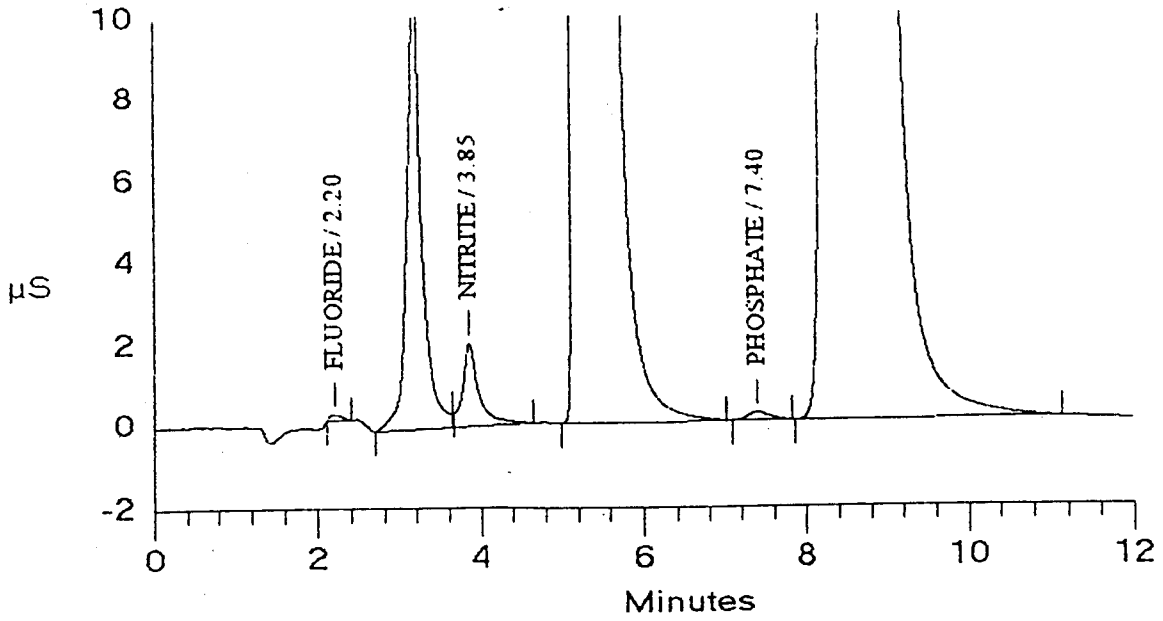
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

le: \peaknet\schedule\11169901.sch
e 4.30 Page 1 of 2 11/17/99 12:59:19 AM

2.20	FLUORIDE	0.401	1356	14468	1	5.60
3.17	CHLORIDE	11.801	119652	1416309	2	5.56
3.85	NITRITE	4.212	20166	286396	2	6.45
5.23	NITRATE	-2546.155	3509724	56011486	2	-2.48
7.40	PHOSPHATE	1.619	2019	41502	2	2.78
8.37	SULFATE	-858.720	2973801	91287641	2	-3.83
	Totals	-3386.841	6626718	149057803		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		



le: \peaknet\schedule\11169901.sch
e 4.30 Page 2 of 2 11/17/99 12:59:19 AM

File :	C:\PEAKNET\DATA\11169055.DXD	Report Date:	11/17/99 1:13:02 AM
e Name:	1382328 - C09	Collected :	11/17/99 1:00:54 AM
# :	55	Vial # :	C09
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Component Report: All Components

Time	Name	MG/L			Code	
2.16	FLUORIDE	0.321	420	2009	1	4.80
3.15	CHLORIDE	9.923	110998	1172129	2	5.00
3.83	NITRITE	3.786	18746	256833	2	5.99
0.00	BROMIDE	0.000	0	0	0	0.00
5.23	NITRATE	-1581.674	2835914	46049973	2	-2.46
7.38	PHOSPHATE	0.944	1035	21640	2	2.55
8.38	SULFATE	-683.921	2833778	85387488	1	-3.64
	Totals	-2250.621	5800891	132890073		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.16	FLUORIDE	0.321	420	2009	1	4.80
3.15	CHLORIDE	9.923	110998	1172129	2	5.00
3.83	NITRITE	3.786	18746	256833	2	5.99
5.23	NITRATE	-1581.674	2835914	46049973	2	-2.48
7.38	PHOSPHATE	0.944	1035	21640	2	2.55
8.38	SULFATE	-683.921	2833778	85387488	1	-3.64
	Totals	-2250.621	5800891	132890073		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
E	4.58	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

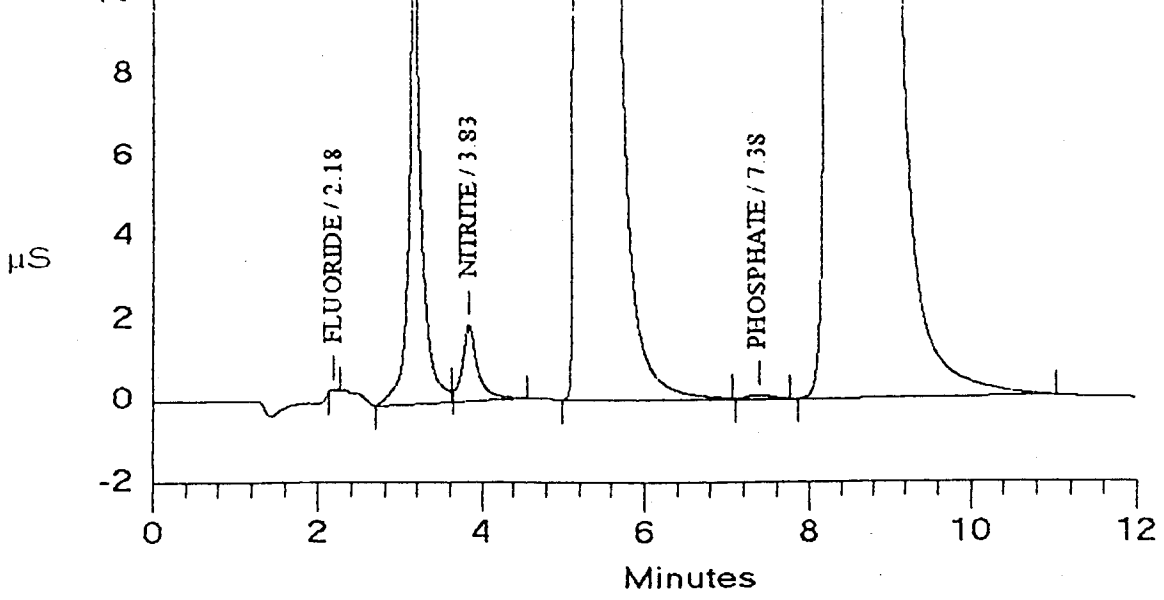
le: .peaknet\schedule\11169901.sch
e 4.80 Page 1 of 2 11/17/99 1:13:02 AM

2.16	FLUORIDE	0.321	420	2009	1	4.80
3.15	CHLORIDE	9.923	110998	1172129	2	5.00
3.83	NITRITE	3.786	18746	256833	2	5.99
5.23	NITRATE	-1581.674	2835914	46049973	2	-2.48
7.38	PHOSPHATE	0.944	1035	21640	2	2.55
8.38	SULFATE	-683.921	2833778	85387488	1	-3.64
	Totals	-2250.621	5800891	132890073		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169055.DXD Sample 1382328 - C09



File :	C:\PEAKNET\DATA\11169056.DXD	Report Date:	11/17/99 1:26:44 AM
e Name:	1382328 DUP - C10	Collected :	11/17/99 1:14:36 AM
t # :	56	Vial # :	C10
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

tion	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
	50	1	0.00	12.00	10	10.00	0.94

d: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Component Report: All Components

Component Concentration Area Pk. Type

2.15	FLUORIDE	0.401	2033	14431	1	3.20
3.13	CHLORIDE	10.236	118932	1212360	2	4.44
3.80	NITRITE	4.029	19723	273723	2	5.07
0.00	BROMIDE	0.000	0	0	0	0.00
5.22	NITRATE	-1503.995	2774980	45132726	3	-2.80
7.37	PHOSPHATE	0.577	594	10894	4	2.31
8.38	SULFATE	-480.496	2646576	77683422	1	-3.64
	Totals	-1969.248	5562837	124327556		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.15	FLUORIDE	0.401	2033	14431	1	3.20
3.13	CHLORIDE	10.236	118932	1212360	2	4.44
3.80	NITRITE	4.029	19723	273723	2	5.07
5.22	NITRATE	-1503.995	2774980	45132726	3	-2.80
7.37	PHOSPHATE	0.577	594	10894	4	2.31
8.38	SULFATE	-480.496	2646576	77683422	1	-3.64
	Totals	-1969.248	5562837	124327556		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
DE	4.58	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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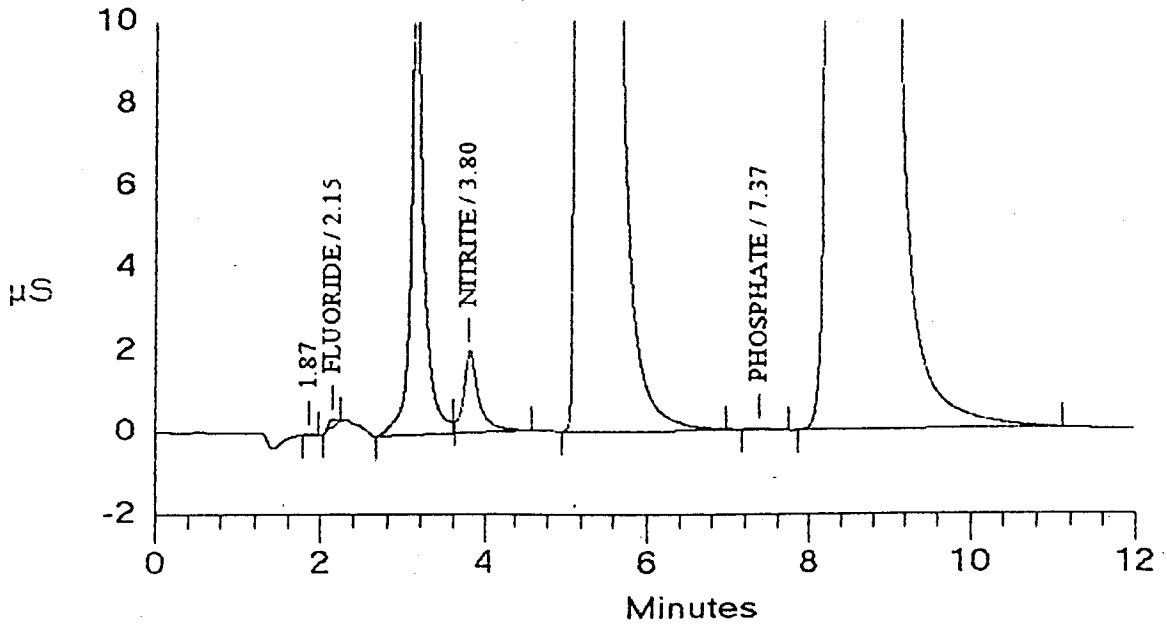
te 4.30 Page 1 of 2 11/17/99 1:26:44 AM

1.87		0.000	152	1030	1	
2.15	FLUORIDE	0.401	2033	14431	1	3.20
3.13	CHLORIDE	10.236	118932	1212360	2	4.44
3.80	NITRITE	4.029	19723	273723	2	5.07
5.22	NITRATE	-1503.995	2774980	45132726	3	-2.80
7.37	PHOSPHATE	0.577	594	10894	4	2.31
8.38	SULFATE	-480.496	2646576	77683422	1	-3.64
	Totals	-1969.248	5562989	124328586		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]		0.000	152	1030	1	
	Totals	0.000	152	1030		



File : C:\PEAKNET\DATA\11169057.DXD		Report Date:	11/17/99 1:40:20 AM
e Name: 1382328 MS - C11		Collected :	11/17/99 1:28:12 AM
t # : 57		Vial # :	C11
d File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
m Name: ANIONS		Detector :	CD20
n Type:		Operator :	DK
Points: 3600		Rate :	5.00 Hz
e Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
1	50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Component Report: All Components

Component Name	Concentration MG L	Height	Area	Bl. Code	%Delta

2.13	FLUORIDE	9.430	152888	1479360	1	2.40
3.15	CHLORIDE	19.018	279629	2437045	2	5.00
3.77	NITRITE	9.330	52182	648018	2	4.15
4.72	BROMIDE	10.087	41260	481675	2	2.91
5.23	NITRATE	-1247.884	2586665	41935223	2	-2.46
7.37	PHOSPHATE	6.510	8169	189008	2	2.31
8.42	SULFATE	-329.613	2487925	71131620	2	-3.26
	Totals	-1523.121	5608719	118301947		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	9.430	152888	1479360	1	2.40
3.15	CHLORIDE	19.018	279629	2437045	2	5.00
3.77	NITRITE	9.330	52182	648018	2	4.15
4.72	BROMIDE	10.087	41260	481675	2	2.91
5.23	NITRATE	-1247.884	2586665	41935223	2	-2.48
7.37	PHOSPHATE	6.510	8169	189008	2	2.31
8.42	SULFATE	-329.613	2487925	71131620	2	-3.26
	Totals	-1523.121	5608719	118301947		

********** Peak Report: All Peaks **********

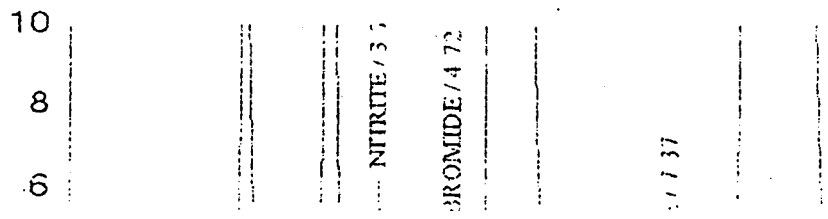
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	9.430	152888	1479360	1	2.40
3.15	CHLORIDE	19.018	279629	2437045	2	5.00
3.77	NITRITE	9.330	52182	648018	2	4.15
4.72	BROMIDE	10.087	41260	481675	2	2.91
5.23	NITRATE	-1247.884	2586665	41935223	2	-2.48
7.37	PHOSPHATE	6.510	8169	189008	2	2.31

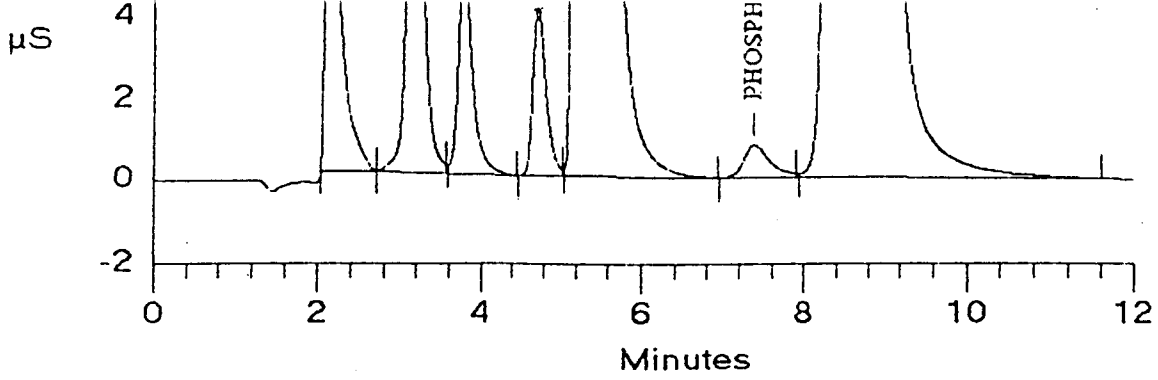
8.42	SULFATE	-329.613	2487925	71131620	2	-3.26
	Totals	-1523.121	5608719	118301947		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169057.DXD Sample 1382328 MS - C11





T.V. SPIKE = 10.00 mg/L

CHLORIDE $\frac{19.018 - 9.92}{10.00} \times 100 = 91\%$

File : C:\PEAKNET\DATA\11169058.DXD		Report Date:	11/17/99 1:54:02 AM
Name: 1382328 MSD - C12		Collected :	11/17/99 1:41:55 AM
# : 58		Vial # :	C12
File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
Name: ANIONS		Detector :	CD20
Type:		Operator :	DK
Points: 3600		Rate :	5.00 Hz
Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

tion	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
L	50	1	0.00	12.00	10	10.00	0.94

: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Component Report: All Components

Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

3.77	NITRITE	9.193	51489	638154	2	4.15
4.72	BROMIDE	9.971	40850	475933	2	2.91
5.23	NITRATE	-1189.081	2522374	41158059	2	-2.48
7.38	PHOSPHATE	6.392	8005	185375	2	2.55
8.42	SULFATE	-298.177	2440736	69643555	2	-3.26
	Totals	-1433.419	5494918	115993333		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	9.494	155148	1490124	1	2.40
3.15	CHLORIDE	18.789	276315	2402134	2	5.00
3.77	NITRITE	9.193	51489	638154	2	4.15
4.72	BROMIDE	9.971	40850	475933	2	2.91
5.23	NITRATE	-1189.081	2522374	41158059	2	-2.48
7.38	PHOSPHATE	6.392	8005	185375	2	2.55
8.42	SULFATE	-298.177	2440736	69643555	2	-3.26
	Totals	-1433.419	5494918	115993333		

********** Peak Report: All Peaks **********

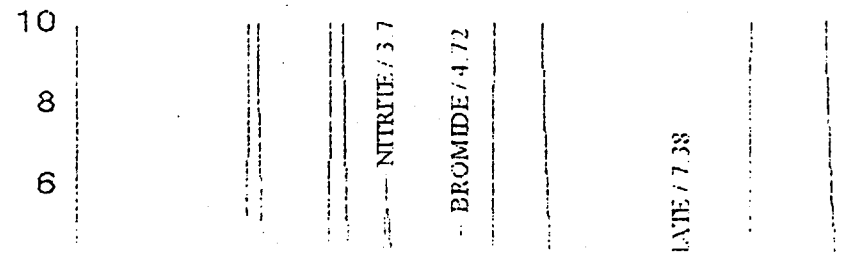
Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.13	FLUORIDE	9.494	155148	1490124	1	2.40
3.15	CHLORIDE	18.789	276315	2402134	2	5.00
3.77	NITRITE	9.193	51489	638154	2	4.15
4.72	BROMIDE	9.971	40850	475933	2	2.91
5.23	NITRATE	-1189.081	2522374	41158059	2	-2.48
7.38	PHOSPHATE	6.392	8005	185375	2	2.55

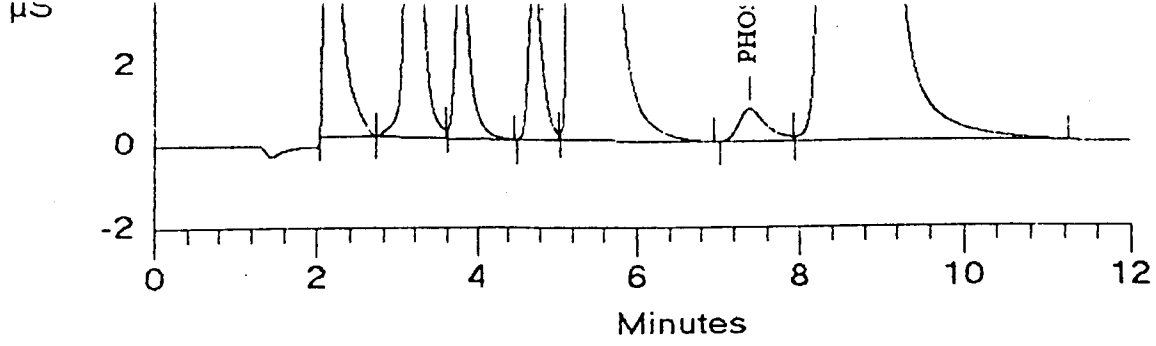
8.42	SULFATE	-298.177	2440736	69643555	2	-3.26
	Totals	-1433.419	5494918	115993333		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169058.DXD Sample 1382328 MSD - C12





T.V. SPIKE = 10.00 mg/L

CHLORIDE $\frac{18.789 - 9.92}{10.00} \times 100 = 89\%$

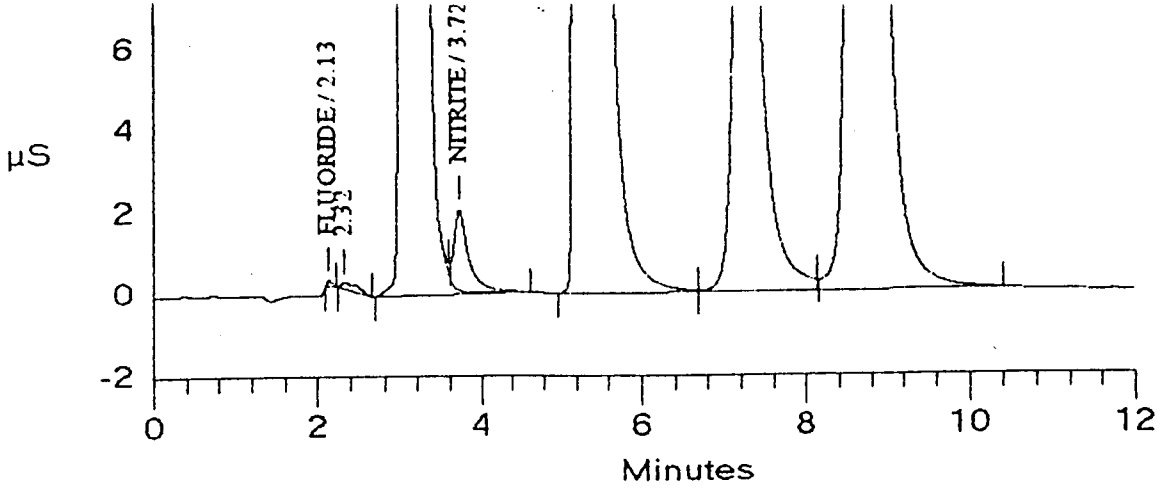
File : C:\PEAKNET\DATA\11169059.DXD	Report Date:	11/17/99 2:07:38 AM
e Name: 1361343 - C13	Collected :	11/17/99 1:55:31 AM
t # : 59	Vial # :	C13
d File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name: ANIONS	Detector :	CD20
n Type:	Operator :	DK
Points: 3600	Rate :	5.00 Hz
e Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

Type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

Component Report: All Components

Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
FLUORIDE	1.354	146%	7314	1	1.80



File : C:\PEAKNET\DATA\11169061.DXD	Report Date:	11/17/99 2:35:03 AM
Name: CONTROL 1:50 - C15	Collected :	11/17/99 2:22:55 AM
# : 61	Vial # :	C15
File: c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
Name: ANIONS	Detector :	CD20
Type:	Operator :	DK
ints: 3600	Rate :	5.00 Hz
Name: S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	FLUORIDE	0.000	0	0	0	0.00
	CHLORIDE	4.102	54731	466058	1	1.67
	NITRITE	0.000	0	0	0	0.00

7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112665	1317814		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.05	CHLORIDE	4.102	54781	459058	1	1.67
5.48	NITRATE	13.602	57161	846111	1	2.17
7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112665	1317814		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
DE	2.08	0
E	3.62	0
E	4.58	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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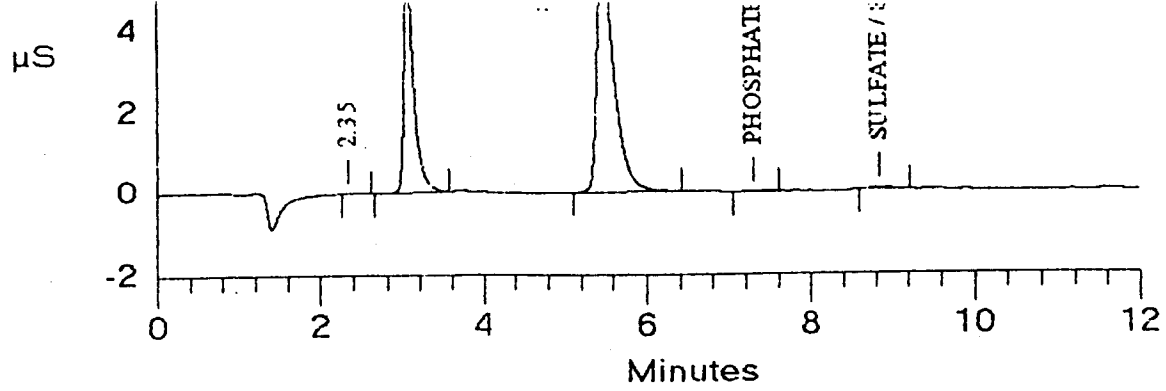
2.35		0.000	214	2658	1	
3.05	CHLORIDE	4.102	54781	459058	1	1.67
5.48	NITRATE	13.602	57161	846111	1	2.17
7.30	PHOSPHATE	0.328	192	3626	1	1.39
8.85	SULFATE	0.152	530	9019	1	1.72
	Totals	18.184	112679	1320471		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.35		0.000	214	2658	1	
	Totals	0.000	214	2658		

File: 11169061.DXD Sample CONTROL 1:50 - C15



File : C:\PEAKNET\DATA\11169062.DXD		Report Date:	11/17/99 2:48:38 AM
e Name: METH BLK - B01		Collected :	11/17/99 2:36:31 AM
t # : 62		Vial # :	B01
d File: c:\peaknet\method\acidscan.met		Calibrated :	11/16/99 1:51:23 PM
m Name: ANIONS		Detector :	CD20
n Type:		Operator :	DK
Points: 3600		Rate :	5.00 Hz
e Name: S/N 96020568	ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
.00	FLUORIDE	0.000	0	0	0	0.00
.77	CHLORITE	0.118	447	3024	1	2.22
.00	NITRITE	0.000	0	0	0	0.00
.00	BROMIDE	0.000	0	0	0	0.00
	NITRATE	0.000				

8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	863	11776		

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
3.07	CHLORIDE	0.118	447	3024	1	2.22
8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	863	11776		

********** Components Not Found In This Run **********

	Adjusted Ret Time	Reference Peak
IDE	2.08	0
IE	3.62	0
E	4.58	0
E	5.37	0
IATE	7.20	0

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta

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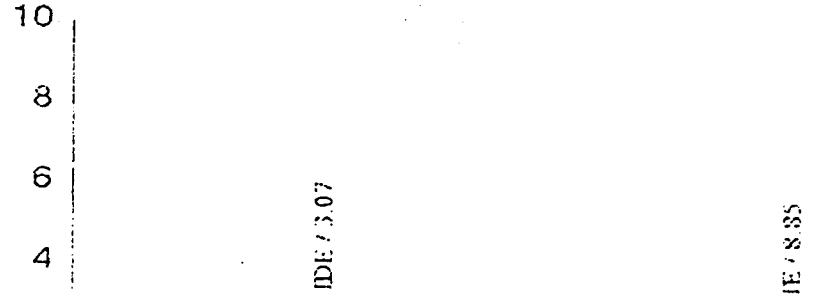
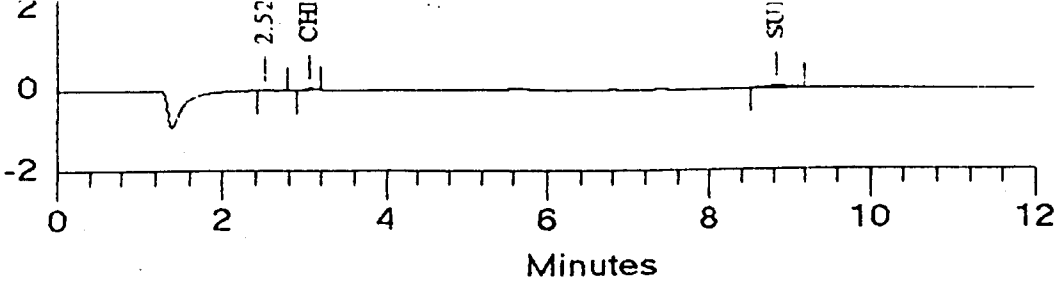
2.52		0.000	32	241	1	
3.07	CHLORIDE	0.118	447	3024	1	2.22
8.85	SULFATE	0.149	416	8752	1	1.72
	Totals	0.267	894	12017		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.52		0.000	32	241	1	
	Totals	0.000	32	241		

File: 11169062.DXD Sample METH BLK - B01





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e 4.30 Page 2 of 2 11/17/99 2:48:38 AM

File :	C:\PEAKNET\DATA\11169063.DXD	Report Date:	11/17/99 3:02:20 AM
e Name:	IPC - B02	Collected :	11/17/99 2:50:13 AM
t # :	63	Vial # :	B02
d File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
m Name:	ANIONS	Detector :	CD20
n Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
e Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

ation	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
al	50	-1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]	FLUORIDE	4.823	87385	717314	1	1.60
[illegible]	CHLORIDE	4.848	66390	547168	2	1.67
[illegible]	NITRITE	4.880	30445	332918	2	1.84
[illegible]	BROMIDE	4.901	[illegible]	128838	2	2.18
[illegible]	NITRATE	5.047	[illegible]	302430	2	2.80
[illegible]	[illegible]	5.[illegible]	[illegible]	[illegible]	1	[illegible]

Totals	34.321	247754	2665521

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	4.823	87385	717314	1	1.60
3.05	CHLORIDE	4.848	66890	547168	2	1.67
3.68	NITRITE	4.880	30445	332918	2	1.84
4.68	BROMIDE	4.901	18410	228838	2	2.18
5.52	NITRATE	5.047	19968	302430	2	2.80
7.30	PHOSPHATE	5.007	6954	142968	1	1.39
8.80	SULFATE	4.814	17703	393886	1	1.15
	Totals	34.321	247754	2665521		

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	4.823	87385	717314	1	1.60
3.05	CHLORIDE	4.848	66890	547168	2	1.67
3.68	NITRITE	4.880	30445	332918	2	1.84
4.68	BROMIDE	4.901	18410	228838	2	2.18
5.52	NITRATE	5.047	19968	302430	2	2.80
7.30	PHOSPHATE	5.007	6954	142968	1	1.39

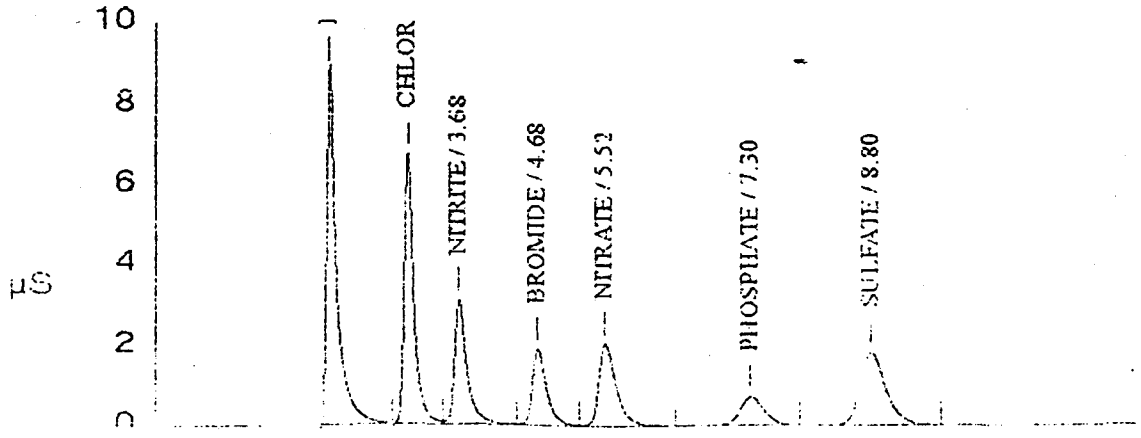
le: \peaknet\schedule\11169901.sch
e 4.30 11/17/99 3:02:20 AM

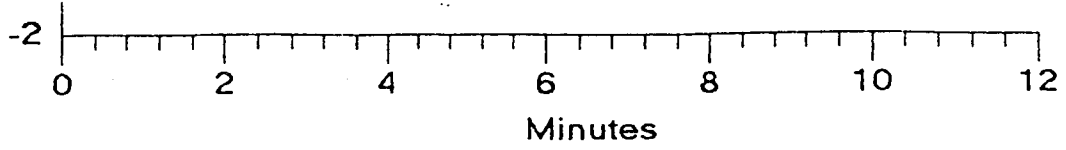
8.80	SULFATE	4.814	17703	393886	1	1.15
	Totals	34.321	247754	2665521		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169063.DXD Sample IPC - 802





le: \peaknet\schedule\11169901.sch
e 4.30 Page 2 of 2 11/17/99 3:02:20 AM

File :	C:\PEAKNET\DATA\11169064.DXD	Report Date:	11/17/99 3:16:03 AM
e Name:	LCS - B04	Collected :	11/17/99 3:03:55 AM
# :	64	Vial # :	B04
File:	c:\peaknet\method\acidscan.met	Calibrated :	11/16/99 1:51:23 PM
Name:	ANIONS	Detector :	CD20
Type:		Operator :	DK
Points:	3600	Rate :	5.00 Hz
Name:	S/N 96020568 ID:24 Of 15	Moduleware :	1.17

...tion	Volume	Dilution	Start	Stop	Area Reject	Pk. Width	Threshold
.1	50	1	0.00	12.00	10	10.00	0.94

type: Savitsky-Golay Size:5 points (1.0 sec) 1 iteration(s)

********** Component Report: All Components **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
[illegible]	FLUORIDE	10.054	204650	1585087	1	1.60
[illegible]	CHLORIDE	10.087	143700	1193218	2	1.11
[illegible]	NITRITE	9.879	63307	687469	2	1.38
[illegible]	BROMIDE	9.842	38777	469579	2	1.82
[illegible]	NITRATE	10.144	42078	621225	2	2.17
[illegible]	PHOSPHATE	10.240	14560	306310	1	1.16
	SULFATE	[illegible]	[illegible]	795791	1	0.96

********** Component Report: Components Found **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	10.054	204650	1585087	1	1.60
3.03	CHLORIDE	10.087	143700	1193218	2	1.11
3.67	NITRITE	9.879	63307	687469	2	1.38
4.67	BROMIDE	9.842	38777	469579	2	1.82
5.48	NITRATE	10.144	42078	621225	2	2.17
7.28	PHOSPHATE	10.240	14860	306310	1	1.16
8.78	SULFATE	9.608	36454	795791	1	0.96
	Totals	69.854	543826	5658679		

********** Peak Report: All Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
2.12	FLUORIDE	10.054	204650	1585087	1	1.60
3.03	CHLORIDE	10.087	143700	1193218	2	1.11
3.67	NITRITE	9.879	63307	687469	2	1.38
4.67	BROMIDE	9.842	38777	469579	2	1.82
5.48	NITRATE	10.144	42078	621225	2	2.17
7.28	PHOSPHATE	10.240	14860	306310	1	1.16

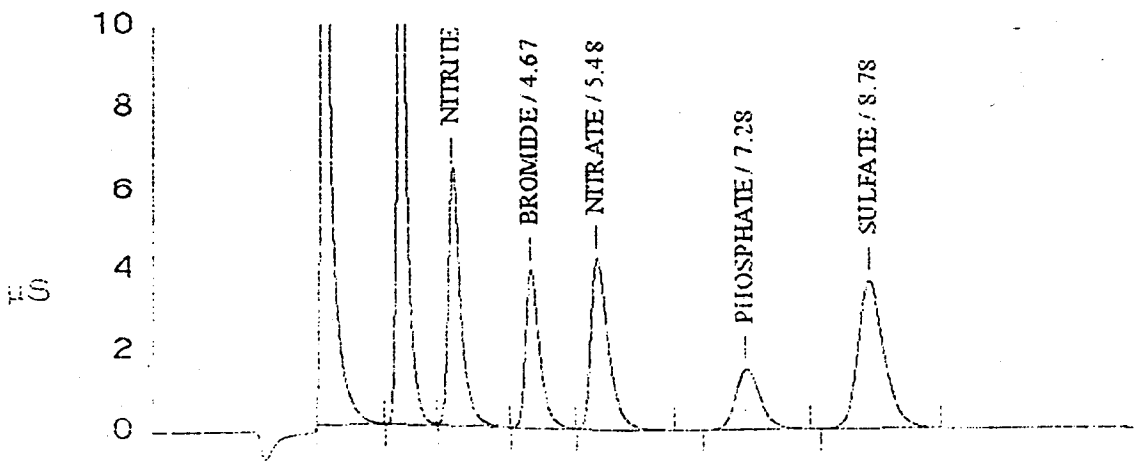
le: \peaknet\schedule\11169901.sch
e 4.30 Page 1 of 2 11/17/99 3:16:03 AM

8.78	SULFATE	9.608	36454	795791	1	0.96
	Totals	69.854	543826	5658679		

********** Peak Report: Unknown Peaks **********

Ret Time	Component Name	Concentration MG/L	Height	Area	Bl. Code	%Delta
	Totals	0.000	0	0		

File: 11169064.DXD Sample LCS - B04



SYNGAS SAMPLE ANALYTICAL REPORT

CORE LABORATORIES

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 994920
Prepared For:

TAMPA ELECTRIC
DAVID A SMITH
P O BOX 111
TAMPA, FL 33601-0111

Date: 11/11/99

Signature _____ Date: 11/11/99

Name: M. Jean Waits

CORE LABORATORIES
P O BOX 34766
HOUSTON, TX 77234-4282

Title: Supervising Chemist

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CORELAB

CORE LABORATORIES

LABORATORY TESTS RESULTS
11/11/99

JOB NUMBER: 994920 CUSTOMER: TAMPA ELECTRIC ATTN: DAVID A SMITH

CLIENT I.D.....:
DATE SAMPLED.....: 11/02/99
TIME SAMPLED.....: 08:23
WORK DESCRIPTION...: Clean Syngas Run 1

LABORATORY I.D...: 994920-0001
DATE RECEIVED....: 11/09/99
TIME RECEIVED....: 10:21
REMARKS.....: 1x300cc Cylinder

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis		*1		UOP-539	11/11/99	TSH
Hydrogen	36.76	0.10	Mol %			
Oxygen	1.13	0.01	Mol %			
Nitrogen	3.43	0.01	Mol %			
Carbon Monoxide	44.22	0.01	Mol %			
Carbon Dioxide	14.41	0.01	Mol %			
Hydrogen Sulfide	<0.01	0.01	Mol %			
Methane	0.05	0.01	Mol %			
Ethylene	<0.01	0.01	Mol %			
Ethane	<0.01	0.01	Mol %			
Propylene	<0.01	0.01	Mol %			
Propane	<0.01	0.01	Mol %			
Isobutane	<0.01	0.01	Mol %			
Isobutylene	<0.01	0.01	Mol %			
1-Butene	<0.01	0.01	Mol %			
n-Butane	<0.01	0.01	Mol %			
trans-2-Butene	<0.01	0.01	Mol %			
cis-2-Butene	<0.01	0.01	Mol %			
Isopentane	<0.01	0.01	Mol %			
n-Pentane	<0.01	0.01	Mol %			
Hexanes Plus	<0.01	0.01	Mol %			
Total	100.00	0.01	Mol %			
Molar Mass Ratio	0.71809	0				
Gross Heating Value (Dry)	261.5	0	BTU/CF (Ideal)			
Pressure Base	14.696	0	psia			

P O BOX 34766
HOUSTON, TX 77234-4282
(713) 943-9776

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgment of Core Laboratories. Core Laboratories, however, makes no warranty or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operations or profitableness of any oil, gas, coal or other mineral, property, well or sand in connection with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the written approval of Core Laboratories.

CORELAB

CORE LABORATORIES

LABORATORY TESTS RESULTS
11/11/99

JOB NUMBER: 994920 CUSTOMER: TAMPA ELECTRIC ATTN: DAVID A SMITH

CLIENT I.D.....:
DATE SAMPLED.....: 11/02/99
TIME SAMPLED.....: 13:08
WORK DESCRIPTION...: Clean Syngas Run 2

LABORATORY I.D...: 994920-0002
DATE RECEIVED....: 11/09/99
TIME RECEIVED....: 10:21
REMARKS.....: 1x300cc Cylinder

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis		*1		UOP-539	11/11/99	TSH
Hydrogen	36.67	0.10	Mol %			
Oxygen	1.14	0.01	Mol %			
Nitrogen	3.55	0.01	Mol %			
Carbon Monoxide	43.74	0.01	Mol %			
Carbon Dioxide	14.86	0.01	Mol %			
Hydrogen Sulfide	<0.01	0.01	Mol %			
Methane	0.04	0.01	Mol %			
Ethylene	<0.01	0.01	Mol %			
Ethane	<0.01	0.01	Mol %			
Propylene	<0.01	0.01	Mol %			
Propane	<0.01	0.01	Mol %			
Isobutane	<0.01	0.01	Mol %			
Isobutylene	<0.01	0.01	Mol %			
1-Butene	<0.01	0.01	Mol %			
n-Butane	<0.01	0.01	Mol %			
trans-2-Butene	<0.01	0.01	Mol %			
cis-2-Butene	<0.01	0.01	Mol %			
Isopentane	<0.01	0.01	Mol %			
n-Pentane	<0.01	0.01	Mol %			
Hexanes Plus	<0.01	0.01	Mol %			
Total	100.00	0.01	Mol %			
Molar Mass Ratio	0.72149	0				
Gross Heating Value (Dry)	259.5	0	BTU/CF (Ideal)			
Pressure Base	14.696	0	psia			

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CORE LABORATORIES

LABORATORY TESTS RESULTS
11/11/99

JOB NUMBER: 994920 CUSTOMER: TAMPA ELECTRIC ATTN: DAVID A SMITH

CLIENT I.D.....:
DATE SAMPLED.....: 11/02/99
TIME SAMPLED.....: 16:38
WORK DESCRIPTION...: Clean Syngas Run 3

LABORATORY I.D...: 994920-0003
DATE RECEIVED....: 11/09/99
TIME RECEIVED....: 10:21
REMARKS.....: 1x300cc Cylinder

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis		*1		UOP-539	11/11/99	TSH
Hydrogen	36.63	0.10	Mol %			
Oxygen	1.12	0.01	Mol %			
Nitrogen	3.58	0.01	Mol %			
Carbon Monoxide	44.39	0.01	Mol %			
Carbon Dioxide	14.22	0.01	Mol %			
Hydrogen Sulfide	<0.01	0.01	Mol %			
Methane	0.05	0.01	Mol %			
Ethylene	<0.01	0.01	Mol %			
Ethane	<0.01	0.01	Mol %			
Propylene	<0.01	0.01	Mol %			
Propane	<0.01	0.01	Mol %			
Isobutane	<0.01	0.01	Mol %			
Isobutylene	<0.01	0.01	Mol %			
1-Butene	<0.01	0.01	Mol %			
n-Butane	<0.01	0.01	Mol %			
trans-2-Butene	<0.01	0.01	Mol %			
cis-2-Butene	<0.01	0.01	Mol %			
Isopentane	<0.01	0.01	Mol %			
n-Pentane	<0.01	0.01	Mol %			
Hexanes Plus	0.01	0.01	Mol %			
Total	100.00	0.01	Mol %			
Molar Mass Ratio	0.71852	0				
Gross Heating Value (Dry)	262.0	0	BTU/CF (Ideal)			
Pressure Base	14.696	0	psia			

P O BOX 34766
HOUSTON, TX 77234-4282
(713) 943-9776

The analytical results, opinions or interpretations contained in this report are based upon information and material supplied by the client for whose exclusive and confidential use this report has been made. The analytical results, opinions or interpretations expressed represent the best judgment of Core Laboratories. Core Laboratories, however, makes no warranty or representation, express or implied, of any type, and expressly disclaims same as to the productivity, proper operations or profitableness of any oil, gas, coal or other mineral, property, well or sand in connection with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, in whole or in part, without the written approval of Core Laboratories.

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Page _____ of _____

Client Tampa Electric Co.
Est. Final Proj. Sampling Date 11/2/99
Work Order # _____
Project Contact/Phone # 610-701-7201
AD Project Manager Jeffrey O'Neill
QC Jack Mills Del _____ TAT _____
Date Rec'd _____ Date Due _____
Account # _____

Refrigerator #
#/Type Container — Liquid / Solid
Volume — Liquid / Solid
Preservatives

ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
1583	Clean Syngas R-1				11/2/99	0823
1581	Clean Syngas R-2				11/2/99	1308
1580	Clean Syngas R-3				11/2/99	1638

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
Jan Cross	[signature]	11/4/99	17:08
R. Webster	Ri Dorey	11/3/99	13:35

Relinquished by	Received by	Date	Time
[signature]	R. Webster	11/02/99	17:25
	A. Mollet	11-4-99	10:35

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# _____ 381-596a

ONTARIO HYDRO SAMPLES ANALYTICAL REPORT

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

December 22, 1999

Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Laboratory Project: 187901
Client Reference: Ontario Hydro Method/Tampa Electric, Polk

Dear Mr. O'Neill:

The samples which were logged in on 09-NOV-99 have been analyzed as requested. The analytical results are enclosed in the attached report.

Please note that any unused portion of the samples will be disposed after 22-DEC-99, unless you have requested otherwise.

Thank you for the opportunity to provide these services to you. If you have any questions concerning this report, please contact a Client Services representative at 610/921-8833.

Sincerely,

Fred Usbeck, CIH
Director, Laboratory Services

4418 POTTSVILLE PIKE, READING, PENNSYLVANIA 19605 610-921-8833 FAX 610-921-9667

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: Roy F. Weston, Inc.

Report to: Jeff O'Neill
Roy F. Weston, Inc.
One Weston Way
Bldg. 5-1
West Chester PA 19380

Project: 187901
Received: 08-NOV-99
Reported: 22-DEC-99

PURCHASE ORDER: 0008271

Project Description: Ontario Hydro Method/Tampa Electric, Polk

Sampled: 02-NOV-99

	RESULT	UNITS	METHOD	DATE	ANALYST
TECOPK-UNIT 1-STK-1-OHM-1NOV1999-FHHNO3/FILT (W-4)					
Lab Sample: 1382211					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
TECOPK-UNIT 1-STK-1-OHM-1NOV1999-BHKCL					
Lab Sample: 1382212					
Hg by Ont. Hydro Method, Draft	0.83	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
TECOPK-UNIT 1-STK-1-OHM-1NOV1999-BHHNO3					
Lab Sample: 1382213					
Hg by Ont. Hydro Method, Draft	< 0.19	ug/sample	Ont Hydro	22-NOV-99	JLP
TECOPK-UNIT 1-STK-1-OHM-1NOV1999-BHKMNO4					
Lab Sample: 1382214					
Hg by Ont. Hydro Method, Draft	7.56	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 7.56 ug					

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

Client: Roy F. Weston, Inc.
Project: 187901

	RESULT	UNITS	METHOD	DATE	ANALYST
TECOPK-UNIT 1-STK-2-OHM-1NOV1999-FHHNO3/FILT (W-5)					
Lab Sample: 1382215					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
TECOPK-UNIT 1-STK-2-OHM-1NOV1999-BHKCL					
Lab Sample: 1382216					
Hg by Ont. Hydro Method, Draft	0.64	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
TECOPK-UNIT 1-STK-2-OHM-1NOV1999-BHHNO3					
Lab Sample: 1382217					
Hg by Ont. Hydro Method, Draft	< 0.19	ug/sample	Ont Hydro	22-NOV-99	JLP
TECOPK-UNIT 1-STK-2-OHM-1NOV1999-BHKMNO4					
Lab Sample: 1382218					
Hg by Ont. Hydro Method, Draft	7.42	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 7.42 ug					
TECOPK-UNIT 1-STK-3-OHM-1NOV1999-FHHNO3/FILT (W-6)					
Lab Sample: 1382219					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					
TECOPK-UNIT 1-STK-3-OHM-1NOV1999-BHKCL					
Lab Sample: 1382220					
Hg by Ont. Hydro Method, Draft	0.27	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
TECOPK-UNIT 1-STK-3-OHM-1NOV1999-BHHNO3					
Lab Sample: 1382221					
Hg by Ont. Hydro Method, Draft	< 0.17	ug/sample	Ont Hydro	22-NOV-99	JLP

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

Client: Roy F. Weston, Inc.
Project: 187901

	RESULT	UNITS	METHOD	DATE	ANALYST
TECOPK-UNIT 1-STK-3-OHM-1NOV1999-BHKMNO4					
Lab Sample: 1382222					
Hg by Ont. Hydro Method, Draft	7.51	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = 7.51 ug					
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-KCL					
Lab Sample: 1382223					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-FILT					
Lab Sample: 1382224					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-KMNO4					
Lab Sample: 1382225					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-HNO3/H2O2					
Lab Sample: 1382226					
Hg by Ont. Hydro Method, Draft	< 0.21	ug/sample	Ont Hydro	22-NOV-99	JLP
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-HNO3					
Lab Sample: 1382227					
Hg by Ont. Hydro Method, Draft	< 0.046	ug/sample	Ont Hydro	22-NOV-99	JLP
Total Particle Bound Mercury = Hg Ash (ug) + Hg in Probe Rinse (ug)					
Total Particle Bound Mercury = < 0.046 ug					
TECOPK-UNIT 1-STK-BT-OHM-1NOV1999-FHHNO3/FILT					
Lab Sample: 1382228					
Hg by Ont. Hydro Method, Draft	< 0.02	ug/sample	Ont Hydro	30-NOV-99	JLP
Result represents Total Particle Bound Hg.					

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

Client: Roy F. Weston, Inc.
Project: 187901

	RESULT	UNITS	METHOD	DATE	ANALYST
TECOPK-UNIT 1-STK-BT-OHM-1NOV1999-BHKCL					
Lab Sample: 1382229					
Hg by Ont. Hydro Method, Draft	< 0.14	ug/sample	Ont Hydro	22-NOV-99	JLP
Result represents Oxidized Hg.					
TECOPK-UNIT 1-STK-BT-OHM-1NOV1999-BHHNO3					
Lab Sample: 1382230					
Hg by Ont. Hydro Method, Draft	< 0.19	ug/sample	Ont Hydro	22-NOV-99	JLP
TECOPK-UNIT 1-STK-BT-OHM-1NOV1999-BHKMNO4					
Lab Sample: 1382231					
Hg by Ont. Hydro Method, Draft	< 0.16	ug/sample	Ont Hydro	22-NOV-99	JLP
** Note **					
Total Elemental Mercury = HG in KMNO4 + HG in H2O2					
Total Elemental Mercury = < 0.19 ug					
TECOPK-UNIT 1-STK-SB-OHM-1NOV1999-10% HNO3					
Lab Sample: 1382232					
Hg by Ont. Hydro Method, Draft	< 0.04	ug/sample	Ont Hydro	22-NOV-99	JLP

< Indicates less than the limit of quantitation.

Lab Tracking Number

197901

Chain-of-Custody Record/Lab Work Request

WESTON

Client	TAMPA ELECTRIC, POLK		
Work Order Number	12281.001.001.0001	Phone Number	610-701-7201
Contact Person	Jeff ONeill	Turn Around Time	Standard

Lab ID	Field Sample ID	Sample Collection Date	Analysis	Post weight		Thimble ID #	Sample Check-off
			Analyses Requested/Other Info				
	TECOPK - UNIT 1 - STK - 1 - OHM - 1NOV1999 - FHHNO3	11/2/99	OHM				
	TECOPK - UNIT 1 - STK - 1 - OHM - 1NOV1999 - FILT		OHM	X		W-4	
	TECOPK - UNIT 1 - STK - 1 - OHM - 1NOV1999 - BHKCL		OHM				
	TECOPK - UNIT 1 - STK - 1 - OHM - 1NOV1999 - BHHNO3		OHM				
	TECOPK - UNIT 1 - STK - 1 - OHM - 1NOV1999 - BHKMNO4		OHM				
	TECOPK - UNIT 1 - STK - 2 - OHM - 1NOV1999 - FHHNO3		OHM				
	TECOPK - UNIT 1 - STK - 2 - OHM - 1NOV1999 - FILT		OHM	X		W-5	
	TECOPK - UNIT 1 - STK - 2 - OHM - 1NOV1999 - BHKCL		OHM				
	TECOPK - UNIT 1 - STK - 2 - OHM - 1NOV1999 - BHHNO3		OHM				
	TECOPK - UNIT 1 - STK - 2 - OHM - 1NOV1999 - BHKMNO4		OHM				
	TECOPK - UNIT 1 - STK - 3 - OHM - 1NOV1999 - FHHNO3		OHM				
	TECOPK - UNIT 1 - STK - 3 - OHM - 1NOV1999 - FILT		OHM	X		W-6	
	TECOPK - UNIT 1 - STK - 3 - OHM - 1NOV1999 - BHKCL		OHM				
	TECOPK - UNIT 1 - STK - 3 - OHM - 1NOV1999 - BHHNO3		OHM				
	TECOPK - UNIT 1 - STK - 3 - OHM - 1NOV1999 - BHKMNO4		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - KCl		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - FILT		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - KMNO4		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - HNO3/H2O		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - HNO3		OHM				
	TECOPK - UNIT 1 - STK - BT - OHM - 1NOV1999 - FHHNO3		OHM				
	TECOPK - UNIT 1 - STK - BT - OHM - 1NOV1999 - FILT		OHM				
	TECOPK - UNIT 1 - STK - BT - OHM - 1NOV1999 - BHKCL		OHM				
	TECOPK - UNIT 1 - STK - BT - OHM - 1NOV1999 - BHHNO3		OHM				
	TECOPK - UNIT 1 - STK - BT - OHM - 1NOV1999 - BHKMNO4		OHM				
	TECOPK - UNIT 1 - STK - SB - OHM - 1NOV1999 - 10% HNO3		OHM				

Notes: OHM - Speciated Mercury Analysis per Ontario Hydro Method

Post weight is for Mercury determination as per Ontario Hydro Method

Relinquished By	Received By	Date	Time	Lab Use Only	
Jake Mills	[illegible]	11/3/99		Shipper	Air Bill #
Joel Green	[illegible]	11/4/99	11:00	Opened By	Date/Time
Tyson Bellman	D. Baitell	11/8/99	11:05 AM	Temp °C	Condition
	J. Mast	11/8/99	11:30	Custody Seals: Yes No None N/A	

Laboratory Comments:

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187900-04
187901-04
188322-04
188323-04

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/30/99	Element: HG - Ontario Hydro method
Analyst: JHF	Time of Analysis: 1015
Data Validated by: V. O'Neill 12/2/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-30-5 to 10	10/29/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-30-12	11/29/99
IPC/CCV	360-30-11	11/29/99

- All samples analyzed in this set were either thimble portions or filters. The samples were digested as Ontario Hydro method (10/27/99 Draft States. The final volume was brought up to 0.100 L.

- Calculations:

$$\frac{\mu g}{L}_{Hg} \times 0.100\,L_{\text{final vol.}} = \mu g \text{ Hg present in sample}$$

D.L = 0.02 µg

- The Linear Dynamic Range for Hg is 25.0 µg/L.

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Jennifer L. Paris 12/1/99

Signature of Analyst and Date

```
RunProt: ONTARIO
RunFold: 113099UB Seq: 0     Batch:
                  Print: R/T On
                  Rev: 4.0     09:36:36 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                                 User:              A/S: On
```

AUTOSAMPLER: Pack entry Rack PACK#1 Range 1-44 Clear seQ Undo eXit

cup	ID	Extended id	Weight	Volume	Macro
1	GCS	11/29 5.00UG/L	1.0000	1.0000	
2	LRB-ASH	11/29 DIH2O	1.0000	1.0000	
3	LFB-ASH	11/29 DIH2O	1.0000	1.0000	
4	NIST	COAL FLY ASH #1633B	1.0000	1.0000	
5	1382194	INLET SB	1.0000	1.0000	
6	1382186	INLET SB	1.0000	1.0000	
7	1382224	STACK SB	1.0000	1.0000	
8	1382157	OUTLET #1	1.0000	1.0000	
9	1382161	OUTLET #2	1.0000	1.0000	
10	1382165	OUTLET #3	1.0000	1.0000	
11	1382169	OUTLET BT	1.0000	1.0000	
12	1382173	INLET #1	1.0000	1.0000	
13	1382177	INLET #2	1.0000	1.0000	
14	1382177	INLET #2	1.0000	1.0000	
15	1382177 MS	INLET #2	1.0000	1.0000	

PgDn

Full column entry Ins to switch

```
RunProt: ONTARIO
RunFold: 113099HB Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:36:37 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
 AUTOSAMPLER:  Rack entry   Rack RACK#1   Range  1-44 Clear seQ Undo eXit   PgUp
cup ID          Extended id          Weight Volume Macro
16 1382181      INLET #3             1.0000 1.0000
17 1382190      INLET BT             1.0000 1.0000
18 1382211      STACK #1             1.0000 1.0000
19 1382215      STACK #2             1.0000 1.0000
20 1382219      STACK #3             1.0000 1.0000
21 1382228      STACK BT             1.0000 1.0000
22 LFB-ASH      11/29 FILTERS/THIMB.1.0000 1.0000
23 LFB-ASH      11/29 FILTERS/THIMB.1.0000 1.0000
24 NIST         COAL FLY ASH #1633B 1.0000 1.0000
25 1384089      FGD-1 INLET          1.0000 1.0000
26 1384089      FGD-1 INLET          1.0000 1.0000
27 1384089 MB   FGD-1 INLET          1.0000 1.0000
28 1384095      FGD-2 INLET          1.0000 1.0000
29 1384101      FGD-3 INLET          1.0000 1.0000
30 1384107      FGD-BT INLET         1.0000 1.0000
                                                                          PgDn
```

```
                                                  Full column entry Ins to switch
```

RunProt: ONTARIO
RunFold: 113099HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 09:36:40 30 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle User: A/S: On

AUTOSAMPLER: Rack entry Rack RACK#1 Range 1-44 Clear seQ Undo eXit PgUp

cup	ID	Extended id	Weight	Volume	Macro
31	1384138	BH OUT SB	1.0000	1.0000	
32	1384128	BH OUT SB	1.0000	1.0000	
33	1384113	BH #1	1.0000	1.0000	
34	1384118	BH #2	1.0000	1.0000	
35	1384123	BH #3	1.0000	1.0000	
36	1384133	BH BT	1.0000	1.0000	
37	ESP.STACK	SB THIMBLE	1.0000	1.0000	
38	ESP.STACK	SB THIMBLE	1.0000	1.0000	
39	ESP.STACK	SB THIMBLE MS	1.0000	1.0000	
40	ESP INLET	SB FILTER	1.0000	1.0000	
41	1384167	ESFO#1	1.0000	1.0000	
42	1384172	ESFO#2	1.0000	1.0000	
43	1384177	ESFO#3	1.0000	1.0000	
44	1384182	ESFO~~#4~~ 14.49 90 BT	1.0000	1.0000	

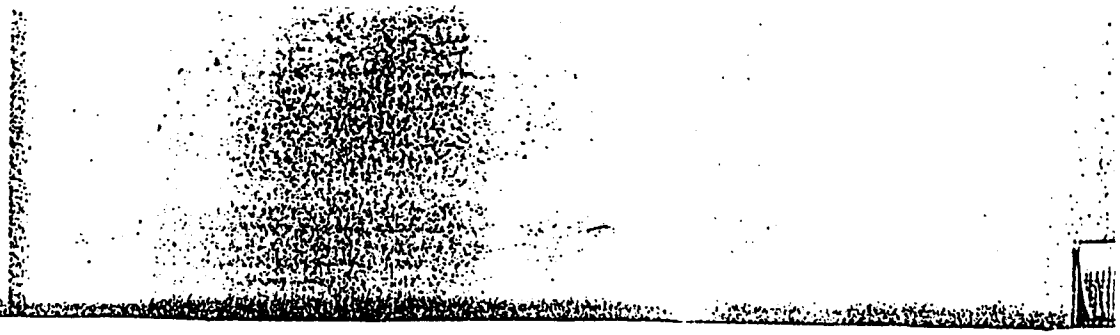
1384160

PgDn

Full column entry Ins to switch

Reagents, QC, Standards Preparation Log #360

	Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents #	Vol/Wt of Reagents Units	Reagent SSM ID #	Reagent SSM ID # Conc.	Final Volume #	Final Volume Units	Dilution Matrix	Remarks
1)	11/23/99 1330	SMW		IPC/CCV 5.0ug/l	500	ul	360-29-18	1.00 mg/l	100	ml		
2)	↓	↓		ICV/QCS 5.0ug/l	↓	↓	360-29-19	↓	↓	↓		
3)	11/29/99 0900	GH	11/30/99	1.00 mg/l Hg stock std	100	ul	Hg-995118501 9	1000 mg/l	100	ml	0.15% HNO3	
4)	↓	↓	↓	1.00 mg/l Hg QCS std	100	↓	Hg-995123001	↓	↓	↓	↓	
5)	11/29/99 1300	SMW		Cal Blk	—	—	—	—	100	ml	10% HCl	Ontario Method
6)				0.20ug/l Hg Std	20	ul	360-30-3	1.00 mg/l				
7)				0.50	50							
8)				2.00	200							
9)				5.00	500							
10)				10.0	1000							
11)				IPC/CCV ~~2.0~~ 5.0 ug/l	500							
12)				ICV/QCS 5.0ug/l	500	↓	360-30-4	↓	↓	↓	↓	↓
13)												
14)												
15)												
16)												
17)												
18)												
19)												
20)												
21)												
22)												
23)												
24)												
25)												



Book #118

Ontario Hydro Method (10/27/10 Draft)

187701

187700

Analyst, 0.0 + 15 min	Sample ID	Initial sample mass (g)	Final vol. (L) and sample mass up to (g)	Vol. of 1 mol/L H_2SO_4 (mL)	Vol. of 1 mol/L NaOH (mL)	Vol. of 1 mol/L H_2SO_4 (mL)	Vol. of 5% KMnO4 (mL)	Vol. of 1 mol/L HCl (mL)	Vol. of 1 mol/L NaOH (mL)	Vol. of 5% KMnO4 (mL)	Vol. of 10% H_2O_2 (mL)
"/19/11 GHP 1320	1382166	0.750 L	0.750 L	30 mL	1.5 mL	0.75 mL	4.5 mL	—	2.25 mL	3.0 mL	
	2170	0.480 L	0.500 L								
	2174	0.950 L	0.950 L								
	2178	0.900 L	0.900 L								
	2182	0.840 L	0.840 L								
	2191	0.550 L	0.550 L								
	2212	0.695 L	0.695 L								
	2216	0.787 L	0.787 L								
	2220	0.800 L	0.800 L								
	2229	0.480 L	0.500 L								
"/22/11 0710 GHP	LRB-KMnO4	—	—	30 mL	—	1.5 mL	4.5 mL	—	2.25 mL	3.0 mL	
	LFB-KMnO4 clear ml	—	—				4.5 mL				
	1382225	0.250 L	0.500 L				4.5 mL				
	1382167 client blk	0.350 L					4.5 mL				
	1382160	0.480 L					4.5 mL				
	2164	0.515 L	0.515 L				4.5 mL				
	2168	0.600 L	0.600 L				4.5 mL				
	2172	0.495 L	0.500 L				4.5 mL				
	2176	0.470 L					4.5 mL				
	2180	0.480 L					5.0 mL				
	2184	0.490 L					7.5 mL				
	2193	0.514 L	0.514				4.5 mL				
	2214	0.430 L	0.500				4.5 mL				
	2218	0.435 L	0.500 L				4.5 mL				
	2222	0.530 L	0.530 L				4.5 mL				
	2231	0.430 L	0.500 L				10.5 mL				
"/19/11 0720 GHP	XBB-Ash	—	0.100 L	30 mL	—	1.25 mL	—	3.75 mL	—	—	
	XFB-Ash Next-Monthly Blk-Xi#4338	—	0.100 L	0.50 g			—		—	—	
	1382194	3.0906 g		small filter			—		—	—	
	1382186	0.3906 g		filter blank			—		—	—	
	1382224	3.2878 g		filter blank			—		—	—	
	1382157	0.3965 g		filter			—		—	—	
	1382161	0.3928 g					—		—	—	
	1382165	0.3973 g					—		—	—	
	1382169	0.3990 g					—		—	—	
	1382173	3.0145 g		filter blank			—		—	—	
	1382177	3.2823 g					—		—	—	
	1382181	3.1983 g					—		—	—	
	1382190	3.1694 g					—		—	—	

Comments	Sample ID.	Initial sample wt. (grams)	Final sample wt. (grams)	Total Vol. of Sample Aliquot (mL)	Vol. of 1mL Trace Metal HNO3 (mL)	Vol. of 1mL Trace Metal HNO3 (mL)	50% KMnO4 (mL)	Vol. of HCl (mL)	Vol. of 30% H2O2 (mL)	Vol. of HCl aliquot (mL)	
Shake #1	138221	3.4387g	0.100 mL	whole thimble	—	1.35mL	—	3.75mL	—	—	
Shake #2	138225	3.6549g			—		—		—	—	
Shake #3	138229	3.2602g			—		—		—	—	
Shake BF	138228	3.5245g			—		—		—	—	
—	LRB-HNO3 filtered/thimble	N/A		-	—		—		—	—	
—	LF13-HNO3 filtered/thimble			-	—		—		—	—	
—	LCS-Cert. Aq. Lot #6133 filter			0.32g 0.50g	—		—		—	—	
FGD-1 Inlet	1384089 filter			whole filter	—		—		—	—	
FGD-2 Inlet	1384095 2 filters			2 filters	—		—		—	—	
FGD-3 Inlet	1384101 filter			whole filter	—		—		—	—	
FGD-BF Inlet	1384107 thimble				—		—		—	—	
Kiln Inlet SB	1384138 thimble			whole thimble	—		—		—	—	
BH out SB	1384128 filter			whole filter	—		—		—	—	
BH #1	1384113 filter				—		—		—	—	
BH #2	1384118 filter				—		—		—	—	
BH #3	1384123 filter				—		—		—	—	
BH BF	1384133 thimble				—		—		—	—	
ESP Inlet SB	ESP. Inlet - SB 1384160 filter			whole thimble	—		—		—	—	
ESP Inlet #3	ESP - Inlet - #3 1384167 filter			whole filter	—		—		—	—	
ESP #1	1384172 filter				—		—		—	—	
ESP #2	1384177 filter				—		—		—	—	
ESP #3											
ESP BF	1384182				—		—		—	—	

Notes: Samples & QC prepared on 11/29/99 were placed in a 95°C water bath for 8 hours. After cooling, 3.5g of boric acid was added. gjh

1382157 Sample wt. = 0.3965g

1382173 Sample wt. = 3.0145g W-1 ← wt. = 0.0538g

1382165 Sample wt. = 0.3973

1382186 Sample wt = 0.3908

1382190 Sample wt. = 3.1694

1382177 Sample wt = 3.2812 W-3 ← wt. = 0.0535g

1382224 Sample wt = 3.2878

1382161 Sample wt. = 0.3928

1382211 Sample wt = 3.4387 W-4 ← wt. = .0014g

1382219 Sample wt = 3.2602 W-6 ← wt. = .0023g

1382194 Sample wt = 3.0906

1382169 Sample wt = 0.3790

1382215 Sample wt. = 3.6599 W-5 ← wt. = .0028g

1382181 Sample wt. = 3.3983 W-2 ← wt. = 0.0356g

1382228 Sample wt. = 3.5245

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0     Batch:
                  Prnt: R/T On
                  Rev: 4.0     09:38:15 30 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                              User:                A/S: On
```

```
UTILITY:  Diagnostics   Tip X      0 1   22
Aper test               Tip Y      0 1    1
Test optic              Tip Z     95 1    0
Tip home                Gas      322
Out port
In port
Run pcode
Cal A/S
```

aperture 21

acceptable Range = -100 to +100

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 344
```

```
RunProt: ONTARIO
RunFold: 113099HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    09:38:23 30 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                             User:              A/S: On
```

```
UTILITY:  Diagnostics   Tip X      0 1   22
Aper test               Tip Y      0 1    1
Test optic              Tip Z     95 1    0
Tip home                Gas      322
Out port                                          Smpl. intensity    1104637 } <10%
In port                                           Ref. intensity     1103677 } diffe
Run scode
Cal A/S
```

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 142
```

RunProt: ONTARIO
RunFold: 113099NB Seq: 0 Batch:
Prnt: P/T On
Rev: 4.0 09:38:48 10 Nov 1999 Xmit: Off Bal: 1.79 LPM
Idle User: A/D: On

INSTRUMENT: Scheduled maintenance

		Uses left	Last service	Next service
replace:	Pump tubing	600	29-Nov-99	09-Dec-99
	Waste drain tubing	1748	12-Nov-99	27-Oct-00
	Liquid/gas separator	959	07-Sep-99	11-Oct-00
	pump head	10000	N/A	N/A
	Hg lamp	N/A	30-Aug-99	27-Jan-00
	Reductant bottle	16	22-Nov-99	20-May-00
	prOcess tuning	959	N/A	N/A
Clean optical cell		600	N/A	N/A

* - needs maintenance

For help on <hotkey> press Shift <hotkey>

RunFold: 113099HG Sec: 152 Batch:
Prnt: R/T On
Rev: 4.0 15:48:48 30 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle User: A/S: On

INSTRUMENT: Scheduled Maintenance

		Uses left	Last service	Next service
replace:	Pump tubing	447	29-Nov-99	09-Dec-99
	Waste drain tubing	1595	12-Nov-99	27-Oct-00
	Liquid/gas separator	006	07-Sep-99	11-Oct-00
	pump head	10000	N/A	N/A
	Hg lamp	N/A	30-Aug-99	27-Jan-00
	Reductant bottle	400	30-Nov-99	29-Mar-00
	prOcess tubing	006	N/A	N/A
Clean optical cell		600	N/A	N/A

* = needs maintenance

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 1 Rep: 1				Sec: 3		10:04:25 30 Nov 1999 HG		
Hg	.000	ug/l	269					
*** Standard: 1 Rep: 1				Sec: 4		10:15:14 30 Nov 1999 HG		
Hg	.000	ug/l	-49					
*** Standard: 1 Rep: 2				Sec: 5		10:17:04 30 Nov 1999 HG		
Hg	.000	ug/l	450					
*** Standard: 2 Rep: 1				Sec: 6		10:19:37 30 Nov 1999 HG		
Hg	.200	ug/l	19965					
*** Standard: 2 Rep: 2				Sec: 7		10:21:46 30 Nov 1999 HG		
Hg	.200	ug/l	19457					
*** Standard: 3 Rep: 1				Sec: 8		10:23:57 30 Nov 1999 HG		
Hg	.500	ug/l	49954					
*** Standard: 3 Rep: 2				Sec: 9		10:26:07 30 Nov 1999 HG		
Hg	.500	ug/l	49633					
*** Standard: 4 Rep: 1				Sec: 10		10:28:17 30 Nov 1999 HG		
Hg	2.00	ug/l	204603					
*** Standard: 4 Rep: 2				Sec: 11		10:30:31 30 Nov 1999 HG		
Hg	2.00	ug/l	203494					
*** Standard: 5 Rep: 1				Sec: 12		10:32:44 30 Nov 1999 HG		
Hg	5.00	ug/l	504535					
*** Standard: 5 Rep: 2				Sec: 13		10:35:08 30 Nov 1999 HG		
Hg	5.00	ug/l	509013					
*** Standard: 6 Rep: 1				Sec: 14		10:37:22 30 Nov 1999 HG		
Hg	10.0	ug/l	906805					

11/30/99 gc

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

*** Standard: 6 Rep: 1 Seq: 15 10:40:02 30 Nov 1999 HG

Hg 10.0 ug/l 990073

RunProt: ONTARIO

RunFold: 113099MG Seq: 16 Batch:

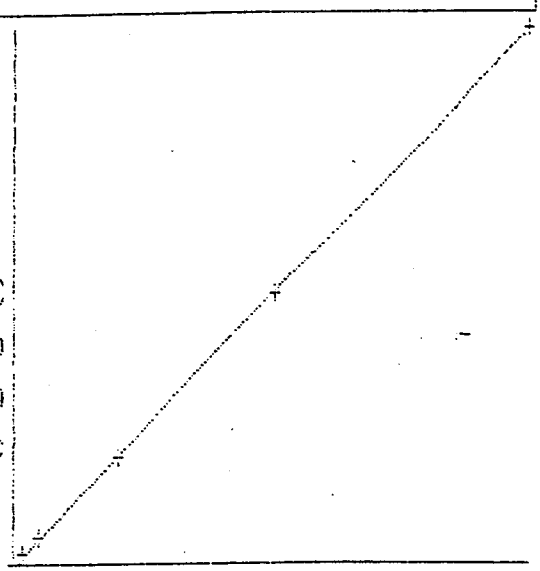
Prnt: R/T On

Rev: 4.8 10:48:18 30 Nov 1999 Xmit: Off Gas: 0.30 LPM

Idle User: A/S: On

CALIBRATION: Line proto: ONTARIO

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.017	-.017	Quadratic
S2	.200	.174	-.026	Wtdlinear
S3	.500	.481	-.019	C
S4	2.00	2.03	.029	Accept
S5	5.00	5.08	.077	n
S6	10.0	9.96	-.044	c
A	.0000000	r	.999935	
B	1.86511e-5	C	-1.92614e-2	



Relative Absorbance

	Mean	%RSD		
S1	200	175.98	-49	458
S2	19221	1.74	18985	19457
S3	49818	0.38	49954	49683
S4	203748	0.18	204003	203494
S5	507034	0.69	504555	509513
S6	992479	0.8	986885	998073

New cal coefficients stored

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

*** Check Standard: 4 CK4IPC/CCV Seq: 16 10:42:20 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.11	5.00	ug/l	.000

$\bar{x}$ = 5.09 ug/l (102%)

*** Check Standard: 3 CK3IPC/CCV Seq: 17 10:45:48 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	5.07	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 18 10:48:10 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-33400	-.032	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 19 10:50:16 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.021	.200	ug/l	.000

*** Sample ID: QCS Seq: 20 10:52:22 30 Nov 1999 HG

11/29 5.00UG/L

Hg	5.00	ug/l	.000	5.00	

$\bar{x}$ = 5.00 ug/l (100%)

*** Sample ID: QCS Seq: 21 10:54:47 30 Nov 1999 HG

11/29 5.00UG/L

Hg	5.00	ug/l	.000	5.00	

*** Sample ID: LRB-ASH Seq: 22 10:57:11 30 Nov 1999 HG

11/29 DIH2O

Hg	<0.2 .031	ug/l	.000	.031	

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: LRB-ASH Seq: 23 10:59:15 30 Nov 1999 HG

11/29 DIH2O

Hg	<0.2 .037	ug/l	.000	.037	

*** Sample ID: LFT-ASH Seq: 24 11:01:20 30 Nov 1999 HG

11/29 DIH2O

Hg	2.01	ug/l	.000	2.01	

LFB T.V. = 2.00 ug/l x 0.100 l = 0.200 ug

$\bar{x}$ = 2.03 ug/l x 0.100 l = 0.203 ug (101%)

*** Sample ID: LFB-ASH Seq: 25 11:03:36 30 Nov 1999 HG

11/29 DIH2O

Hg	2.04	ug/l	.000	2.04	

*** Sample ID: NIST Seq: 26 11:05:57 30 Nov 1999 HG

COAL FLY ASH #1633B

Hg	.750	ug/l	.000	.750	

T.V. = 0.141 ± 0.019 ug/g

$\bar{x}$ = 0.749 ug/l x $\frac{0.100\,l}{0.50\,g}$ = 0.150 ug/g

*** Sample ID: NIST Seq: 27 11:07:58 30 Nov 1999 HG

COAL FLY ASH #1633B

Hg	.747	ug/l	.000	.747	

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

*** Sample ID: 1382194 Seq: 28 11:10:03 30 Nov 1999 HG

	<0.2		INLET SB	
Hg	.130	ug/l	.000	.130

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382194 Seq: 29 11:12:07 30 Nov 1999 HG

	<0.2		INLET SB	
Hg	.135	ug/l	.000	.135

*** Check Standard: 4 Ck4IPC/CCV Seq: 30 11:14:13 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		104.	5.18	5.00	ug/l	.000

$\bar{x}$ = 5.15 ug/l 104 %.e

*** Check Standard: 3 Ck3IPC/CCV Seq: 31 11:16:30 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		103.	5.13	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 32 11:18:52 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-28300	-.028	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 33 11:20:58 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.023	.200	ug/l	.000

*** Sample ID: 1382186 Seq: 34 11:23:04 30 Nov 1999 HG

	<0.2		INLET SB	
Hg	.081	ug/l	.000	.081

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382186 Seq: 35 11:25:08 30 Nov 1999 HG

	<0.2		INLET SB	
Hg	.079	ug/l	.000	.079

*** Sample ID: 1382224 Seq: 36 11:27:13 30 Nov 1999 HG

	<0.2		STACK SB	
Hg	.099	ug/l	.000	.099

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382224 Seq: 37 11:29:19 30 Nov 1999 HG

	<0.2		STACK SB	
Hg	.100	ug/l	.000	.100

*** Sample ID: 1382157 Seq: 38 11:31:24 30 Nov 1999 HG

	<0.2		OUTLET #1	
Hg	.051	ug/l	.000	.051

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382157 Seq: 39 11:33:29 30 Nov 1999 HG

	<0.2		OUTLET #1	
Hg	.049	ug/l	.000	.049

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382161				Seq: 40	11:35:33 30 Nov 1999 HG			
	<0.2			OUTLET #2				
Hg	.052	ug/l		.000	.052			
*** Sample ID: 1382161				Seq: 41	11:37:39 30 Nov 1999 HG			
	<0.2			OUTLET #2				
Hg	.054	ug/l		.000	.054			
*** Sample ID: 1382165				Seq: 42	11:39:44 30 Nov 1999 HG			
	<0.2			OUTLET #3				
Hg	.019	ug/l		.000	.019			
*** Sample ID: 1382165				Seq: 43	11:41:50 30 Nov 1999 HG			
	<0.2			OUTLET #3				
Hg	.020	ug/l		.000	.020			
*** Check Standard: 4 Ck4IPC/CCV				Seq: 44	11:43:55 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		92.1	4.60	5.00	ug/l	.000		
*** Check Standard: 3 Ck3IPC/CCV				Seq: 45	11:46:40 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		97.8	4.89	5.00	ug/l	.000		
*** Check Standard: 2 Ck2ICB/CCB				Seq: 46	11:48:57 30 Nov 1999 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		-33200	-.033	.000	ug/l	.000		
*** Check Standard: 1 Ck1ICB/CCB				Seq: 47	11:51:03 30 Nov 1999 HG			
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.004	.200	ug/l	.000			
*** Sample ID: 1382169				Seq: 48	11:53:09 30 Nov 1999 HG			
	<0.2			OUTLET BT				
Hg	.016	ug/l		.000	.016			
*** Sample ID: 1382169				Seq: 49	11:55:15 30 Nov 1999 HG			
	<0.2			OUTLET BT				
Hg	.019	ug/l		.000	.019			
*** Sample ID: 1382173				Seq: 50	11:57:19 30 Nov 1999 HG			
	<0.2			INLET #1				
Hg	.096	ug/l		.000	.096			
*** Sample ID: 1382173				Seq: 51	11:59:25 30 Nov 1999 HG			
	<0.2			INLET #1				
Hg	.074	ug/l		.000	.074			

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = 4.75 ug/l (95%)

6% difference

$\bar{x}$ = <0.2 ug/l

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

$\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

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

*** Sample ID: 1382177 Seq: 52 12:01:26 30 Nov 1999 HG
INLET #2
Hg .149 ug/l .000 .149 $\bar{x}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1382177 Seq: 53 12:03:32 30 Nov 1999 HG
INLET #2
Hg .151 ug/l .000 .151

*** Sample ID: 1382177 Seq: 54 12:05:34 30 Nov 1999 HG
INLET #2
Hg .136 ug/l .000 .136

*** Sample ID: 1382177 Seq: 55 12:07:39 30 Nov 1999 HG
11/30/99 JP
INLET #2
Hg .132 ug/l .000 .132

*** Sample ID: 1382177 MS Matrix Spk Seq: 56 12:09:46 30 Nov 1999 HG
INLET #2
Hg 1.96 ug/l .000 1.96 Matrix Spk T.V.: 2.00ug/l x 0.100l = 0.200ug
$\bar{x}$ = 1.94ug/l x 0.100l = 0.194ug 97%R

*** Sample ID: 1382177 MS Seq: 57 12:11:59 30 Nov 1999 HG
INLET #2
Hg 1.93 ug/l .000 1.93

*** Check Standard: 4 Ck4ICB/CCV Seq: 58 12:14:15 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 94.8 4.74 ✓ 5.00 ✓ ug/l .000 $\bar{x}$ = 4.83ug/l 97%R 6% different

*** Check Standard: 3 Ck3ICB/CCV Seq: 59 12:16:43 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.1 4.91 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 60 12:19:07 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -2700 -.020 ✓ .000 ug/l .000 $\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 61 12:21:14 30 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.022 ✓ .200 ug/l .00%

*** Sample ID: 1382181 Seq: 62 12:23:20 30 Nov 1999 HG
INLET #2
Hg .041 ug/l .000 .041 $\bar{x}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1382181 Seq: 63 12:25:22 30 Nov 1999 HG
INLET #2
Hg .043 ug/l .000 .043

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

*** Sample ID: 1382190 Seq: 64 12:27:29 30 Nov 1999 HG

<0.2 INLET BT

Hg .071 ug/l .000 .071 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382190 Seq: 65 12:29:33 30 Nov 1999 HG

<0.2 INLET BT

Hg .068 ug/l .000 .068

*** Sample ID: 1382211 Seq: 66 12:31:37 30 Nov 1999 HG

<0.2 STACK #1

Hg .048 ug/l .000 .048 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 ug

*** Sample ID: 1382211 Seq: 67 12:33:41 30 Nov 1999 HG

<0.2 STACK #1

Hg .052 ug/l .000 .052

*** Sample ID: 1382215 Seq: 68 12:35:46 30 Nov 1999 HG

<0.2 STACK #2

Hg .176 ug/l .000 .176 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02

*** Sample ID: 1382215 Seq: 69 12:37:50 30 Nov 1999 HG

<0.2 STACK #2

Hg .176 ug/l .000 .176

*** Sample ID: 1382219 Seq: 70 12:39:55 30 Nov 1999 HG

<0.2 STACK #3

Hg .067 ug/l .000 .067 $\bar{x}$ = <0.2 ug/l x 0.100 l = <0.02 u

*** Sample ID: 1382219 Seq: 71 12:42:00 30 Nov 1999 HG

<0.2 STACK #3

Hg .066 ug/l .000 .066

*** Check Standard: 4 CK4IPC/CCV Seq: 72 12:44:06 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.6	4.98 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.95 ug/l 99 %l

(recirc in IPC into cup)

*** Check Standard: 3 CK3IPC/CCV Seq: 73 12:46:28 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	4.93 ✓	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 74 12:48:47 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-29200	-.029	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 75 12:50:54 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		.02	[illegible]	ug/l	.00

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

*** Sample ID: 1382228 Seq: 71 12:53:00 30 Nov 1999 HG
<0.2 STACK BT
Hg .064 ug/l .000 .064 $\bar{x}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1382228 Seq: 77 12:55:05 30 Nov 1999 HG
<0.2 STACK BT
Hg .063 ug/l .000 .063

*** Sample ID: LRB-ASH For PJ# 188323 + 188322 Seq: 78 12:57:12 30 Nov 1999 HG
<0.2 11/29 FILTERS/THIMB.
Hg .024 ug/l .000 .024 $\bar{x}$ = <0.2ug/l x 0.100l = <0.02u

*** Sample ID: LRB-ASH Seq: 79 12:59:18 30 Nov 1999 HG
<0.2 11/29 FILTERS/THIMB.
Hg .025 ug/l .000 .025

*** Sample ID: LFB-ASH Seq: 80 13:01:23 30 Nov 1999 HG
11/29 FILTERS/THIMB. LFB T.V. = 2.00ug/l x 0.100l = 0.200ug
Hg 1.97 ug/l .000 1.97 $\bar{x}$ = 1.98ug/l x 0.100l = 0.198ug 99%R

*** Sample ID: LFB-ASH Seq: 81 13:03:40 30 Nov 1999 HG
11/29 FILTERS/THIMB.
Hg 1.98 ug/l .000 1.98

*** Sample ID: NIST Seq: 82 13:05:55 30 Nov 1999 HG
COAL FLY ASH #1633B T.V. = 0.141ug/g ± 0.019ug/g
Hg .847 ug/l .000 .847 $\bar{x}$ = 0.850ug/l x 0.100l / 0.500g = 0.163ug/g

11/29/99 gf

*** Sample ID: NIST Seq: 83 13:08:00 30 Nov 1999 HG
COAL FLY ASH #1633B
Hg .853 ug/l .000 .853

*** Sample ID: 1384089 Seq: 84 13:10:06 30 Nov 1999 HG
<0.2 FED-1 INLET
Hg .063 ug/l .000 .063 $\bar{x}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1384089 Seq: 85 13:12:11 30 Nov 1999 HG
<0.2 FED-1 INLET
Hg .059 ug/l .000 .059

*** Check Standard: 4 CK4IPC/CCV Seq: 86 13:1[illegible]:19 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg [illegible] 4.91 ✓ 5.00 ug/l .000 $\bar{x}$ = 4.91ug/l 98%R

*** Check Standard: 3 CK3IPC/CCV Seq: 87 13:1[illegible] 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg [illegible] 4.90 ✓ 5.00 ug/l .000

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

*** Check Standard: 2 CK2ICB/CCB Seq: 88 13:19:01 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-30200	-.030	.000	ug/l	.000

$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 89 13:21:08 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.024	.200	ug/l	.000

*** Sample ID: 1384089 Seq: 90 13:23:15 30 Nov 1999 HG

	<0.2		FGD-1 INLET	
Hg	.021	ug/l	.000	.021

$\bar{x}$ = <0.2ug/l x 0.100 = <0.02ug

*** Sample ID: 1384089 Seq: 91 13:25:20 30 Nov 1999 HG

	<0.2		FGD-1 INLET	
Hg	.023	ug/l	.000	.023

*** Sample ID: 1384089 MS matrix Spk Seq: 92 13:27:25 30 Nov 1999 HG

			FGD-1 INLET	
Hg	1.90	ug/l	.000	1.90

matrix Spk T.V. = 2.00ug/l x 0.100l = 0.200ug

$\bar{x}$ = 1.88ug/l x 0.100l = 0.188ug 94%

*** Sample ID: 1384089 MS Seq: 93 13:29:36 30 Nov 1999 HG

			FGD-1 INLET	
Hg	1.87	ug/l	.000	1.87

*** Sample ID: 1384095 Seq: 94 13:31:46 30 Nov 1999 HG

			FGD-2 INLET	
Hg	1.19	ug/l	.000	1.19

$\bar{x}$ = 1.20ug/l x 0.100l = 0.120ug

Data was confirmed on pg. #602)

*** Sample ID: 1384095 Seq: 95 13:33:54 30 Nov 1999 HG

			FGD-2 INLET	
Hg	1.21	ug/l	.000	1.21

*** Sample ID: 1384101 Seq: 96 13:36:02 30 Nov 1999 HG

	<0.2		FGD-3 INLET	
Hg	.015	ug/l	.000	.015

$\bar{x}$ = <0.2ug/l x 0.100l = <0.02ug

*** Sample ID: 1384101 Seq: 97 13:38:08 30 Nov 1999 HG

	<0.2		FGD-3 INLET	
Hg	.018	ug/l	.000	.018

*** Sample ID: 1384107 Seq: 98 13:40:13 30 Nov 1999 HG

	<0.2		FGD-BT INLET	
Hg	.111	ug/l	.000	.111

$\bar{x}$ = <0.2ug/l x 0.100l = <0.02

*** Sample ID: 1384107 Seq: 99 13:42:20 30 Nov 1999 HG

	<0.2		FGD-BT INLET	
Hg	.109	ug/l	.000	.109

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

*** Check Standard: 4 CK4IPC/CCV Seq: 100 13:44:27 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 101. 5.05 5.00 ug/l .000
$\bar{x}$ = 4.98 ug/l (100 2.9)

*** Check Standard: 3 CK3IPC/CCV Seq: 101 13:46:47 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 99.6 4.98 5.00 ug/l .000

*** Check Standard: 2 CK2ICB/CCB Seq: 102 13:49:07 30 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg [illegible] -.029 ✓ .000 ug/l .000
$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 103 13:51:14 30 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.015 ✓ .300 ug/l .000

*** Sample ID: 1384135 Seq: 104 13:53:19 30 Nov 1999 HG
BH OUT SB
Hg <0.2 .047 ug/l .000 .047
$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384136 Seq: 105 13:55:25 30 Nov 1999 HG
BH OUT SB
Hg <0.2 .047 ug/l .000 .047

*** Sample ID: 1384137 Seq: 106 13:57:31 30 Nov 1999 HG
BH OUT SB
Hg <0.2 .106 ug/l .000 .106
$\bar{x}$ = <0.2 ug/l × 0.100 l = <0.02 ug

*** Sample ID: 1384138 Seq: 107 13:59:37 30 Nov 1999 HG
BH OUT SB
Hg <0.2 .111 ug/l .000 .111

*** Sample ID: 1384113 Seq: 108 14:01:43 30 Nov 1999 HG
BH #1
Hg .218 ug/l .000 .218
$\bar{x}$ = 0.218 ug/l × 0.100 l = 0.0218 ug

*** Sample ID: 1384113 Seq: 109 14:03:48 30 Nov 1999 HG
BH #1
Hg .217 ug/l .000 .217

*** Sample ID: 1384114 Seq: 110 14:05:55 30 Nov 1999 HG
BH #2
Hg .233 ug/l .000 .233
$\bar{x}$ = 0.234 ug/l × 0.100 l = 0.0234 ug

*** Sample ID: 1384115 Seq: 111 14:08:01 30 Nov 1999 HG
BH #2
Hg .236 ug/l .000 .236

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

*** Sample ID: 1384123 Seq: 112 14:10:08 30 Nov 1999 HG

<0.2 BH #3

Hg .095 ug/l .000 .095

$\bar{X}$ = <0.2 ug/l X 0.100 l = <0.02 ug

*** Sample ID: 1384123 Seq: 113 14:12:15 30 Nov 1999 HG

<0.2 BH #3

Hg .093 ug/l .000 .093

*** Check Standard: 4 Ck4IPC/CCV Seq: 114 14:14:21 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01 ✓	5.00	ug/l	.000

$\bar{X}$ = 4.98 ug/l 99%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 115 14:16:39 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.8	4.94 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 116 14:18:58 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-29000	-.029 ✓	.000	ug/l	.000

$\bar{X}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 117 14:21:05 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.019 ✓	.200	ug/l	.000

*** Sample ID: 1384133 Seq: 118 14:23:11 30 Nov 1999 HG

<0.2 BH BT

Hg .046 ug/l .000 .046

$\bar{X}$ = <0.2 ug/l X 0.100 l = <0.02 ug

*** Sample ID: 1384133 Seq: 119 14:25:18 30 Nov 1999 HG

<0.2 BH BT

Hg .049 ug/l .000 .049

*** Sample ID: ESP.STACK Seq: 120 14:27:25 30 Nov 1999 HG

<0.2 SB THIMBLE

Hg .041 ug/l .000 .041

$\bar{X}$ = <0.2 ug/l X 0.100 l = <0.02 ug

*** Sample ID: ESP.STACK Seq: 121 14:29:33 30 Nov 1999 HG

<0.2 SB THIMBLE

Hg .032 ug/l .000 .032

*** Sample ID: ESP.STACK Seq: 122 14:31:40 30 Nov 1999 HG

<0.2 SB THIMBLE

Hg .036 ug/l .000 .036

*** Sample ID: ESP.STACK Seq: 123 14:33:47 30 Nov 1999 HG

11/30/99 9R SB THIMBLE

Hg .037 ug/l .000 .037

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Folder: 113099HG

14:35:54 30 Nov 1999 Protocol: ONTARIO

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

*** Sample ID: ESP.STACK Matrix Spk. Seq: 124 14:35:54 30 Nov 1999 HG
SB THIMBLE MS
Matrix Spike T.V. = 2.00 ug/l x 0.100 l = (0.2
Hg 1.69 ug/l .000 1.67 $\bar{x}$ = 1.69 ug/l x 0.100 l = (0.169 ug) 85%R

*** Sample ID: ESP.STACK Seq: 125 14:39:03 30 Nov 1999 HG
SB THIMBLE MS
Hg 1.62 ug/l .000 1.68

*** Sample ID: ESP INLET #1384160 Seq: 126 14:40:13 30 Nov 1999 HG
<0.2 SB FILTER
Hg .005 ug/l .000 .005 $\bar{x}$ = <0.2 ug/l x 0.100 l = (<0.02 ug)

*** Sample ID: ESP INLET Seq: 127 14:42:20 30 Nov 1999 HG
<0.2 SS FILTER
Hg .009 ug/l .000 .009

*** Check Standard: 4 Ck4IPC/CCV Seq: 128 14:44:29 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01 ✓	5.00	ug/l	.000

$\bar{x}$ = (4.96 ug/l) (99%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 129 14:46:45 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 130 14:49:02 30 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-30000	-.030	.200	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 131 14:51:09 30 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.030	.200	ug/l	.000

*** Sample ID: 1384167 Seq: 132 14:53:15 30 Nov 1999 HG
ESP0#1
Hg 13.8 ug/l .000 13.8 $\bar{x}$ = 13.9 ug/l x 0.100 l = (1.39 ug)

*** Sample ID: 1384167 Seq: 133 14:55:42 30 Nov 1999 HG
ESP0#1
Hg 13.9 ug/l .000 13.9

*** Sample ID: 1384172 Seq: 134 14:58:10 30 Nov 1999 HG
ESP0#2
Hg 7.67 ug/l .000 7.67 $\bar{x}$ = 7.68 ug/l x 0.100 l = (0.768 ug)

*** Sample ID: 1384172 Seq: 135 15:00:30 30 Nov 1999 HG
ESP0#2
Hg 7.70 ug/l .000 7.70

Total Particle-Bound Mercury con't.

(7) # 1382173 (Inlet #1)

<0.02 ug Hg ash + 0.089 ug Hg pr = 0.089 ug Hg part

(8) 1382177 (Inlet #2)

<0.02 ug Hg ash + <0.025 ug Hg pr = <0.025 ug Hg part.

(9) 1382181 (Inlet # 3)

<0.02 ug Hg ash + <0.031 ug Hg pr = <0.031 ug Hg part.

(10) 1382190 (Inlet BT)

<0.02 ug Hg ash + <0.027 ug Hg pr = <0.027 ug Hg part.

(11) 1382211 (Stack #1)

<0.02 ug Hg ash + <0.015 ug Hg pr = <0.02 ug Hg part

(12) 1382215 (Stack #2)

<0.02 ug Hg ash + <0.024 ug Hg pr = <0.02 ug Hg part

(13) 1382219 (Stack #3)

<0.02 ug Hg ash + <0.018 ug Hg pr = <0.02 ug Hg part

(14) 1382228 (Stack BT)

<0.02 ug Hg ash + <0.024 ug Hg pr = <0.02 ug Hg part

~~180322~~
187900
187901

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*

File Name: *HG-113099*

Concentration Units: ug/l

Analyte	QCS			IPC/CCV				
	True	Found	%R	True	Found	%R	Found	%R
Mercury	5.00	5.00	100.0	5.00	5.09	101.8	5.15	103.0

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.75	95.0	4.83	96.6	4.95	99.0

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.91	98.2	4.98	99.6	4.98	99.6

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-113099

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.87	97.4		#VALUE!		

rms 2/25/98

rms 5/20/98

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-113099*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name *Philip Analytical Services*

File Name *HG-113099*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#5		#6	c	#7	c	#8	c	#9	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

3A

Method Blank

Lab Name: *Philip Analytical Services*

File Name: *HG-113099*

Batch: 112999A ASH

	1382224
	Method Blank
	ug
Mercury	< 0.02

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*
Batch: *112999A ASH*

	1382186 -
	Method Blank
	(ug)
Mercury	< 0.02

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-113099* Batch: 112999A ASH

Sample Number: *1382177*

Concentration Units:ug Hg

		Matrix Spike								
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c					
Mercury	< 0.02	0.20	0.194	97.0						

5/20/98 rms

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-113099* Batch: 112999A ASH

Sample Number: *1382177*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.02	< 0.02	< 0.02	

Must be within 10 % difference

rms 5/20/1998

Metal PQLS

Lab Name: *Philip Analytical Services*
File Name: *HG-113099*

Element	Water PQL (ug/l)	Soil PQL (ug/g)
Mercury	< 0.20	< 0.04

PQLs
rms 5/21/98

187901 -C
187900 -

Data Package Cover Sheet for Atomic Absorption Spectroscopy by Automated Cold Vapor Analysis

Date of Analysis: 11/22/99	Element: HG – Ontario Hydro Method
Analyst: [signature]	Time of Analysis: 0843
Data Validated by: V. Cyrus 12/2/99	Instrument: Leeman PS 200

Calibration Standard Preparation Records

Preparation Record is in Notebook #	Date of Preparation
360-28-9 to 14	11/21/99

Quality Control Sample Preparation Records

Name	Preparation is in Notebook #	Date of Preparation
QCS/ICV	360-28-17	11/21/99
IPC/CCV	360-28-16	11/21/99

- Mercury's Linear Dynamic Range (LDR) is 25ug/L.

- See 11/30/99 for analysis of the thimble/filters and Total Particle Bound - Hg calculations.

I Certify that all QA/QC results were acceptable and that there were no problems except as noted.

Jennifer L Pais 11/29/99
Signature of Analyst and Date

RunProt: ontario
RunFold: 1122998 Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 08:27:45 22 Nov 1999 Xmit: Off Gas: 0.30 LPM
Idle User: A/S: On

AUTOSAMPLER: Rack entry Rack RACK#1

cup	ID	Extended id	Weight	Volume	Macro
1	QCS 11/22	5.00 UG/L ONTARIO	1.0000	1.0000	
2	1382195	INLET BLK 10% HNO3	1.0000	1.0000	
3	1382232	STACK BLK 10% HNO3	1.0000	1.0000	
4	LFB H202	11/19	1.0000	1.0000	
5	LFB H202	11/19 2.00 UG/L	1.0000	1.0000	
6	1382226	BLK STACK H202	1.0000	1.0000	
7	1382198	BLK INLET H202	1.0000	1.0000	
8	1382159	H202	1.0000	1.0000	
9	1382163	H202	1.0000	1.0000	
10	1382167	H202	1.0000	1.0000	
11	1382171	H202	1.0000	1.0000	
12	1382175	H202	1.0000	1.0000	
13	1382179	H202	1.0000	1.0000	
14	1382183	H202	1.0000	1.0000	
15	1382187	H202	1.0000	1.0000	

PgDn

Cup 1 extended ID: 5.00 UG/L ONTARIO Call entry down Ins to switch

```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:27:46 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                              User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#1 PgUp

cup	ID	Extended id	Weight	Volume	Macro
16	1382183 MS	2.00 UG/L H2O2	1.0000	1.0000	
17	1382192	H2O2	1.0000	1.0000	
18	1382213	H2O2	1.0000	1.0000	
19	1382217	H2O2	1.0000	1.0000	
20	1382221	H2O2	1.0000	1.0000	
21	1382230	H2O2	1.0000	1.0000	
22	LRB	0.1N HNO3 11/19	1.0000	1.0000	
23	LFB	0.1N HNO2 2.0 UG/L	1.0000	1.0000	
24	1382189	INLET HNO3 BLK	1.0000	1.0000	
25	1382227	STACK HNO3 BLK	1.0000	1.0000	
26	1382157	0.1N HNO3	1.0000	1.0000	
27	1382161	0.1N HNO3	1.0000	1.0000	
28	1382165	0.1N HNO3	1.0000	1.0000	
29	1382165	0.1N HNO3	1.0000	1.0000	
30	1382165 MS	0.1 N HNO3 2.0 UG/L	1.0000	1.0000	

PgDn

Cup 16 extended ID: 2.00 UG/L H2O2 Cell entry down Ins to switch

RunProt: ontario
RunFold: 112279HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 08:27:47 22 Nov 1999 Xmit: Off Gas: 0.30 LPM
User: A/S: On
Idle

PgUp

AUTOSAMPLER: Rack entry Rack RACK#1

Cup	ID	Extended id	Weight	Volume	Macro
31	1382169	0.1N HNO3	1.0000	1.0000	
32	1382173	0.1N HNO3	1.0000	1.0000	
33	1382177	0.1N HNO3	1.0000	1.0000	
34	1382181	0.1N HNO3	1.0000	1.0000	
35	1382190	0.1N HNO3	1.0000	1.0000	
36	1382211	0.1N HNO3	1.0000	1.0000	
37	1382215	0.1N HNO3	1.0000	1.0000	
38	1382219	0.1N HNO3	1.0000	1.0000	
39	1382228	0.1N HNO3	1.0000	1.0000	
40	LRB KCL	11/19	1.0000	1.0000	
41	LFB KCL	11/19 2.00 UG/L	1.0000	1.0000	
42	1382223	STACK BLK KCL	1.0000	1.0000	
43	1382223	STACK BLK KCL	1.0000	1.0000	
44	1382223 MS	2.00 UG/L	1.0000	1.0000	

PgDn

Cup 31 extended ID: 0.1N HNO3 Cell entry down Ins to switch

```
RunProt: ontario
RunFold: 112299HG Seq: 0     Batch:
                  Prnt: R/T On
                  Rev: 4.0     08:33:35 22 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                                User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#2

cup	ID	Extended id	Weight	Volume	Macro
1	1382185	INLET BLK KCL	1.0000	1.0000	
2	1382158	KCL	1.0000	1.0000	
3	1382162	KCL	1.0000	1.0000	
4	1382166	KCL	1.0000	1.0000	
5	1382170	KCL	1.0000	1.0000	
6	1382174	KCL	1.0000	1.0000	
7	1382178	KCL	1.0000	1.0000	
8	1382182	KCL	1.0000	1.0000	
9	1382191	KCL	1.0000	1.0000	
10	1382212	KCL	1.0000	1.0000	
11	1382212	KCL	1.0000	1.0000	
12	1382212 MS	KCL 2.00 UG/L	1.0000	1.0000	
13	1382216	KCL	1.0000	1.0000	
14	1382220	KCL	1.0000	1.0000	
15	1382229	KCL	1.0000	1.0000	

PgDn

```
Cup 1  extended ID: INLET BLK KCL                Cell entry down Ins to switch
```

```
RunProt: ontario
RunFold: 112299HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:33:35 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
                                                   User:              A/S: On
  Idle
```

PgUp

AUTOSAMPLER: Rack entry Rack RACK#2

cup	ID	Extended id	Weight	Volume	Macro
16	LRB KMNO4	11/19	1.0000	1.0000	
17	LFB KMNO4	11/19 2.00 UG/L	1.0000	1.0000	
18	1382225	STACK BLK KCL	1.0000	1.0000	
19	1382187	INLET BLK KCL	1.0000	1.0000	
20	1382160	KCL	1.0000	1.0000	
21	1382164	KCL	1.0000	1.0000	
22	1382168	KCL	1.0000	1.0000	
23	1382172	KCL	1.0000	1.0000	
24	1382176	KCL	1.0000	1.0000	
25	1382176	KCL	1.0000	1.0000	
26	1382176 MS	KCL 2.00 UG/L	1.0000	1.0000	
27	1382180	KCL	1.0000	1.0000	
28	1382184	KCL	1.0000	1.0000	
29	1382193	KCL	1.0000	1.0000	
30	1382214	KCL	1.0000	1.0000	

PgDn

```
Cup 16 extended ID: 11/19                    Cell entry down Ins to switch
```

```
RunProt: ontario
RunFold: 112299HG Seq: 0     Batch:
                  Prnt: R/T On
                  Rev: 4.0     08:33:36 22 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                                User:              A/S: On
```

AUTOSAMPLER: Rack entry Rack RACK#2 PgUp

cup	ID	Extended id	Weight	Volume	Macro
31	1382218	KCL	1.0000	1.0000	
32	1382222	KCL	1.0000	1.0000	
33	1382231	KCL	1.0000	1.0000	
34	1382231	KCL	1.0000	1.0000	
35	1382231	MS 2.00 UB/L KCL	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 extended ID: KCL                          Cell entry down Ins to switch
```

Book #118

18/1901 Pg. #55

Gaseous Hydrogen Methal (cont'd from 12/xx/01)

Analyst / Date / Time Started	Sample ID	Initial Sample Vol. (mL)	(L) Final Volume (mL)	Solid Volume used for digestion (mL)	Volume 10% H_2SO_4 (added) (mL)	Volume conc. HNO_3 (mL)	Volume 5% Kmno4 (mL)	Volume HCl (mL)	(mL) Volume 5% H_2O_2	Volume HCl Hydroxylamine (mL)	Comments
1/11	1382195	0.278	–	–	–	–	–	–	–	–	
	1382230	0.155	–	–	–	–	–	–	–	–	
	LRB - H_2O_2	–	–	10 mL	0.5 mL	–	18 mL	0.5 mL	1.5 mL	4 mL	
	LFB - H_2O_2 (colour out)	–	–			–	18 mL			5 mL	
	1382188	0.2852	0.250 L			–	40 mL			3 mL	
	1382159	0.130	0.250 L			–	18 mL				
	2163	0.132				–	18 mL				
	2167	0.152				–	18 mL				
	2171	0.146				–	18 mL				
	2175	0.146				–	18 mL				
	2179	0.134				–	18 mL				
	2183	0.148				–	18 mL				
	2192	0.136				–	18 mL				
	2213	0.148				–	22 mL				
	2217	0.150				–	22 mL				
	2221	0.164				–	18 mL				
	2230	0.140				–	22 mL				
	2226	0.136				–	26 mL				
1/11	LRB CLINHNO3	–	–	30 mL	1.5 mL	0.75 mL	4.5 mL	Not quite 25 mL	2.4 mL	3.0 mL	
	LFB CLINHNO3 (chem Bal)	–	–								
	1382189 (weighed)	0.300 L	–								
	1382227	0.1650 L	–								
	1382157	0.270	–								
	1382161	0.173	–								
	1382165	0.180	–								
	1382169	0.103	–								
	1382173	0.045	–								
	1382177	0.090	–								
	1382181	0.112	–								
	1382190	0.095	–								
	1382211	0.053	–								
	1382215	0.085	–								
	1382219	0.065	–								
	1382228	0.087	–								
1/11	LRB - KCL	–	–					–	2.25 mL	3.0	
	LFB - KCL (Client Std)	–	–					–			
	1382223 (Client Std 2185)	0.260	0.500 L					–			
		0.325	0.500 L					–			
	2158	0.650	0.650 L					–			
	2162	0.640	0.640 L					–			

Book #118

Pg. #56

Ontario Hydro Method (10/27/10 Rev.E)

187901

Analyst, 0.0 rinse	Sample ID	Initial sample wt (g)	Final sample wt (g) (record sample wt to the right up to)	Vol of 30% H_2O_2 (mL)	Vol of 1.5 M NaOH (mL)	Vol of 0.75 M H_2SO_4 (mL)	Vol of 4% KMnO4 (mL)	Vol of 10% $NH_2OH \cdot HCl$ (mL)	Vol of 5% KI (mL)	Vol of 0.2 N $K_2Cr_2O_7$ (mL)
7/19/11	1362166	0.750 g	0.750 g	30 mL	1.5 mL	0.75 mL	4.5 mL	—	2.25 mL	3.0 mL
	2170	0.480 g	0.500 g							
	2174	0.950 g	0.950 g							
	2178	0.900 g	0.900 g							
	2182	0.890 g	0.890 g							
	2191	0.550 g	0.550 g							
	2212	0.695 g	0.695 g							
	2216	0.787 g	0.787 g							
	2220	0.800 g	0.800 g							
	2229	0.480 g	0.500 g							
7/22/11	LRB-KMnO4	—	—	30 mL	—	1.5 mL	4.5 mL	—	2.25 mL	3.0 mL
	LRB-KMnO4	—	—		—		4.5 mL	—		
	1382225	0.250 g	0.500 g		—		4.5 mL	—		
	1382167	0.350 g	↓		—		4.5 mL	—		
	1382160	0.480 g			—		4.5 mL	—		
	2164	0.545 g	0.545 g		—		4.5 mL	—		
	2168	0.600 g	0.600 g		—		4.5 mL	—		
	2172	0.495 g	0.500 g		—		4.5 mL	—		
	2176	0.470 g			—		4.5 mL	—		
	2180	0.480 g			—		5.0 mL	—		
	2184	0.490 g			—		7.5 mL	—		
	2193	0.514 g	0.514		—		4.5 mL	—		
	2214	0.430 g	0.500		—		4.5 mL	—		
	2218	0.435 g	0.500 g		—		4.5 mL	—		
	2222	0.530 g	0.530 g		—		4.5 mL	—		
	2231	0.430 g	0.500 g		—		10.5 mL	—		

Reagents, QC, Standards Preparation Log #360

Date/Time	Initials	Exp. Date	Solution	Vol/Wt of Reagents #	Vol/Wt of Reagents Units	Reagent SSM ID #	Reagent SSM ID # Conc.	Final Volume #	Final Volume Units	Dilution Matrix	Remarks
1) 11/17/99	SMW		1.00 ug/l Std	50	ul	360-28-21	1.00 mg/l	50	ml	2.5 ml HNO3 + 2.5 ml HCl	NIOSH 6009
2)			2.00	100							
3)			5.00	250							
4)			IPC/CCV 2.0 ug/l	100							
5)			ICV/QCS 3.0 ug/l	150		360-28-22					
6) 11/19/99 0732	JH	—	1.00 mg/l Hg Stock Std	100	ul	Hg-995118509	1000 mg/l Hg	100	ml	0.15% HNO3	For Ontario Hydro Spikes
7) 11/21/99 0025	JH	11/22/99	1.00 mg/l Hg Stock Std	100	ul	Hg-9951185019	1000 mg/l Hg	100	ml		
8)			1.00 mg/l Hg QCS Stock	100	ul	Hg-995123001	1000 mg/l Hg	100	ml		
9)			Cal Blk	—	—	—	—	100	ml	10% HCl matrix	For Ontario Hydro method
10)			0.20 ug/l Hg Std	20	ul	360-29-7	1.00 mg/l Hg				
11)			0.50	50							
12)			2.00	200							
13)			5.00	500							
14)			10.0	1000							
15)			ICB/CCB For Hg	—	—	—	—				
16)			IPC/CCV 5.00 ug/l Hg	500	ul	360-29-7	1.00 mg/l Hg				
17)			QCS/ICV 5.00 ug/l Hg	500		360-29-8					
18)											
19)											
20)											
21)											
22)											
23)											
24)											
25)											

RunProt: ontario
RunFold: 112299HG Seq: 0 Batch:
Prnt: R/T On
Rev: 4.0 08:05:42 22 Nov 1999 Xmit: Off Gas: LPM
User: A/S: On
Idle

INSTRUMENT: Scheduled Maintenance

		Uses left	Last service	Next service
replace:	Pump tubing	461	17-Nov-99	27-Nov-99
	Waste drain tubing	2135	12-Nov-99	27-Oct-00
	Liquid/gas separator	1343	07-Sep-99	11-Oct-00
	pump head	10000	N/A	N/A
	Hg lamp	N/A	30-Aug-99	27-Jan-00
	Reductant bottle	460	22-Nov-99	26-May-00
	process tubing	1343	N/A	N/A
Clean optical cell		600	N/A	N/A

* - needs maintenance

```
RunProt: ontario
RunFold: 112277HG Seq: 0    Batch:
                  Prnt: R/T On
                  Rev: 4.0    08:35:08 22 Nov 1999 Xmit: Off  Gas:    0.30 LPM
  Idle                                              User:              A/S: On
```

```
UTILITY:  Diagnostics  Tip X      0 1    0
Aper test              Tip Y      0 1    0
Test optic             Tip Z     95 1    0
Tip home               Gas      334
Out port
In port
Run pcode
Cal A/S
```

aperture 2
acceptable Range = -100 to +100

```
Sensors on solenoid Enter for test Ins for motor More tests
Pcode halt 0      @ 344
```

```
RunProt: ontario
RunFold: 11227X13 Seq: 0    Batch:
                  Print: R/T On
                  Rev: 4.0    08:35:14 22 Nov 1999 Xmit: Off  Gas:     0.30 LPM
  Idle                                                  User:          A/S: On

UTILITY:  Diagnostics  Tip X      0 1    0
Aper test              Tip Y      0 1    0
Test optic             Tip Z     95 1    0
Tip home               Gas      334
Cut port                                      Smpl. intensity    1197237
In port                                       Ref. intensity     1201531
Run pcode
Cal A/S
```

3 1/10% difference acceptable

```
 Generate an solenoid Enter for test Ins for motor More tests
 Pcode halt 0      0 142
```

Calculations from Ontario Hydro Method
October 27, 1999 Draft.

DRAFT

15. Calculations for Particle-Bound, Oxidized, Elemental, and Total Mercury Concentrations:

15.1 *Particle-Bound Mercury*

15.1.1 *Case 1: Amount of Ash on the Filter is Greater Than 0.5 g*--Calculate the concentration of mercury in µg/g in the ash sample (Hg_{ash}) using Equation 4:

$$Hg_{ash}, \mu g/g = (IR)(DF) \qquad \text{[Eq. 4]}$$

where:
IR = instrument reading, µg/L
DF = dilution factor = (total digested volume, L)/(mass of ash digested, g)

Calculate the amount of mercury in the probe rinse (Hg_{pr}, Container 2) in µg using Equation 5:

$$Hg_{pr}, \mu g = (IR)(V_t) \qquad \text{[Eq. 5]}$$

where:
IR = instrument reading, µg/L.
V_t = total volume of probe rinse sample from which sample aliquot was taken, L

Equation 5 assumes no preparation steps are needed prior to analyzing the probe rinse for mercury using CVAA. Although not required, a persulfate digest can be done on the probe rinse sample as discussed in section 13.3.3. If the persulfate digest is done equation 5 becomes Hg_{pr}, µg = (IR)(V_t)(DF) where DF is the same as equation 9.

There is no filter blank subtraction when >0.5 g of ash are collected on the sample filter or thimble.

The total amount of particle-bound mercury (Hg_{tp}) is then determined using Equation 6:

$$Hg\ (particle), \mu g = (Hg_{ash})(W_{ash}) + Hg_{pr} \qquad \text{[Eq. 6]}$$

where:
W_{ash} = the total mass of ash on filter, g

The concentration of particle-bound mercury (µg/dscm) in the gas stream is then determined using Equation 7:

$$Hg^{tp}, \mu g/dscm = Hg\ (particle)/V_{m(std)} \qquad \text{[Eq. 7]}$$

where:
$V_{m(std)}$ is the total volume of dry gas sampled at standard (normal) conditions, dscm

15.1.2 *Case 2: Amount of Ash on the Filter is Less Than 0.5 g*—The calculation is the same as in Case 1 except the entire sample (ash and filter) is digested; therefore, DF in Equation 4 is defined only by the total digested volume. In addition a filter blank is subtracted as calculated in Equation 8.

$$Hg_{fb}, \mu g = (IR)(V_2) \qquad \text{[Eq. 8]}$$

where:
IR = instrument reading, µg/L
V_2 = total volume of sample filter blank digest, L

Equation 7 for Case 2 then becomes: Hg (particle), µg = $(Hg_{ash})(W_{ash}) - Hg_{fb} + Hg_{IM}$

15.2 *Oxidized Mercury*

15.2.1 *KCl Solution (Impingers 1–3)*—Calculate the concentration of mercury in µg/L in the KCl impinger solutions using Equation 9:

$$Hg_{KCl}, \mu g/L = (IR)(DF) \qquad \text{[Eq. 9]}$$

where:
IR = instrument reading, µg/L
DF = dilution factor, $\frac{V_D + V(H_2SO_4) + V(HNO_3) + V(KMnO_4) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$
V_D = total digested volume, 10 mL
$V(H_2SO_4)$ = volume of added concentrated H_2SO_4, 0.5 mL
$V(HNO_3)$ = volume of added concentrated HNO_3, 0.5 mL
$V(KMnO_4)$ = volume of added 5%$^{w}/_{v}$ $KMnO_4$, 1.5 mL
$V(K_2S_2O_8)$ = volume of added 5%$^{w}/_{v}$ $K_2S_2O_4$, 0.75 mL
$V(NH_2OH)$ = volume of added 10%$^{w}/_{v}$ hydroxylamine sulfate, 1.0 mL

The concentration of mercury in the KCl solution blank is calculated in the same way.

15.2.2 *Total Oxidized Mercury (Hg_O)*—is defined by method as the mercury measured in the KCl sample minus the mercury measured in the KCl solution blanks, as shown in Equation 10:

$$Hg_O, \mu g = (Hg_{KCl})(V_3) - (Hg_{Cb})(V_4) \qquad \text{[Eq. 10]}$$

where:
Hg_{KCl} = Mercury concentration measured in KCl aliquot, µg/L
V_3 = Total volume of aqueous KCl from which sample aliquot was taken, L
Hg_{Cb} = Mercury concentration measured in KCl solution blank aliquot, µg/L
V_4 = Volume of aqueous KCl originally charged to the impingers, L

The concentration of Hg^{2+} (µg/dscm) in the gas stream is then determined using Equation 11:

$$Hg^{2+}, \mu g/dscm = Hg_O/V_{m(std)} \quad \text{[Eq. 11]}$$

where:
$V_{m(std)}$ is the total volume of dry gas sampled at standard conditions, dscm

15.3 *Elemental Mercury*

15.3.1 *HNO_3–H_2O_2 Solution (Impinger 4)*—Calculate the concentration of mercury in µg/L in the HNO_3–H_2O_2 impinger solution using Equation 12:

$$Hg_{H2O2}, \mu g/L = (IR)(DF) \quad \text{[Eq. 12]}$$

where:
IR = instrument reading, µg/L
DF = dilution factor, $\frac{V_D + V(HCl) + V(H_2SO_4) + V(KMnO_4) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$
V_D = total digested volume, 5 mL
V(HCl) = volume of added concentrated HCl, 0.25 mL
$V(H_2SO_4)$ = volume of added concentrated H_2SO_4, 0.5 mL
$V(KMnO_4)$ = volume of added saturated $KMnO_4$, mL (volume need to turn sample to a purple color)
$V(K_2S_2O_8)$ = volume of added 5%$^W/_V$ $K_2S_2O_4$, 0.75 mL (if used)
$V(NH_2OH$ = volume of added 10%$^W/_V$ hydroxylamine sulfate, 1.0 mL

The concentration of mercury in the HNO_3–H_2O_2 solution blank is calculated in the same way.

15.3.2 *H_2SO_4–$KMnO_4$ Solution (Impingers 5–7)*—Calculate the concentration of mercury in µg/L in the H_2SO_4–$KMnO_4$ impinger solutions using Equation 13:

$$\text{Mercury}, \mu g/L = (IR)(DF) \quad \text{[Eq. 13]}$$
$_{KMnO_4}$

where:
DF = dilution factor, $\frac{V_D + V(HNO_3) + V(K_2S_2O_8) + V(NH_2OH)}{V_D}$
IR = instrument reading, µg/L
V_D = total digested volume, 5 mL
$V(HNO_3)$ = volume of added concentrated HNO_3, 0.5 mL
$V(K_2S_2O_8)$ = volume of added 5%$^W/_V$ $K_2S_2O_4$, 0.75 mL

The concentration of mercury in the H_2SO_4–$KMnO_4$ solution blank is calculated in the same way.

15.3.3 *Total Elemental Mercury (Hg_E)*—is defined by method as the mercury measured in the H_2SO_4–$KMnO_4$ impingers plus the mercury in the HNO_3–H_2O_2 impingers minus the solution blanks as shown in Equation 14:

$$Hg_E, \mu g = (Hg_{H2O2})(V_4) - (Hg_{Eb1})(V_5) + (Hg_{KMnO4})(V_6) - (Hg_{Eb2})(V_7) \qquad [Eq. 14]$$

where:

Hg_{H2O2} = Mercury concentration measured in HNO_3–H_2O_2 aliquot, µg/L
V_4 = Total volume of aqueous HNO_3–H_2O_2 from which sample aliquot was taken, L
V_5 = Volume of aqueous HNO_3–H_2O_2 originally charged to the impinger, L
Hg_{Eb1} = Mercury concentration measured in HNO_3–H_2O_2 solution blank aliquot, µg/L
Hg_{KMnO4} = Mercury concentration measured in H_2SO_4–$KMnO_4$ aliquot, µg/L
V_6 = Total volume of aqueous H_2SO_4–$KMnO_4$ from which sample aliquot was taken, L
V_7 = Volume of aqueous H_2SO_4–$KMnO_4$ originally charged to the impingers, L
Hg_{Eb2} = Mercury concentration measured in H_2SO_4–$KMnO_4$ solution blank aliquot, µg/L

The concentration of Hg^{2+} (µg/dscm) in the gas stream is then determined using Equation 15:

$$Hg^0, \mu g/dscm = Hg_E/V_{m(std)} \qquad [Eq. 15]$$

where:

$V_{m(std)}$ is the total volume of dry gas sampled at standard conditions, dscm

15.4 *Total Mercury*—Is defined by the method as the sum of the particulate bound mercury, oxidized mercury, and elemental mercury as shown in Equation 16:

$$Hg(total), \mu g/dscm = Hg^{tp} + Hg^{2+} + Hg^0 \qquad [Eq. 16]$$

16. Precision and Bias

16.1 *Precision*

16.1.1 Formal evaluation of the Ontario Hydro method was completed with dynamic spiking of Hg^0 and $HgCl_2$ into a flue gas stream.[9] The results are shown in Table 1. The relative standard deviation for gaseous elemental mercury and oxidized mercury was found to be less than 11% for mercury concentrations greater than 3 µg/Nm^3 and less than 34% for mercury concentrations less than 3 µg/Nm^3. In all cases, the laboratory bias for these tests based on a calculated correction factor was not statistically significant. These values were within the acceptable range, based on the criteria established in EPA Method 301 (% RSD less than 50%).

[9] EPRI. "Evaluation of Flue Gas Mercury Speciation Methods." EPRI TR-108988. Electric Power Research Institute, Palo Alto, CA, Dec. 1997.

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Standard: 1 Rep: 1				Seq: 9		08:37:59 22 Nov 1999 HG			
Hg	.000	ug/l	-859						
*** Standard: 1 Rep: 2				Seq: 1		08:40:08 22 Nov 1999 HG			
Hg	.000	ug/l	-1180						
*** Standard: 1 Rep: 1				Seq: 2		08:43:31 22 Nov 1999 HG			
Hg	.000	ug/l	-350						
*** Standard: 1 Rep: 2				Seq: 3		08:46:00 22 Nov 1999 HG			
Hg	.000	ug/l	-433						
*** Standard: 2 Rep: 1				Seq: 4		08:48:09 22 Nov 1999 HG			
Hg	.200	ug/l	18532						
*** Standard: 2 Rep: 2				Seq: 5		08:50:19 22 Nov 1999 HG			
Hg	.200	ug/l	18553						
*** Standard: 3 Rep: 1				Seq: 6		08:52:30 22 Nov 1999 HG			
Hg	.500	ug/l	46930						
*** Standard: 3 Rep: 2				Seq: 7		08:54:41 22 Nov 1999 HG			
Hg	.500	ug/l	46893						
*** Standard: 4 Rep: 1				Seq: 8		08:56:52 22 Nov 1999 HG			
Hg	2.00	ug/l	189376						
*** Standard: 4 Rep: 2				Seq: 9		08:59:06 22 Nov 1999 HG			
Hg	2.00	ug/l	189031						
*** Standard: 5 Rep: 1				Seq: 10		09:01:19 22 Nov 1999 HG			
Hg	5.00	ug/l	466212						
*** Standard: 5 Rep: 2				Seq: 11		09:03:39 22 Nov 1999 HG			
Hg	5.00	ug/l	464390						

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 6 Rep: 1				Seq: 12		09:05:59 22 Nov 1999 HG		
Hg	10.0	ug/l	906272					
*** Standard: 6 Rep: 2				Seq: 13		09:08:26 22 Nov 1999 HG		
Hg	10.0	ug/l	905490					

RunProt: ontario

RunFold: ii2299HG Seq: 14 Batch:

Prnt: R/T On

Rev: 4.0 09:09:48 22 Nov 1999 Xmit: Off Gas: 0.30 LPM

Idle User: A/S: On

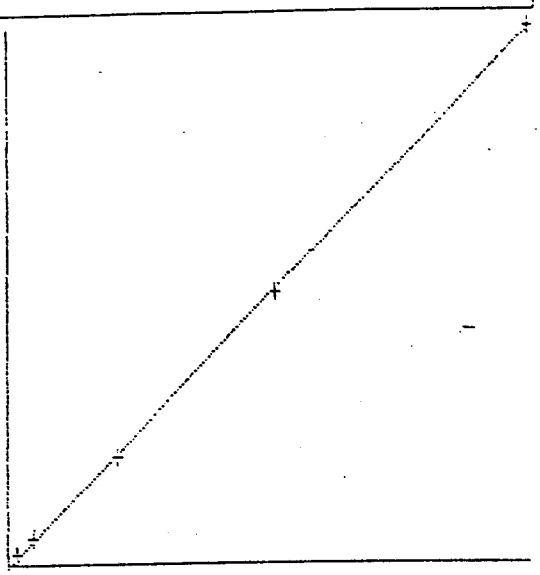
CALIBRATION: Line proto: ontario

	Hg Conc.	Calc.	Dev.	Accepted ->linear
S1	.000	-.039	-.039	Quadratic
S2	.200	.169	-.031	Utdlinear
S3	.500	.482	-.018	
S4	2.00	2.05	.048	Accept
S5	5.00	5.10	.101	
S6	10.0	9.94	-.060	

Correlation Coef.:

A .0000000 r .999877

B 1.10109e-5 C -3.50249e-2



Relative Absorbance

	Mean	%RSD		
S1	-396	-13.21	-359	-433
S2	18542	0.00	18532	18553
S3	46911	0.06	46930	46893
S4	189203	0.13	189376	189031
S5	466446	0.07	466212	466680
S6	985881	0.06	986272	985490

New cal coefficients stored

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 14 09:12:07 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 102. 5.12 5.00 ug/l .000
5.10 ug/l (102% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 15 09:14:29 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 102. 5.09 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 16 09:16:46 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -45000 -.045 .000 ug/l .000
$\bar{x}$ = (<0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 17 09:18:52 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.040 .200 ug/l .000

*** Sample ID: QCS 11/22 Seq: 18 09:20:58 22 Nov 1999 HG
5.00 UG/L ONTARIO
Hg 4.82 ug/l .000 4.82
$\bar{x}$ = (4.82 ug/l) (96% R)

*** Sample ID: QCS 11/22 Seq: 19 09:23:13 22 Nov 1999 HG
5.00 UG/L ONTARIO
Hg 4.83 ug/l .000 4.83

*** Sample ID: 1382195 Volume Recd = 0.278 l Seq: 20 09:25:31 22 Nov 1999 HG
<0.2
INLET BLK 10% HNO3
Hg -.047 ug/l .000 -.047
$\bar{x}$ = (<0.2 ug/l)(0.278 l) = (<0.06 ug)

*** Sample ID: 1382195 Seq: 21 09:27:35 22 Nov 1999 HG
<0.2
INLET BLK 10% HNO3
Hg -.038 ug/l .000 -.038

*** Sample ID: 1382202 Volume Recd = 0.155 l Seq: 22 09:29:39 22 Nov 1999 HG
<0.2
STACK BLK 10% HNO3
Hg -.040 ug/l .000 -.040
$\bar{x}$ = (<0.2 ug/l)(0.155 l) = (<0.04 ug)

*** Sample ID: 1382202 Seq: 23 09:31:43 22 Nov 1999 HG
<0.2
STACK BLK 10% HNO3
Hg -.037 ug/l .000 -.037

*** Sample ID: LRB H2C2 Seq: 24 09:33:47 22 Nov 1999 HG
<0.2
11/19
Hg .155 ug/l .000 .155
Dil. factor
$\bar{x}$ = (<0.2 ug/l) $\times$ (10 ml + 0.5 ml + 1.6 ml + 0.5 ml + 1.5 ml + 4 ml) / 10 ml
= (<0.7 ug/l)

*** Sample ID: LRB H2C2 Seq: 25 09:35:51 22 Nov 1999 HG
<0.2
11/19
Hg .147 ug/l .000 .147

Folder: 112299HG
Protocol: ontario

09:37:56 22 Nov 1999

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

*** Sample ID: LFB H202 — Seq: 26 — 09:37:56 22 Nov 1999 HG
11/15 2.00 UG/L (T.V.)
Hg .668 ug/l .000 .668
$\bar{x} = (0.666\ ug/L)\left(\frac{5ml + 0.5ml + 18ml + 0.5ml + 1.5ml}{10.ml}\right) = 2.36\ ug/L$ (118% R)

*** Sample ID: LFB H202 — Seq: 27 — 09:40:02 22 Nov 1999 HG
11/19 2.00 UG/L
Hg .663 ug/l .000 .663

*** Check Standard: 4 Ck4IPC/CCV — Seq: 28 — 09:42:07 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 103. 5.15 ✓ 5.00 ug/l .000
$\bar{x} = 5.11\ ug/L$ (102% R) — 1% difference

*** Check Standard: 3 Ck3IPC/CCV — Seq: 29 — 09:44:24 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 101. 5.07 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB — Seq: 30 — 09:46:43 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -4540@ -.045 ✓ .000 ug/l .000
$\bar{x} = <0.2\ ug/L$

*** Check Standard: 1 Ck1ICB/CCB — Seq: 31 — 09:48:50 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.040 ✓ .200 ug/l .000

*** Sample ID: 1382226 — Seq: 32 — 09:50:55 22 Nov 1999 HG
<0.2
BLK STACK H202
Hg .041 ug/l .000 .041
$\bar{x} = (<0.2\ ug/L)\left(\frac{10ml + 0.5 + 26 + 0.5 + 1.5 + 3ml}{10.ml}\right) = (<0.9\ ug/L)(0.250L) = <0.2\ ug$

*** Sample ID: 1382226 — Seq: 33 — 09:53:29 22 Nov 1999 HG
<0.2
BLK STACK H202
Hg .043 ug/l .000 .043

*** Sample ID: 1382168 — Seq: 34 — 09:55:04 22 Nov 1999 HG
<0.2
BLK INLET H202
Hg -.017 ug/l .000 -.017
$\bar{x} = (<0.2\ ug/L)\left(\frac{10ml + 0.5ml + 40ml + 0.5ml + 1.5ml}{10ml}\right) = (<1.11\ ug/L)(0.250L) = <0.28\ ug$

*** Sample ID: 1382168 — Seq: 35 — 09:57:09 22 Nov 1999 HG
<0.2
BLK INLET H202
Hg -.015 ug/l .000 -.015

*** Sample ID: 1382159 — Seq: 36 — 09:59:14 22 Nov 1999 HG
H202
Hg .550 ug/l .000 .550
$\bar{x} = (0.543\ ug/L)\left(\frac{10ml + 0.5 + 18 + 0.5 + 1.5 + 3ml}{10ml}\right) = (1.82\ ug/L)(0.250L) = 0.455\ ug$
Dilution factor = 3.
3% difference

*** Sample ID: 1382159 — Seq: 37 — 10:01:21 22 Nov 1999 HG
H202
.57 ug/l .000 .57

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

*** Sample ID: 1382163 Seq: 38 10:03:40 22 Nov 1999 HG

H202

Hg .656 ug/l .000 .656

$\bar{x}$ = (0.683 ug/l)(3.35) ← Dilution factor
= (2.29 ug/l)(0.250 l)
= 0.572 ug

*** Sample ID: 1382163 Seq: 39 10:05:50 22 Nov 1999 HG

H202

Hg .690 ug/l .000 .690

*** Sample ID: 1382167 Seq: 40 10:08:00 22 Nov 1999 HG

H202

Hg .580 ug/l .000 .580

$\bar{x}$ = (0.580 ug/l)(3.35) ✓ Dilution factor
= (1.94 ug/l)(0.250 l)
= 0.486 ug

*** Sample ID: 1382167 Seq: 41 10:10:08 22 Nov 1999 HG

H202

Hg .579 ug/l .000 .579

*** Check Standard: 4 Ck4IPC/CCV Seq: 42 10:12:15 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.10 ✓	5.00	ug/l	.000

$\bar{x}$ = 5.09 ug/l (102% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 43 10:14:35 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		102.	5.08 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 44 10:16:52 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		*****	-.003 ✓	.000	ug/l	.000

$\bar{x}$ = (<0.2 ug/l)

*** Check Standard: 1 Ck1ICB/CCB Seq: 45 10:18:59 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.003 ✓	.200	ug/l	.000

*** Sample ID: 1382171 Seq: 46 10:21:05 22 Nov 1999 HG

<0.2

H202

Hg .062 ug/l .000 .062

$\bar{x}$ = (<0.2 ug/l)(3.35)
= (<0.67 ug/l)(0.250 l)
= <0.17 ug

*** Sample ID: 1382171 Seq: 47 10:23:10 22 Nov 1999 HG

<0.2

H202

Hg .061 ug/l .000 .061

*** Sample ID: 1382175 Seq: 48 10:25:15 22 Nov 1999 HG

H202

Hg 1.06 ug/l .000 1.06

$\bar{x}$ = (1.06 ug/l)(3.35)
= (3.55 ug/l)(0.250 l)
= 0.888 ug

*** Sample ID: 1382175 Seq: 49 10:27:29 22 Nov 1999 HG

H202

Hg 1.06 ug/l .000 1.06

Folder: 11229HG
Protocol: ontario

10:29:39 22 Nov 1999

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

*** Sample ID: 1382179 Seq: 50 10:29:39 22 Nov 1999 HG
H202
Hg .991 ug/l .000 .991
$\bar{x}$ = (0.996 ug/l)(3.35) = (3.33 ug/l)(0.250L) = 0.834 ug

*** Sample ID: 1382179 Seq: 51 10:31:54 22 Nov 1999 HG
H202
Hg 1.00 ug/l .000 1.00

*** Sample ID: 1382183 Seq: 52 10:33:59 22 Nov 1999 HG
H202
Hg .817 ug/l .000 .817
$\bar{x}$ = (0.814 ug/l)(3.35) = (2.73 ug/l)(0.250L) = 0.683 ug

equal pipette usage

*** Sample ID: 1382183 Seq: 53 10:36:12 22 Nov 1999 HG
H202
Hg .814 ug/l .000 .814

*** Sample ID: 1382183 Seq: 54 10:38:25 22 Nov 1999 HG
H202
Hg .810 ug/l .000 .810

*** Sample ID: 1382183 Seq: 55 10:40:39 22 Nov 1999 HG
11/22/99 gp
H202
Hg .835 ug/l .000 .835

*** Check Standard: 4 CK4IPC/CCV Seq: 56 10:42:56 22 Nov 1999 HG
Line Flag %Rev. Found True Units SD/RSD
Hg 102. 5.09 ✓ 5.00 ug/l .000
$\bar{x}$ = 5.05 ug/l (101%R)

*** Check Standard: 3 CK3IPC/CCV Seq: 57 10:45:14 22 Nov 1999 HG
Line Flag %Rev. Found True Units SD/RSD
Hg 100. 5.02 ✓ 5.00 ug/l .000

*** Check Standard: 2 CK2ICB/CCB Seq: 58 10:47:31 22 Nov 1999 HG
Line Flag %Rev. Found True Units SD/RSD
Hg -419.00 -.042 ✓ .000 ug/l .000
$\bar{x}$ = (0.2 ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 59 10:49:38 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.000 ✓ .200 ug/l .000

*** Sample ID: 1382183 MS (matrix spk) Seq: 60 10:51:43 22 Nov 1999 HG
2.00 UG/L H202
Hg 1.65 ug/l .000 2.62
SPLT.V. = (2.00 ug/l)(3.35) = (6.7 ug/l)(0.250L) = 1.68 ug
$\bar{x}$ = (2.63 ug/l)(3.35) = (8.81 ug/l2)(0.250L) = 2.20 ug
90%R

*** Sample ID: 1382183 MS (matrix spk) Seq: 61 10:54:07 22 Nov 1999 HG
2.00 UG/L H202
Hg 1.71 ug/l .000 2.54

Folder: 112299HG
Protocol: ontario

10:56:25 22 Nov 1999

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

*** Sample ID: 1382192 Seq: 62 10:56:25 22 Nov 1999 HG

Hg	<0.2 .027	ug/l	H202 .000	.027	$\bar{X}$ = (<0.2ug/l)(3.35) = (<0.67ug/l)(0.25l) = <0.17ug

*** Sample ID: 1382192 Seq: 63 10:58:29 22 Nov 1999 HG

Hg	<0.2 .032	ug/l	H202 .000	.032	

*** Sample ID: 1382213 Seq: 64 11:00:33 22 Nov 1999 HG

Hg	<0.2 .071	ug/l	H202 .000	.071	$\bar{X}$ = (<0.2ug/l) × (10ml+0.5ml+22ml+0.5ml+1.5ml+3ml / 10ml) (diluted for 3.75) = (<0.75ug/l)(0.25l) = <0.19ug

*** Sample ID: 1382213 Seq: 65 11:02:38 22 Nov 1999 HG

Hg	<0.2 .067	ug/l	H202 .000	.067	

*** Sample ID: 1382217 Seq: 66 11:04:42 22 Nov 1999 HG

Hg	<0.2 .148	ug/l	H202 .000	.148	$\bar{X}$ = (<0.2ug/l)(3.75) = (<0.75ug/l)(0.25l) = <0.19ug

*** Sample ID: 1382217 Seq: 67 11:06:47 22 Nov 1999 HG

Hg	<0.2 .149	ug/l	H202 .000	.149	

*** Sample ID: 1382221 Seq: 68 11:08:52 22 Nov 1999 HG

Hg	<0.2 .047	ug/l	H202 .000	.047	$\bar{X}$ = (<0.2ug/l)(3.35) = (<0.67ug/l)(0.25l) = <0.17ug

*** Sample ID: 1382221 Seq: 69 11:10:57 22 Nov 1999 HG

Hg	<0.2 .050	ug/l	H202 .000	.050	

*** Check Standard: 4 CK4IPC/CCV Seq: 70 11:13:04 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD	
Hg		99.6	4.98 ✓	5.00	ug/l	.000	$\bar{X}$ = 4.98ug/l (100%R)

*** Check Standard: 3 CK3IPC/CCV Seq: 71 11:15:19 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.5	4.98 ✓	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 72 11:17:57 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD	
Hg		-46.000	-.046 ✓	.000	ug/l	.000	$\bar{X}$ = <0.2ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 73 11:19:44 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
[illegible]		[illegible] ✓	[illegible]	ug/l	.000

Folder: 112299HG
Protocol: ontario

11:21:50 22 Nov 1999

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

*** Sample ID: 1382230 Seq: 74 11:21:50 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.051	ug/l	.000	.051	

$\bar{x} = (<0.2\,ug/l)(3.75)$
$= (<0.75\,ug/l)(0.25\,l)$
$= <0.19\,ug$

*** Sample ID: 1382230 Seq: 75 11:23:55 22 Nov 1999 HG

	<0.2		H2O2		
Hg	.048	ug/l	.000	.048	

*** Sample ID: LRB Seq: 76 11:26:01 22 Nov 1999 HG

	<0.2		0.1N HNO3 11/19		
Hg	-.022	ug/l	.000	-.022	

$\bar{x} = (<0.2\,ug/l)\left(\frac{30\,ml + 1.5\,ml + 0.75\,ml + 4.5\,ml + 2.4\,ml + 3.}{30\,ml}\right)$ dilution factor (1.405
$= <0.28\,ug/l$

*** Sample ID: LRB Seq: 77 11:28:06 22 Nov 1999 HG

	<0.2		0.1N HNO3 11/19		
Hg	-.045	ug/l	.000	-.045	

*** Sample ID: LFB Seq: 78 11:30:11 22 Nov 1999 HG (Rechecked on pg. 565)

			T.V. = 0.1N HNO2 2.0 UG/L		
Hg	1.07	ug/l	.000	1.07	

$\bar{x} = (1.08\,ug/l)(1.405)$
$= 1.52\,ug/l$ 76%R

*** Sample ID: LFB Seq: 79 11:32:26 22 Nov 1999 HG

			0.1N HNO2 2.0 UG/L		
Hg	1.08	ug/l	.000	1.08	

*** Sample ID: 1382189 Seq: 80 11:34:33 22 Nov 1999 HG

	<0.2		INLET HNO3 BLK		
Hg	-.016	ug/l	.000	-.016	

$\bar{x} = (<0.2\,ug/l)(1.405)$
$= (<0.28\,ug/l)(0.300\,l)$
$= <0.084\,ug$

*** Sample ID: 1382189 Seq: 81 11:36:38 22 Nov 1999 HG

	<0.2		INLET HNO3 BLK		
Hg	-.018	ug/l	.000	-.018	

*** Sample ID: 1382227 Seq: 82 11:38:43 22 Nov 1999 HG

	<0.2		STACK HNO3 BLK		
Hg	-.023	ug/l	.000	-.023	

$\bar{x} = (<0.2\,ug/l)(1.405)$
$= (<0.28\,ug/l)(0.165\,l)$
$= <0.046\,ug$

*** Sample ID: 1382227 Seq: 83 11:40:50 22 Nov 1999 HG

	<0.2		STACK HNO3 BLK		
Hg	-.022	ug/l	.000	-.022	

*** Check Standard: 4 Ck4IPC/CCV Seq: [illegible] 11:42:56 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		[illegible]	[illegible] ✓	5.00	ug/l	.000

$\bar{x} = 4.93\,ug/l$ 98%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 85 11:45:15 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
[illegible]		[illegible]	[illegible] ✓	5.00	ug/l	.000

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11:47:33 22 Nov 1999

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

*** Check Standard: 2 Ck2ICB/CCB Seq: 86 11:47:33 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-37900	-.038 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 87 11:49:39 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.032 ✓	.200	ug/l	.000

*** Sample ID: 1382157 Outlet #1 Seq: 88 11:51:45 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	.051	ug/l	.000	.051	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.270l)
= <0.076ug

*** Sample ID: 1382157 Seq: 89 11:53:50 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	.051	ug/l	.000	.051	

*** Sample ID: 1382161 Outlet #2 Seq: 90 11:55:55 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	.036	ug/l	.000	.036	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.173l)
= <0.048ug

*** Sample ID: 1382161 Seq: 91 11:58:01 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	.029	ug/l	.000	.029	

uired
plicate
lysis

*** Sample ID: 1382165 Outlet #3 Seq: 92 12:00:08 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	-.009	ug/l	.000	-.009	

$\bar{x}$ = (<0.2ug/l)(1.405)
= (<0.28ug/l)(0.180l)
= <0.051ug

*** Sample ID: 1382165 Seq: 93 12:02:14 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	-.007	ug/l	.000	-.007	

*** Sample ID: 1382165 Seq: 94 12:04:21 22 Nov 1999 HG

	<0.2		0.1N HNO3		
Hg	-.010	ug/l	.000	-.010	

*** Sample ID: 1382165 Seq: 95 12:06:26 22 Nov 1999 HG

	<0.2	11/22/99 JHP	0.1N HNO3		
Hg	-.003	ug/l	.000	-.003	

*** Sample ID: 1382165 MS matrix Spk Seq: 96 12:08:33 22 Nov 1999 HG

			0.1 N HNO3 2.0 UG/L		
Hg	1.73	ug/l	.000	1.73	

Spk T.V. = (2.00ug/l)(1.405) = 2.81ug/l
= (2.81ug/l)(0.180l)
= 0.506ug

*** Sample ID: 1382165 MS matrix Spk Seq: 97 12:10:56 22 Nov 1999 HG

			0.1 N HNO3 2.0 UG/L		
Hg	1.71	ug/l	.000	1.71	

$\bar{x}$ = (1.72ug/l)(1.405)
= (2.42ug/l)(0.180l)
= 0.435ug

86%R

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

*** Check Standard: 4 Ck4ICB/CCV Seq: 98 12:13:11 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD $\bar{x}$ = 4.93ugle 98%R
Hg 98.5 4.92 ✓ 5.00 ug/l .000

*** Check Standard: 3 Ck3ICB/CCV Seq: 99 12:15:23 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.3 4.92 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 100 12:17:41 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD $\bar{x}$ = <0.2ugle
Hg -42400 -.042 ✓ .000 ug/l .000

*** Check Standard: 1 Ck1ICB/CCB Seq: 101 12:19:49 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.036 ✓ .200 ug/l .000

*** Sample ID: 1382169 Outlet BT Seq: 102 12:21:55 22 Nov 1999 HG
<0.2 0.1N HNO3 $\bar{x}$ = (<0.2ugle)(1.405)
Hg .030 ug/l .000 .030 = (<0.28ugle)(0.103e)
= <0.021ug

*** Sample ID: 1382169 Seq: 103 12:24:01 22 Nov 1999 HG
<0.2 0.1N HNO3
Hg .024 ug/l .000 .024

*** Sample ID: 1382173 Inlet #1 Seq: 104 12:26:07 22 Nov 1999 HG
0.1N HNO3 $\bar{x}$ = (1.40ugle)(1.405)
Hg 1.40 ug/l .000 1.40 = (1.97ugle)(0.045e)
= 0.089ug

*** Sample ID: 1382173 Seq: 105 12:28:14 22 Nov 1999 HG
0.1N HNO3
Hg 1.39 ug/l .000 1.39

*** Sample ID: 1382177 Inlet #2 Seq: 106 12:30:21 22 Nov 1999 HG
<0.2 0.1N HNO3 $\bar{x}$ = (<0.2ugle)(1.405)
Hg .015 ug/l .000 .015 = (<0.28ugle)(0.090e)
= <0.025ug

*** Sample ID: 1382177 Seq: 107 12:32:27 22 Nov 1999 HG
<0.2 0.1N HNO3
Hg .026 ug/l .000 .026

*** Sample ID: 1382181 Inlet #3 Seq: 108 12:34:36 22 Nov 1999 HG
<0.2 0.1N HNO3 $\bar{x}$ = (<0.2ugle)(1.405)
Hg -.012 ug/l .000 -.012 = (<0.28ugle)(0.112e)
= <0.031ug

*** Sample ID: 1382181 Seq: 109 12:36:42 22 Nov 1999 HG
<0.2 0.1N HNO3
Hg .007

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

*** Sample ID: 1382190 Test BT Seq: 110 12:38:50 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	.002	ug/l	.000	.002

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.095e) = (<0.027ug)

*** Sample ID: 1382190 Seq: 111 12:40:57 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	.060	ug/l	.000	.060

*** Check Standard: 4 CK4IPC/CCV Seq: 112 12:43:05 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.3	4.91 ✓	5.00	ug/l	.000

$\bar{x}$ = (4.91ugle) (98%R)

*** Check Standard: 3 CK3IPC/CCV Seq: 113 12:45:23 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.2	4.91 ✓	5.00	ug/l	.000

*** Check Standard: 2 CK2ICB/CCB Seq: 114 12:47:38 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-46900	-.047 ✓	.000	ug/l	.000

$\bar{x}$ = (<0.2ugle)

*** Check Standard: 1 CK1ICB/CCB Seq: 115 12:49:45 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.040 ✓	.200	ug/l	.000

*** Sample ID: 1382211 ~~Test~~ Sheet #1 Seq: 116 12:51:52 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	-.006	ug/l	.000	-.008

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.053e) = (<0.015ug)

*** Sample ID: 1382211 Seq: 117 12:53:52 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	-.007	ug/l	.000	-.007

*** Sample ID: 1382215 Sheet #2 Seq: 118 12:56:05 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	.002	ug/l	.000	.002

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.085e) = (<0.024ug)

*** Sample ID: 1382215 Seq: 119 12:58:12 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	-.001	ug/l	.000	-.001

*** Sample ID: 1382219 Sheet #3 Seq: 120 13:00:18 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	.006	ug/l	.000	.006

$\bar{x}$ = (<0.2ugle)(1.405) = (<0.28ugle)(0.065e) = (<0.018ug)

*** Sample ID: 1382219 Seq: 121 13:02:26 22 Nov 1999 HG

	<0.2		0.1N HNO3	
Hg	.010	ug/l	.000	.010

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: 1382228 Stock BT			Seq: 122	13:04:33 22 Nov 1999 HG				
	<0.2		0.1N HNO3					
Hg	-.012	ug/l	.000	-.012				
*** Sample ID: 1382228			Seq: 123	13:06:59 22 Nov 1999 HG				
	<0.2		0.1N HNO3					
Hg	-.012	ug/l	.000	-.012				
*** Sample ID: LFB Reduct			Seq: 124	13:09:24 22 Nov 1999 HG				
			0.1N HNO2 2.0 UG/L					
Hg	1.00	ug/l	.000	1.00				
*** Sample ID: LFB 11/22/99 gtp			Seq: 125	13:11:43 22 Nov 1999 HG				
			0.1N HNO2 2.0 UG/L					
Hg	1.01	ug/l	.000	1.01				

*** Check Standard: 4 Ck4IPC/CCV Seq: 126 13:14:02 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.8	4.89 ✓	5.00	ug/l	.000

$\bar{x}$ = 4.89 ugle (98%R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 127 13:16:19 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.9	4.89 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 128 13:18:38 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-4470%	-.045 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ugle

*** Check Standard: 1 Ck1ICB/CCB Seq: 129 13:20:45 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.037 ✓	.20%	ug/l	.000

*** Sample ID: LRB KCL Seq: 130 13:22:52 22 Nov 1999 HG

	<0.2		11/19		
Hg	-.027	ug/l	.000	-.027	

$\bar{x}$ = (<0.2 ugle)(30 ml + 1.5 ml + 0.75 ml + 4.5 ml + 2.25 + 3. ml / 30 ml) = <0.28 ugle

Dilution factor (1.40)

*** Sample ID: LFB KCL Seq: 131 13:24:59 22 Nov 1999 HG

	<0.2		11/19		
Hg	-.027	ug/l	.000	-.027	

*** Sample ID: LFB KCL T.V.= Seq: 132 13:27:07 22 Nov 1999 HG

			11/19	2.00 UG/L	
Hg	1.23	ug/l	.000	1.23	

$\bar{x}$ = (1.23 ugle)(1.40) = 1.72 ugle (86%R)

*** Sample ID: LFB KCL Seq: 133 13:29:19 22 Nov 1999 HG

			11/19	2.00 UG/L	
Hg	1.77	ug/l	.000	1.77	

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13:31:37 22 Nov 1999

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

mixed replicate analysis.

*** Sample ID: 1382223 Seq: 134 13:31:37 22 Nov 1999 HG
<0.2 STACK BLK KCL
Hg -.027 ug/l .000 -.027
$\bar{x}$ = (<0.2ug/l)(1.40) = (<0.28ug/l)(0.500L) = <0.14ug

*** Sample ID: 1382223 Seq: 135 13:33:44 22 Nov 1999 HG
<0.2 STACK BLK KCL
Hg -.024 ug/l .000 -.024

*** Sample ID: 1382223 Seq: 136 13:35:51 22 Nov 1999 HG
<0.2 STACK BLK KCL
Hg -.023 ug/l .000 -.023

*** Sample ID: 1382223 Seq: 137 13:37:59 22 Nov 1999 HG
<0.2 11/22/99 gp. STACK BLK KCL
Hg -.022 ug/l .000 -.022

*** Sample ID: 1382223 MS Matrix Spike Seq: 138 13:40:06 22 Nov 1999 HG
2.00 UG/L
Hg 1.96 ug/l .000 1.96
Spk T.V. = (2.00 ug/l)(1.40) = (2.80ug/l)(0.500L) = 1.40 ug
$\bar{x}$ = (1.95ug/l)(1.40) = (2.72ug/l)(0.50L) = 1.36ug
97%R

*** Sample ID: 1382223 MS Seq: 139 13:42:15 22 Nov 1999 HG
2.00 UG/L
Hg 1.93 ug/l .000 1.93

*** Check Standard: 4 CK4ICV/CCV Seq: 140 13:44:22 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 100. 5.02 ✓ 5.00 ug/l .000
$\bar{x}$ = 4.96ug/l
99%R

*** Check Standard: 3 CK3ICV/CCV Seq: 141 13:46:41 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.1 4.90 ✓ 5.00 ug/l .000

*** Check Standard: 2 CK2ICB/CCB Seq: 142 13:48:58 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -46500 -.047 ✓ .000 ug/l .000
$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 CK1ICB/CCB Seq: 143 13:51:05 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.057 ✓ .200 ug/l .000

*** Sample ID: 1382185 Seq: 144 13:53:12 22 Nov 1999 HG
<0.2 INLET BLK KCL
Hg -.019 ug/l .000 -.019
$\bar{x}$ = (<0.2ug/l)(1.40) = (<0.28ug/l)(0.50L) = <0.14ug

*** Sample ID: 1382185 Seq: 145 13:55:22 22 Nov 1999 HG
<0.2 INLET BLK KCL
Hg -.018 ug/l .000 -.018

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

*** Sample ID: 1382158 Seq: 146 13:57:29 22 Nov 1999 HG

$\bar{x}$ = (3.29 ug/l)(1.40) = (4.61 ug/l)(0.650 L) = 2.99 ug

			KDL					
Hg	3.29	ug/l	.000	3.29				

*** Sample ID: 1382158 Seq: 147 13:59:41 22 Nov 1999 HG

			KDL					
Hg	3.28	ug/l	.000	3.28				

*** Sample ID: 1382162 Seq: 148 14:01:51 22 Nov 1999 HG

$\bar{x}$ = (2.82 ug/l)(1.40) = (3.95 ug/l)(0.690 L) = 2.72 ug

			KDL					
Hg	2.82	ug/l	.000	2.82				

*** Sample ID: 1382162 Seq: 149 14:04:04 22 Nov 1999 HG

			KDL					
Hg	2.82	ug/l	.000	2.82				

*** Sample ID: 1382166 Seq: 150 14:06:18 22 Nov 1999 HG

$\bar{x}$ = (1.55 ug/l)(1.40) = (2.17 ug/l)(0.750 L) = 1.63 ug

			KDL					
Hg	1.55	ug/l	.000	1.55				

*** Sample ID: 1382166 Seq: 151 14:08:27 22 Nov 1999 HG

			KDL					
Hg	1.54	ug/l	.000	1.54				

*** Sample ID: 1382170 Seq: 152 14:10:37 22 Nov 1999 HG

$\bar{x}$ = (<0.2 ug/l)(1.40) = (0.28 ug/l)(0.500 L) = ~~1.14 mg~~ <0.14 ug

	<0.2		KDL					
Hg	.005	ug/l	.000	.005				

*** Sample ID: 1382170 Seq: 153 14:12:46 22 Nov 1999 HG

	<0.2		KDL					
Hg	.004	ug/l	.000	.004				

*** Check Standard: 4 Ck4IPC/CCV Seq: 154 14:14:53 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	4.94 ✓	5.00 ✓	ug/l	.000

$\bar{x}$ = 4.90 ug/l (98% R)

*** Check Standard: 3 Ck3IPC/CCV Seq: 155 14:17:08 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.3	4.86 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 156 14:19:31 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-79700	-.040 ✓	.000	ug/l	.000

$\bar{x}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 157 14:21:37 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		.001 ✓	.002	ug/l	.000

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14:23:45 22 Nov 1999

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

*** Sample ID: 1382174 Seq: 158 14:23:45 22 Nov 1999 HG

			KCL	
Hg	12.4	ug/l	.000	12.4

$\bar{X}$ = (12.4 ug/l)(1.40)
= (17.4 ug/l)(0.950 l)
= 16.5 ug

*** Sample ID: 1382174 Seq: 159 14:26:10 22 Nov 1999 HG

			KCL	
Hg	12.4	ug/l	.000	12.4

*** Sample ID: 1382178 Seq: 160 14:28:36 22 Nov 1999 HG

			KCL	
Hg	9.95	ug/l	.000	9.95

$\bar{X}$ = (9.96 ug/l)(1.40)
= (13.9 ug/l)(0.900 l)
= 12.5 ug

*** Sample ID: 1382178 Seq: 161 14:30:56 22 Nov 1999 HG

			KCL	
Hg	9.97	ug/l	.000	9.97

*** Sample ID: 1382182 Seq: 162 14:33:16 22 Nov 1999 HG

			KCL	
Hg	9.13	ug/l	.000	9.13

$\bar{X}$ = (9.18 ug/l)(1.40)
= (12.9 ug/l)(0.840 l)
= 10.8 ug

1% diffuance

*** Sample ID: 1382182 Seq: 163 14:35:40 22 Nov 1999 HG

			KCL	
Hg	9.22	ug/l	.000	9.22

*** Sample ID: 1382191 Seq: 164 14:38:00 22 Nov 1999 HG

			KCL	
Hg	<0.2 .069	ug/l	.000	.069

$\bar{X}$ = (<0.2 ug/l)(1.40)
= (<0.28 ug/l)(0.550 l)
= <0.16 ug

*** Sample ID: 1382191 Seq: 165 14:40:15 22 Nov 1999 HG

			KCL	
Hg	<0.2 -.063	ug/l	.000	-.063

*** Sample ID: 1382212 Seq: 166 14:43:30 22 Nov 1999 HG

			KCL	
Hg	.755	ug/l 11/22/99 JP	.000	.755

*** Sample ID: 1382212 Seq: 167 14:45:40 22 Nov 1999 HG

			KCL	
Hg	.842	ug/l	.000	.842

$\bar{X}$ = (0.849 ug/l)(1.40)
= (1.19 ug/l)(0.695 l)
= 0.826 ug

*** Check Standard: 4 Ck4IPC/CCV Seq: 168 14:47:48 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		97.6	4.88 ✓	5.00	ug/l	.000

$\bar{X}$ = 4.85 ug/l 97%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 169 14:50:06 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
[illegible]		[illegible]	4.88 ✓	5.00	ug/l	.000

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

*** Check Standard: 2 Ck2ICB/CCB Seq: 170 14:52:27 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-43900	-.044	.000	ug/l	.000

$\bar{X}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 171 14:54:34 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		.038	.200	ug/l	.000

*** Sample ID: 1382212 Seq: 172 14:56:41 22 Nov 1999 HG

KCL

Hg	.851	ug/l	.000	.851

*** Sample ID: 1382212 Seq: 173 14:58:50 22 Nov 1999 HG

KCL

Hg	.855	ug/l	.000	.855

*** Sample ID: 1382212 MS Matrix Spk Seq: 174 15:01:00 22 Nov 1999 HG

KCL 2.00 UG/L

Hg	2.80	ug/l	.000	2.80

Spk T.V. = (2.00 ug/l)(1.40) = (2.8 ug/l)(0.695 l) = 1.95 ug

$\bar{X}$ = (2.80 ug/l)(1.40)
= (3.92 ug/l)(0.695 l) = 2.72 ug

97%R

*** Sample ID: 1382212 MS Matrix Spk Seq: 175 15:03:13 22 Nov 1999 HG

KCL 2.00 UG/L

Hg	2.80	ug/l	.000	2.80

*** Sample ID: 1382216 Seq: 176 15:05:24 22 Nov 1999 HG

KCL

Hg	.575	ug/l	.000	.575

$\bar{X}$ = (0.577 ug/l)(1.40)
= (0.808 ug/l)(0.787 l)
= 0.636 ug

*** Sample ID: 1382216 Seq: 177 15:07:34 22 Nov 1999 HG

KCL

Hg	.580	ug/l	.000	.580

*** Sample ID: 1382220 Seq: 178 15:09:43 22 Nov 1999 HG

KCL

Hg	.237	ug/l	.000	.237

$\bar{X}$ = (0.240 ug/l)(1.40)
= (0.336 ug/l)(0.800 l)
= 0.269 ug

*** Sample ID: 1382220 Seq: 179 15:11:53 22 Nov 1999 HG

KCL

Hg	.242	ug/l	.000	.242

*** Sample ID: 1382229 Seq: 180 15:14:03 22 Nov 1999 HG

<0.2

KCL

Hg	.027	ug/l	.000	.027

$\bar{X}$ = (<0.2 ug/l)(1.40)
= (<0.28 ug/l)(0.50 l)
= <0.14 ug

*** Sample ID: 1382229 Seq: 181 15:16:13 22 Nov 1999 HG

<0.2

KCL

Hg	.036	ug/l	.000	.036

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

*** Check Standard: 4 Ck4IPC/CCV Seq: 182 15:18:21 22 Nov 1999 HG
11/22/99 gpb
Line Flag %Rcv. Found True Units SD/RSD
Hg 98.7 4.94 5.00 ug/l .000

*** Check Standard: 3 Ck3IPC/CCV Seq: 183 15:20:39 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD (volume low in cup)
Hg 92.3 4.62 5.00 ug/l .000

*** Check Standard: 4 Ck4IPC/CCV Seq: 184 15:24:18 22 Nov 1999 HG Refilled
Line Flag %Rcv. Found True Units SD/RSD 96%R
Hg 95.7 4.79 ✓ 5.00 ug/l .000 $\bar{x}$ = 4.78ug/l

*** Check Standard: 3 Ck3IPC/CCV Seq: 185 15:26:35 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 95.4 4.77 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 186 15:28:54 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -44500 -.044 ✓ .000 ug/l .000 $\bar{x}$ = <0.2ug

*** Check Standard: 1 Ck1ICB/CCB Seq: 187 15:31:00 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.041 ✓ .200 ug/l .000

*** Sample ID: LRB KMNO4 Seq: 188 15:33:09 22 Nov 1999 HG
Dilution factor (1.375).
<0.2 11/19
Hg .017 ug/l .000 .017 $\bar{x}$ = (<0.2ug/l)(30ml + 1.5ml + 4.5ml + 2.25ml + 3.0ml / 30ml)
= <0.28ug/l

*** Sample ID: LRB KMNO4 Seq: 189 15:35:19 22 Nov 1999 HG
<0.2 11/19
Hg .016 ug/l .000 .016

*** Sample ID: LFB KMNO4 T.V.= Seq: 190 15:37:29 22 Nov 1999 HG
11/19 2.00 UG/L
Hg 1.34 ug/l .000 1.34 $\bar{x}$ = (1.35ug/l)(30ml + 1.5ml + 4.5ml + 2.25ml + 3.0ml / 30ml)
= 1.86ug/l 93%R

*** Sample ID: LFB KMNO4 Seq: 191 15:39:49 22 Nov 1999 HG
11/19 2.00 UG/L
Hg 1.35 ug/l .000 1.35

*** Sample ID: 1382225 Seq: 192 15:42:01 22 Nov 1999 HG
<0.2 STACK BLK 8% KMnO4 $\bar{x}$ = (<0.2ug/l)(1.375)
Hg .021 ug/l .000 .021 = (<0.28ug/l)(0.50l)
= <0.14ug

*** Sample ID: 1382225 Seq: 193 15:44:11 22 Nov 1999 HG
<0.2 STACK BLK KCl 5% KMnO4
Hg .024 ug/l .000 .024

Folder: 112299HG
Protocol: ontario

15:46:22 22 Nov 1999

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

*** Sample ID: 1382187 Seq: 194 15:46:22 22 Nov 1999 HG

INLET BLK ~~HCl~~ gp 11/22 KMnO4

Hg	<0.2 .016	ug/l	.000	.016

$\bar{X}$ = (<0.2 ug/l)(1.375)
= (<0.28 ug/l)(0.50 l)
= <0.14 ug

*** Sample ID: 1382187 Seq: 195 15:48:32 22 Nov 1999 HG

INLET BLK ~~HCl~~ 11/22 gp KMnO4

Hg	<0.2 .015	ug/l	.000	.015

*** Sample ID: 1382160 Seq: 196 15:50:43 22 Nov 1999 HG

gp ~~HCl~~ KMnO4

Hg	9.82	ug/l	.000	9.82

$\bar{X}$ = (9.87 ug/l)(1.375)
= (13.6 ug/l)(0.50 l)
= 6.79 ug

*** Sample ID: 1382160 Seq: 197 15:53:17 22 Nov 1999 HG

gp ~~HCl~~ KMnO4

Hg	9.92	ug/l	.000	9.92

*** Check Standard: 4 Ck4IPC/CCV Seq: 198 15:55:58 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		96.2	4.81 ✓	5.00	ug/l	.000

$\bar{X}$ = 4.79 ug/l 96%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 199 15:58:17 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		95.7	4.78 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 200 16:00:36 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-44200	-.044 ✓	.000	ug/l	.000

$\bar{X}$ = <0.2 ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 201 16:02:43 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.038 ✓	.200	ug/l	.000

*** Sample ID: 1382164 Seq: 202 16:04:51 22 Nov 1999 HG

11/22 gp ~~HCl~~ KMnO4

Hg	8.37	ug/l	.000	8.37

$\bar{X}$ = (8.39 ug/l)(1.375)
= (11.5 ug/l)(0.545 l)
= 6.27 ug

*** Sample ID: 1382164 Seq: 203 16:07:21 22 Nov 1999 HG

gp ~~HCl~~ KMnO4

Hg	8.41	ug/l	.000	8.41

*** Sample ID: 1382168 Seq: 204 16:09:54 22 Nov 1999 HG

gp ~~HCl~~ KMnO4

Hg	7.45	ug/l	.000	7.45

$\bar{X}$ = (7.41 ug/l)(1.375)
= (10.2 ug/l)(0.600 l)
= 6.11 ug

*** Sample ID: 1382168 Seq: 205 16:12:26 22 Nov 1999 HG

gp ~~HCl~~ KMnO4

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Folder: 112299HG
Protocol: ontario

16:15:01 22 Nov 1999

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

*** Sample ID: 1382172 Seq: 206 16:15:01 22 Nov 1999 HG
gp Kmno4
Hg <0.2 .032 ug/l .000 .032
$\bar{x}$ = ((<0.2ug/l)(1.375) = ((0.275ug/l)(0.50l) = <0.14ug

*** Sample ID: 1382172 Seq: 207 16:17:12 22 Nov 1999 HG
gp Kmno4
Hg <0.2 .039 ug/l .000 .039

*** Sample ID: 1382176 Seq: 208 16:19:23 22 Nov 1999 HG
gp Kmno4
Hg 8.51 ug/l .000 8.51
$\bar{x}$ = (8.50ug/l)(1.375) = (11.7ug/l)(0.50l) = 5.86ug

*** Sample ID: 1382176 Seq: 209 16:21:55 22 Nov 1999 HG
gp Kmno4
Hg 8.54 ug/l .000 8.54

*** Sample ID: 1382176 Seq: 210 16:24:30 22 Nov 1999 HG
gp Kmno4
Hg 8.46 ug/l .000 8.46

*** Sample ID: 1382176 Seq: 211 16:27:05 22 Nov 1999 HG
11/22/99 gp
gp Kmno4
Hg 8.55 ug/l .000 8.55

quired plicate plicates

*** Check Standard: 4 Ck4IPC/CCV Seq: 212 16:29:33 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 94.3 4.71 ✓ 5.00 ug/l .000
$\bar{x}$ = 4.69ug/l 94%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 213 16:31:51 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg 93.6 4.68 ✓ 5.00 ug/l .000

*** Check Standard: 2 Ck2ICB/CCB Seq: 214 16:34:03 22 Nov 1999 HG
Line Flag %Rcv. Found True Units SD/RSD
Hg -29700 -.050 ✓ .000 ug/l .000
$\bar{x}$ = <0.2ug/l

*** Check Standard: 1 Ck1ICB/CCB Seq: 215 16:36:09 22 Nov 1999 HG
Line Flag Found Range(+/-) Units SD/RSD
Hg -.040 ✓ .200 ug/l .000

*** Sample ID: 1382176 MS Seq: 216 16:38:18 22 Nov 1999 HG
gp Kmno4 2.00 ug/l
Hg 10.1 ug/l .000 10.1
11/22/99 gp. See pg. # 525 for reprep.

*** Sample ID: 1382176 MS Seq: 217 16:40:53 22 Nov 1999 HG
gp Kmno4 2.00 ug/l

Folder: 112299HG
Protocol: ontario

16:43:27 22 Nov 1999

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

*** Sample ID: 1382180 Seq: 218 16:43:27 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 7.70 ug/l .000 7.70

$\bar{X} = (7.67 ug/l)\left(\frac{30ml + 1.5ml + 5.0ml + 2.25ml + 3ml}{30ml}\right)$
$= (10.7 ug/l)(0.500l)$
$= 5.33 ug$

*** Sample ID: 1382180 Seq: 219 16:45:59 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 7.65 ug/l .000 7.65

*** Sample ID: 1382184 Seq: 220 16:48:34 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 6.09 ug/l .000 6.09

$\bar{X} = (6.05 ug/l)\left(\frac{30ml + 1.5ml + \cancel{5.0ml}\ 7.5ml + 2.25ml + 3ml}{30ml}\right)$
$= (8.92 ug/l)(0.500l)$
$= 4.46 ug$

*** Sample ID: 1382184 Seq: 221 16:51:06 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 6.03 ug/l .000 6.03

*** Sample ID: 1382193 Seq: 222 16:53:40 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg <0.2 .020 ug/l .000 .020

$\bar{X} = (<0.2 ug/l)(1.375)$
$= (<0.28 ug/l)(0.514l)$
$= <0.14 ug$

*** Sample ID: 1382193 Seq: 223 16:55:52 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg <0.2 .031 ug/l .000 .031

*** Sample ID: 1382214 Seq: 224 16:58:03 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 11.1 ug/l .000 11.1

$\bar{X} = (11.0 ug/l)(1.375)$
$= (15.1 ug/l)(0.50l)$
$= 7.56 ug$

*** Sample ID: 1382214 Seq: 225 17:00:38 22 Nov 1999 HG

gr ~~KCL~~ Kmnoy

Hg 10.9 ug/l .000 10.9

*** Check Standard: 4 Ck4IPC/CCV Seq: 226 17:03:18 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		94.8	4.74 ✓	5.00	ug/l	.000

$\bar{X} = 4.72 ug/l$ 94%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 227 17:05:38 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		94.3	4.71 ✓	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 228 17:08:00 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		-45800	-.046 ✓	.000	ug/l	.000

$\bar{X} = <0.2 ug/l$

*** Check Standard: 1 Ck1ICB/CCB Seq: 229 17:10:06 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
[illegible]		[illegible] ✓	[illegible]	ug/l	[illegible]

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

*** Sample ID: 1382210 Seq: 220 17:12:15 22 Nov 1999 HG
gr HCl Kmno4
Hg 10.9 ug/l .000 10.9

$\bar{X}$ = (10.8 ug/l)(1.375) = (14.9 ug/l)(0.50 l) = 7.42 ug

*** Sample ID: 1382218 Seq: 221 17:14:54 22 Nov 1999 HG
gr HCl Kmno4
Hg 10.7 ug/l .000 10.7

*** Sample ID: 1382222 Seq: 222 17:17:33 22 Nov 1999 HG
gr HCl Kmno4
Hg 10.3 ug/l .000 10.3

$\bar{X}$ = (10.3 ug/l)(1.375) = (14.2 ug/l)(0.530 l) = 7.51 ug

*** Sample ID: 1382222 Seq: 223 17:20:06 22 Nov 1999 HG
gr HCl Kmno4
Hg 10.3 ug/l .000 10.3

*** Sample ID: 1382231 Seq: 224 17:22:41 22 Nov 1999 HG
gr HCl Kmno4
Hg <0.2 .009 ug/l .000 .009

$\bar{X}$ = (<0.2 ug/l)(30 ml + 1.5 ml + 10.5 ml + 2.25 ml + 3 ml / 30 ml) = (<0.32 ug/l)(0.50 l) = <0.16 ug

*** Sample ID: 1382231 Seq: 225 17:24:54 22 Nov 1999 HG
gr HCl Kmno4
Hg <0.2 .023 ug/l .000 .023

*** Sample ID: 1382231 Seq: 226 17:27:10 22 Nov 1999 HG
gr HCl Kmno4
Hg <0.2 .021 ug/l .000 .021

*** Sample ID: 1382231 Seq: 227 17:29:23 22 Nov 1999 HG
11/22/99 gr
gr HCl Kmno4
Hg .023 ug/l .000 .023

*** Sample ID: 1382231 MS Matrix Spk Seq: 228 17:31:35 22 Nov 1999 HG
2.00 UG/L HCl Kmno4
Hg 1.70 ug/l .000 1.70

Spk T.V. = (2.00 ug/l)(1.575) = (3.15 ug/l)(0.50 l) = 1.57 ug

*** Sample ID: 1382231 MS Seq: 229 17:33:59 22 Nov 1999 HG
2.00 UG/L HCl Kmno4
Hg 1.68 ug/l .000 1.68

$\bar{X}$ = (1.69 ug/l)(1.575) = (2.66 ug/l)(0.50 l) = 1.33 ug

85%R

*** Sample ID: 1382176 MS Kmno4 Recheck Seq: 230 17:37:06 22 Nov 1999 HG
HCl 2.00 UG/L
Hg 10.1 ug/l .000 10.1

11/22/99 gr

*** Sample ID: 1382176 MS Seq: 231 17:39:47 22 Nov 1999 HG
Kmno4
HCl 2.00 UG/L
[illegible] .000 [illegible]

paired replicate analysis

Folder: 112299HG
Protocol: ontario

17:42:24 22 Nov 1999

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

*** Sample ID: 1382176 MS Reprep. Matrix Spk Seq: 242 17:42:24 22 Nov 1999 HG
~~REL~~ 2.00 UG/L
Spk T.V.= (2.00ug/L)(1.375) = (2.75ug/L)(0.50L) = 1.375ug
$\bar{x}$ = (10.6ug/L)(1.375) = (14.57ug/L)(0.50L) = 7.29ug
104 %R

Hg	10.7	ug/l	.000	10.7

*** Sample ID: 1382176 MS Kmnoy Seq: 243 17:45:04 22 Nov 1999 HG
~~REL~~ 2.00 UG/L

Hg	10.5	ug/l	.000	10.5

*** Check Standard: 4 Ck4IPC/CCV Seq: 244 17:47:40 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		93.6	4.68	5.00	ug/l	.000

$\bar{x}$ = 4.69ug/L
94%R

*** Check Standard: 3 Ck3IPC/CCV Seq: 245 17:49:55 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		93.9	4.69	5.00	ug/l	.000

*** Check Standard: 2 Ck2ICB/CCB Seq: 246 17:52:18 22 Nov 1999 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		[illegible]	-.057	.000	ug/l	.000

$\bar{x}$ = (0.2ug/L

*** Check Standard: 1 Ck1ICB/CCB Seq: 247 17:54:24 22 Nov 1999 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.042	.200	ug/l	.000

Total Elemental Mercury (Hg_E) Calculations

Total elemental mercury is the Hg present in the H_2SO_4 - $KMnO_4$ impingers and the mercury present in the HNO_3 - H_2O_2 impingers solutions. See Method, equation # 14, for calculation:

① # 1382160 ; 1382159 (outlet #1)

6.79 ug $Hg_{(KMnO_4)}$ + 0.455 ug $Hg_{H_2O_2}$

= (7.25 ug Hg_E)

② # 1382164 + 1382163 (outlet #2)

6.27 ug $Hg_{(KMnO_4)}$ + 0.572 ug $Hg_{(H_2O_2)}$

= (6.84 ug Hg_E)

③ # 1382168 + 1382167 (outlet #3)

6.11 ug $Hg_{(KMnO_4)}$ + 0.486 ug $Hg_{(H_2O_2)}$

= (6.60 ug Hg_E)

④ 1382172 + 1382171 (outlet BT)

< 0.14 ug $Hg_{(KMnO_4)}$ + < 0.17 ug $Hg_{H_2O_2}$

= (< 0.17 ug Hg_E)

⑤ 1382176 + 1382175 (Inlet #1)

5.86 ug $Hg_{(KMnO_4)}$ + 0.888 ug $Hg_{H_2O_2}$

= (6.75 ug Hg_E)

⑥ 1382180 + 1382179 (Inlet #2)

5.33 ug $Hg_{(KMnO_4)}$ + 0.834 ug $Hg_{H_2O_2}$

= (6.16 ug Hg_E)

⑦ 1382184 + 1382183 (Inlet #3)

4.46 ug $Hg_{(KMnO_4)}$ + 0.683 ug $Hg_{H_2O_2}$

= (5.14 ug Hg_E)

Elemental Hg (cont'd)

(8) 1382193 + 1382192 (Inlet BT)

<0.14 ug Hg(KMnO4) + <0.17 ug Hg H_2O_2

= <0.17 ug Hg E

(9) 1382214 + 1382213 (#1 STK)

7.56 ug Hg(KMnO4) + <0.19 ug Hg H_2O_2

= 7.56 ug Hg E

(10) 1382218 + 1382217 (#2 STK)

7.42 ug Hg(KMnO4) + <0.19 ug Hg H_2O_2

= 7.42 ug Hg E

(11) 1382222 + 1382221 (#3 STK)

7.51 ug Hg(KMnO4) + <0.17 ug Hg H_2O_2

= 7.51 ug Hg E

(12) 1382231 + 1382230 (BT-STK)

<0.16 ug Hg(KMnO4) + <0.19 ug Hg H_2O_2

= <0.19 ug Hg E

Pjs# 187900
187901

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Analyte	QCS			IPC/CCV				
	True	Found	%R	True	Found	%R	Found	%R
Mercury	5.00	4.82	96.4	5.00	5.10	102.0	5.11	102.2

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	5.09	101.8	5.05	101.0	4.98	99.6

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.93	98.6	4.93	98.6	4.91	98.2

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.96	99.2	4.90	98.0	4.85	97.0

rms 2/25/98

rms 5/20/98

Initial and Continuing Calibration Verification Continued

Lab Name: *Philip Analytical Services*

File Name: HG-112299

Analyte	IPC/CCV						
	True	Found	%R	Found	%R	Found	%R
Mercury	5.00	4.78	95.6	4.79	95.8	4.69	93.8

rms 2/25/98

rms 5/20/98

2A

Initial and Continuing Calibration Verification

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Analyte				IPC/CCV				
				True	Found	%R	Found	%R
Mercury				5.00	4.72	94.4	4.69	93.8

rms 2/25/98 rev. 1

rms 5/20/98 rev. 2

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name *Philip Analytical Services*

File Name *HG-112299*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#5		#6	c	#7	c	#8	c	#9	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

	Continuing Calibration Blanks (ug/l)									
Parameter	#10		#11	c	#12	c	#13	c	#14	c
Mercury	< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	

5/19/98 rms

Initial & Continuing Calibration Blanks

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Concentration Units: ug/l

Parameter	Initial Calibration Blank (ug/l)	c	Continuing Calibration Blanks (ug/l) #1	c	#2	c	#3	c	#4	c
Mercury	< 0.20		< 0.20							

5/19/98 rms

3A

Method Blank

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Batch: 111999 H2O2

	1382226
	Method Blank
	ug
Mercury	< 0.21

3A

Method Blank

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Batch: *111999 0.1N HNO3*

	1382227
	Method Blank
	(ug)
Mercury	< 0.084

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 KCL

	1382223
	Method Blank
	(ug)
Mercury	< 0.14

3A

Method Blank

Lab Name: *Philip Analytical Services*

File Name: *HG-112299*

Batch: 111999 KMNO4

	1382225
	Method Blank
	ug
Mercury	< 0.02

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *10% HNO3 INLET*

	1382195
	Method Blank
	(ug)
Mercury	< 0.06

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 10% HNO3 STACK

	1382232
	Method Blank
	(ug)
Mercury	< 0.04

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *111999 H2O2*

	1382188
	Method Blank
	(ug)
Mercury	< 0.28

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 0.1N HNO3

	1382189
	Method Blank
	ug
Mercury	< 0.084

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: *111999 KCL*

	1382185
	Method Blank
	(ug)
Mercury	< 0.14

3A
Method Blank

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*
Batch: 111999 KMNO4

	1382187
	Method Blank
	(ug)
Mercury	< 0.14

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 H2O2

Sample Number: *1382183*

Concentration Units:ug Hg

		Matrix Spike								
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c					
Mercury	0.684	1.68	2.20	90.0						

5/20/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 0.1N HNO3

Sample Number: *1382165*

Concentration Units: ug Hg

		MATRIX SPIKE									
	Sample	Spike	Matrix Spike								
Parameter	Conc.	Conc.	Conc.	% Recovery	c						c
Mercury	< 0.051	0.506	0.435	86.0							

5/19/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382223*

Concentration Unit: ug Hg

		MATRIX SPIKE								
	Sample	Spike	Matrix Spike							
Parameter	Conc.	Conc.	Conc.	% Recovery	c					c
Mercury	< 0.14	1.40	1.36	97.0						

5/20/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382212*

Concentration Units: ug Hg

		MATRIX SPIKE								
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c					c
Mercury	0.819	1.95	2.72	97.0						

5/19/98 rms

5B

SPIKE RECOVERY

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KMNO4

Sample Number: *1382176*

Concentration Units:ug Hg

		Matrix Spike									
Parameter	Sample Conc.	Spike Conc.	Matrix Spike Conc.	% Recovery	c						
Mercury	5.84	1.38	7.29	104.0							

5/20/98 rms

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 H2O2

Sample Number: *1382183*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	0.684	0.683	0.678	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 0.1N HNO3

Sample Number: *1382165*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.051	< 0.051	< 0.051	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382223*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	< 0.14	< 0.14	< 0.14	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KCL

Sample Number: *1382212*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	0.819	0.828	0.832	

Must be within 10 % difference

rms 5/20/1998

TRIPLICATE ANALYSIS

Lab Name: *Philip Analytical Services*

File Name: *HG-112299* Batch: 111999 KMNO4

Sample Number: *1382176*

Concentration Units: ug

Parameter	Sample Concentration	Sample Duplicate Concentration	Sample Triplicate Concentration	
Mercury	5.84	5.87	5.82	

Must be within 10 % difference

rms 5/20/1998

Metal PQLS

Lab Name: *Philip Analytical Services*
File Name: *HG-112299*

Element	Water PQL (ug/l)	Soil PQL (ug/g)
Mercury	< 0.20	< 0.04

PQLs
rms 5/21/98

APPENDIX E
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS FOR FLOW, MOISTURE AND ISO

Client: TEC - Polk Power Station	Plant: Tampa, FL
Test Number: Run 1	Test Date: 11/2/99
Test Location: Unit No. 1 Stack	Test Period: 0755-1043

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{\text{delta H}}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 0.9961 \times 77.926 \times \left(29.53 + \frac{1.501}{13.6} \right)}{79.52 + 460} = 75.224$$

Where:

Vm(std) =	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Vm =	Volume of gas sample measured by the dry gas meter at meter conditions, dcf.
Pb =	Barometric Pressure, in Hg.
delt H =	Average pressure drop across the orifice meter, in H_2O
Tm =	Average dry gas meter temperature , deg F.
Y =	Dry gas meter calibration factor.
17.64 =	Factor that includes ratio of standard temperature (528 deg R) to standard pressure (29.92 in. Hg), deg R/in. Hg.
13.6 =	Specific gravity of mercury.

2. Volume of water vapor in the gas sample corrected to standard conditions, scf.

Vw(std) = (0.04707 x Vwc) + (0.04715 x Wwsg)

Vw(std) = (0.04707 x 106.0) + (0.04715 x 16.9) = 5.8

Where:

Vw(std) =	Volume of water vapor in the gas sample corrected to standard conditions, scf.
Vwc =	Volume of liquid condensed in impingers, ml.
Wwsg =	Weight of water vapor collected in silica gel, g.
0.04707 =	Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.
0.04715 =	Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{5.786}{5.786 + 75.224} = 0.071$$

Where:

bws =	Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

Md = 1 - bws

Md = 1 - 0.071 = 0.929

Where:

Md = Mole fraction of dry gas, dimensionless.

5. Dry molecular weight of gas stream, lb/lb-mole.

$MWd = (0.440 \times \%CO_2) + (0.320 \times \%O_2) + (0.280 \times (\%N_2 + \%CO))$

$MWd = (0.440 \times 8.1) + (0.320 \times 12.2) + (0.280 \times (79.7 + 0.00))$

$= 29.78$

Where:

MWd =	Dry molecular weight , lb/lb-mole.
%CO2 =	Percent carbon dioxide by volume, dry basis.
$\%O_2$ =	Percent oxygen by volume, dry basis.
$\%N_2$ =	Percent nitrogen by volume, dry basis.
%CO =	Percent carbon monoxide by volume, dry basis.
0.440 =	Molecular weight of carbon dioxide, divided by 100.
0.320 =	Molecular weight of oxygen, divided by 100.
0.280 =	Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

MWs = (MWd x Md) + (18 x (1 - Md))

MWs = (29.78 x 0.929) +(18 (1 - 0.929)) = 28.94

Where:

MWs =	Molecular weight of wet gas, lb/lb-mole.
18 =	Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 1.179314 \times \left(\frac{800}{29.46 \times 28.94} \right)^{1/2} = 82.0$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec x $\frac{(lb/lb\text{-}mole)(in.\ Hg)^{1/2}}{(deg\ R)(in\ H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = Pb + $\frac{P(static)}{13.6}$

delt p = Velocity head of stack, in. H_2O

8. Average gas stream volumetric flowrate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 82.03 \times 283.53 = 1395491$$

Where:

Qs(act) = Volumetric flowrate of wet stack gas at actual conditions, wacf/min.

As = Cross-sectional area of stack, ft^2.

60 = Conversion factor from seconds to minutes.

9. Average gas stream dry volumetric flowrate at standard conditions, dscf/min.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.929 \times \frac{29.46}{800} \times 1395491$$

$$= 841784$$

Where:

Qs(std) = Volumetric flowrate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 800 \times 75.224}{82.03 \times 120 \times 29.46 \times 0.929 \times (0.196)^{\wedge}2} = 100.8$$

Where:

I = Percent of isokinetic sampling.

O = Total sampling time, minutes.

Dn = Diameter of nozzle, inches.

17.327 = Factor which includes standard temperature (528 deg R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $D^{2/4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100),

$$\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$$

SAMPLE CALCULATIONS FOR MERCURY

Client: TEC - Polk Power Station
Test Number: Run 1
Test Location: Unit No. 1 Stack

Plant: Tampa, FL
Test Date: 11/2/99
Test Period: 0755-1043

1. Total Mercury concentration, lb/dscf.

$$C_1 = \frac{W \times 2.2046 \times 10E\text{-}9}{Vm_{(std)}}$$

$$C_1 = \frac{8.41 \times 2.2046 \times 10E\text{-}9}{75.224}$$

$$= 2.46E\text{-}10$$

Where:

W = Weight of Total Mercury collected in sample in ug.
C_1 = Total Mercury concentration, lb/dscf.
2.2046×10^{-9} = Conversion factor from ug to pounds.

2. Total Mercury concentration, ug/dscm

$$C_2 = \frac{W}{Vm_{(std)} \times 0.02832}$$

$$C_2 = \frac{8.41}{75.224 \times 0.02832}$$

$$= 3.95$$

Where:

C_2 = Total Mercury concentration, µg/dscm.
W = Total Mercury catch, µg.
0.02832 = Conversion factor from cubic feet to cubic meters.

3. Total Mercury concentration, ug/Nm3

$$C_3 = \frac{W}{Vm_{(std)} \times 0.02832 \times (16.44/17.64)}$$

$$C_3 = \frac{8.41}{75.224 \times 0.02832 \times (16.44/17.64)}$$

$$C_3 = 4.24$$

Where:

C_3	=	Total Mercury concentration, ug/Nm^3
W	=	Total Mercury catch, µg.
0.02832	=	Conversion factor from cubic feet to cubic meters.
16.44/17.64	=	Ratio of conversion factors for standard temperature and pressure and normal temperature.

4. Total Mercury mass emission rate, lbs/hr.

MR1 = C_1 x Qs(std) x 60

MR1 = 2.46E-10 x 841784 x 60

MR1 = 1.24E-02

Where:

MR1	=	Total Mercury mass emission rate, lbs/hr.
60	=	Conversion factor from minutes to hours.

5. Total Mercury mass emission rate, lbs/10E+12 Btu.

MR2 = MR1/Heat Input

MR2 = 1.24E-02 / 2,408

MR2 = 5.17

Where:

MR2	=	Total Mercury mass emission rate, lbs/10E+12 Btu.
Heat Input	=	2,408 x 10E+6 Btu/hr

APPENDIX F
EQUIPMENT CALIBRATION RECORDS

WESTON

LONG/PRE DRY GAS METER CALIBRATION DATA FORM

Calibrator P. Mack
Date 9/27/99
Meter Box Number 15
Plant pm
Barometric pressure, P_b = 29.63 in. Hg
Dry Gas Meter Number ~~13[illegible]5~~ 1348735
Comments

Setting	Gas volume		Temperatures						
Orifice manometer	Wet test meter	Dry gas meter	Wet test meter	Dry gas meter					
(Δ H) in. H_2O	(V_w) ft³	(V_d) ft³	(t_w) °F	Inlet (td_i) °F	Outlet (td_o) °F	Avg (t_d) °F	Time (θ), min	Y_i	ΔH @$_i$ in. H_2O
0.5	5	302.253 297.222	71.5	78,72,79	76,76,77	77.5	13.0	1.004	1.8914
1.0	5	307.329 302.253	71.5	79,80,81	76,77,77	78.5	9.4	.9955	1.9836
1.5	10	317.504 307.329	71.5	81,83,84	78,78,79	80.5	15.8	.9957	2.0938
2.0	10	327.721 317.504	71.5	83,84,86	79,79,80	82	13.8	.9932	2.1238
3.0	10	337.990 327.721	71.5	86,91,92	80,81,82	85.5	11.2	.9921	2.0849
							Avg	Y .9961	ΔH @ 2.0355

If there is only one thermometer on the dry gas meter, record the temperature under td_o.

(ΔH) in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H@i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\Theta}{V_w}\right]^2$
0.5	0.0368	$\frac{(5)(29.63)(77.5+460)}{(5.031)(29.63+.0368)(71.5+460)}$	$\frac{(.0317)(.5)}{(29.63)(77.5+460)} \left[\frac{(71.5+460)(13.0)}{5}\right]^2$
1.0	0.0735	$\frac{(5)(29.63)(78.5+460)}{(5.076)(29.63+.0735)(71.5+460)}$	$\frac{(.0317)(1.0)}{(29.63)(78.5+460)} \left[\frac{(71.5+460)(9.4)}{5}\right]^2$
1.5	0.110	$\frac{(10)(29.63)(80.5+460)}{(10.175)(29.63+.110)(71.5+460)}$	$\frac{(.0317)(1.5)}{(29.63)(80.5+460)} \left[\frac{(71.5+460)(15.8)}{10}\right]^2$
2.0	0.147	$\frac{(10)(29.63)(82+460)}{(10.217)(29.63+.147)(71.5+460)}$	$\frac{(.0317)(2.0)}{(29.63)(82+460)} \left[\frac{(71.5+460)(13.8)}{10}\right]^2$
3.0	0.221	$\frac{(10)(29.63)(85.5+460)}{(10.269)(29.63+.221)(71.5+460)}$	$\frac{(.0317)(3.0)}{(29.63)(85.5+460)} \left[\frac{(71.5+460)(11.2)}{10}\right]^2$

WESTON

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

DATE 7/24/99
AMBIENT TEMPERATURE 72
CALIBRATION Ok, P. [illegible]

POTENTIOMETER NUMBER 2010 #15
BAROMETRIC PRESSURE 29.27
REFERENCE: THERMOCOUPLE SIMULATOR (ACCURACY ± 1°F)

REFERENCE TEMPERATURE °C	°F	TEMPERATURE READING FROM THERMOCOUPLE CHANNEL INPUT NUMBER 1	2	3	4	5	AVERAGE TEMPERATURE READING ①	TEMPERATURE DIFFERENCE ② (%)
0	32	31	31	31	31	31	31	1° - .20%
100	212	212	212	212	212	212	212	0° - 0%
500	932	933	933	933	933	933	933	1° - ~~[illegible]~~ .07%
1000	1832	1830	1830	1830	1830	1830	1830	2° - .09%

COMMENTS

① AVERAGE TEMPERATURE READING = MEAN OF THE TEMPERATURE READINGS FOR THE THERMOCOUPLE CHANNELS

② THE CHANNEL READINGS MUST AGREE WITHIN ± 5°F OR 3°C

ACCEPTABLE TEMPERATURE DIFFERNCE ≤ 1.5 = $\left(\frac{(\text{REF TEMP}^{\circ}\text{F} + 460) - (\text{TEST TEMP}^{\circ}\text{F} + 460)}{(\text{REF TEMP}^{\circ}\text{F} + 460)}\right) \times 100$

Y Factor Calibration Check Calculation

Box 15 Post Test

MWd	= Dry molecular weight source gas, lb/lb-mole.	
0.32	= Molecular weight of oxygen, divided by 100.	
0.44	= Molecular weight of carbon dioxide, divided by 100.	
0.28	= Molecular weight of nitrogen or carbon monoxide, divided by 100.	
% CO_2	= Percent carbon dioxide by volume, dry basis.	8.3
% O_2	= Percent oxygen by volume, dry basis.	11.9

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 11.9) + (0.44 * 8.3) + (0.28 * (100 - (8.3 + 11.9)))$$

$$MWd = (3.81) + (3.65) + (22.34)$$

MWd = 29.80

Tma	= Source Temperature, absolute(°R)	
Tm	= Average dry gas meter temperature , deg F.	75

Tma = Ts + 460

Tma = 75 + 460

Tma = 535

Ps	= Absolute meter pressure, inches Hg.	
13.6	= Specific gravity of mercury.	
delta H	= Avg pressure drop across the orifice meter during sampling, in H2O	1.44
Pb	= Barometric Pressure, in Hg.	29.53

Pm = Pb + (delta H / 13.6)

Pm = 29.53 + (1.44 / 13.6)

Pm = 29.64

Yqa	= dry gas meter calibration check value, dimensionless.	
0.0319	= (29.92/528)(0.75)2 (in. Hg/°/R) cfm2.	
29	= dry molecular weight of air, lb/lb-mole.	
Vm	= Volume of gas sample measured by the dry gas meter at meter conditions, dcf.	76.76
Y	= Dry gas meter calibration factor (based on full calibration)	0.9961
Delta H@	= Dry Gas meter orifice calibration coefficient, in. H2O.	2.035
avg√Delta H	= Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.2
O	= Total sampling time, minutes.	120

$$Yqa = (O / Vm) * \sqrt{ (0.0319 * Tma * 29) / (Delta H@ * Pm * MWd) } * avg\sqrt{ Delta H }$$

$$Yqa = (120 / 76.76) \sqrt{ (0.0319 * 535 * 29) / (2.035 * 29.64 * 29.804) } * 1.2$$

$$Yqa = 1.563 \sqrt{ 494.929 / 1,797.700 } * 1.2$$

Yqa = 0.984

Diff	= Absolute difference between Yqa and Y	

Diff = ((Y - Yqa) / Y) * 100

Diff = ((0.9961 - 0.984) / 0.9961) * 100

Diff = 1.21

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PITOT TUBE IDENTIFICATION NUMBER: P1/2

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE ASSEMBLY LEVEL? ✓ (YES) _____ (NO)

PITOT TUBE OPENINGS DAMAGED? _____ (YES-EXPLAIN BELOW) ✓ (NO)

α_1 = 1° (<10) α_2 = 1° (<10)

β_1 = 0° (<5) β_2 = 0° (<5)

γ = 1° θ = 2° A = .95 in.

z = A sin γ = .02 in.; (<1/8 in.),

w = A sin θ = .03 in.; (<1/32 in.),

P_a = .475 in. P_b = .475 in.

D_t = .378 in. $P_a = P_b$? ✓ (YES) _____ (NO)

COMMENTS _____

CALIBRATION REQUIRED? _____ (YES) ✓ (NO)

INSPECTOR Tom Burke DATE 12-22-94

WESTON

PITOT TUBE IDENTIFICATION NUMBER: P-300

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE ASSEMBLY LEVEL? ✓ (YES) ____ (NO)

PITOT TUBE OPENINGS DAMAGED? ____ (YES-EXPLAIN BELOW) ✓ (NO)

α_1 = 3 ° (< 10) α_2 = 2 ° (< 10)

β_1 = 1 ° (< 5) β_2 = 1 ° (< 5)

γ = 0 ° θ = 0 A = .94 in.

$A \sin\gamma$ = 0 in.; (< 1/8 in.)

$w = A \sin\theta$ = 0 in.; (< 1/32 in.).

P_1 .47 in P_2 = .47 in.

D_1 = .58 in. $P_a = P_b$? ✓ (YES) ____ (NO)

COMMENTS 17 inch head

CALIBRATION REQUIRED? ____ (YES) ✓ (NO)

[illegible] [signature] DATE 2-10-99

WESTON

TUBE IDENTIFICATION NUMBER: 302

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE ASSEMBLY LEVEL? ✓ (YES) ____ (NO)

PITOT TUBE OPENINGS DAMAGED? ____ (YES-EXPLAIN BELOW) ✓ (NO)

α_1 = 0° (< 10) α_2 = 0° (< 10)

β_1 = 0 (< 5) β_2 = 0° (< 5)

γ = 1° θ = 0 A = .93 in.

α = .01 in. (< 1/8 in.)

w = A sin θ = 0 in. (< 1/32 in.)

P_a = .465 in. P_b = .465 in.

P_c = .38 in. $P_a = P_b$? ____ (YES) ____ (NO)

COMMENTS 18 in head

CALIBRATION REQUIRED? ____ (YES) ✓ (NO)

[signature] DATE 2/10/99

WESTON

NOZZLE CALIBRATION DATA FORM

Date 11/1/99 Calibrated by Mills

Nozzle Identification Number	Nozzle Diameter, Inches[1]			ΔD,[2]	D_{avg}[3]
	D_1	D_2	D_3		
Borosilicate 196	.195	.196	.196	.001	.196
	.191	.192	.190	.002	.191

Where:

[1] $D_{1,2,3}$ = Three different nozzle diameters, inches; each diameter must be measured to nearest 0.001 in.

[2] ΔD = Maximum difference between any two diameters, inches. ΔD must be $\leq$0.004 in.

[3] D_{avg} = Nozzle diameter = average of D_1, D_2, and D_3.

nozzle.frm

APPENDIX G
TECHNICAL SYSTEM AUDIT

PROCEDURAL CHECKLIST
FOR EPA METHODS 1, 2, 3 AND 4

METHOD 1 DETERMINATIONS

Date 11/1/99 Time _____ Operator Jobin Pathapilli / Paul Green Observer Mills

Stack diameter properly determined? yes
Distance to nearest upstream disturbance properly determined? yes

Number of stack diameters? ~1

Distance of nearest downstream disturbance properly determined? yes

Number of sampling points properly selected? yes
Points properly marked on pitot tube? yes
Verification of cyclonic flow acceptable? yes

METHOD 2 SAMPLING

Date 11/1/99 Time _____ Operator Jobin P / Paul Green Observer Mills

Equipment identity matches pretest calibration list? yes

Pitot tube, lines, and manometer assembled correctly? yes

Pitot tube and components mounted interference-free manner? yes
Differential pressure gauge has correct sensitivity? yes

Differential pressure gauge leveled and zeroed? yes

Pretest leak check? yes Cyclonic flow checked? yes
Orientation of pitot tube correct during traverse? yes
Sampling port adequately sealed around pitot tube? yes
Process operating at correct conditions? yes
Stable reading taken at each traverse point? yes
Static pressure measured? yes Method used? Rotate pitot perpendicular to flow and remove leg
Moisture content determined? yes Method used? Method 4
Orsat samples taken? yes If not, explain why: _____

Post-test leak-check performed? yes Leak check results: yes
Data recorded properly? yes Calculations correct? yes

PROCEDURAL CHECKLIST FOR EPA METHODS 1, 2, 3 AND 4

METHOD 3 SAMPLING

Date 11/2/99 Time _____ Operator John P. / Matt Green Observer Mills

Method: Single-point grab _____ Single-point integrated _____
Multi-point integrated yes
Is a filter used to remove particulate matter? NO
Sampling train leak checked? yes
Sampling train purged with stack gas prior to collecting the sample? yes

Sampling port properly sealed? yes

Sampling rate held constant? yes

METHOD 3 ANALYSIS

Molecular weight determination by Orsat: yes

Reagents at the proper level? yes Analyzer level? yes
Analyzer leak checked? yes Analyzed within 8 hours? yes (immediately following Test)
Sample line purged? yes Complete absorption of gases? yes
The analysis repeated until following analysis criteria met? yes

CO_2 - Any three analyses differ by:

a. ≤ 0.3% when CO_2 ≥ 4.0% NO

b. ≤ 0.2% when CO_2 ≤ 4.0% NOT Applicable

O_2 - Any three analyses differ by:

a. ≤ 0.3% when O_2 ≥ 15.0% NOT Applicable

b. ≤ 0.2% when O_2 ≤ 14.0% NO

All readings averaged and reported to nearest 0.1% yes

PROCEDURAL CHECKLIST
FOR EPA METHODS 1, 2, 3 AND 4

METHOD 4 SAMPLING

Date 11/1/99 Time _____ Operator John P Paul Green Observer Mills

Method conducted in conjunction with pollutant emission test? No - Preliminary
Impingers properly placed? yes

Impinger contents: 1st 100 ml Dwater 2nd 100 ml Dwater 3rd empty
4th 300g Silica Gel 5th _____ 6th _____
Modifications? None
Cooling System: Crushed ice yes Other _____
Sampling time per point Single point Number of points 1

Probe heater on? NO Temperature _____ Stable? _____
Filter heater on? NO Temperature _____ Stable? _____

Crushed ice in ice bath around impingers? yes
Pretest leak check conducted? yes Leakage rate? .006 @ 10
Sampling rate constant? yes Isokinetic sampling? NO
All data recorded properly? yes
Post-leak check conducted? yes Leakage rate? .006 @ 10
Analysis - Impinger Contents:
Method: Volumetric 226
Glassware cleaned following protocol for concurrent emission test? Use separate glassware
Gravimetric? Silica Gel Trip balance calibrated? yes for Formal Test

Measurement of silica gel? yes Balance? yes
Color of silica gel? 1/2 Blue Condition? _____
All analytical data recorded properly? yes

All readings averaged and reported to nearest 0.1%

TECHNICAL SYSTEM AUDIT CHECKLIST
~~TRACE~~ METALS SAMPLING

Ontario Hydro Mercury

Date 11/2/99 Time _____ Operator John P Paul Green Observer Mills

Equipment Setup

Equipment identity matches pretest calibration list? yes

Probe nozzle: _____ Glass yes

Button-hook yes Elbow _____ Size 0.196

Cleaned according to sampling protocol? yes

Probe Liner: Borosilicate yes Quartz _____ Other _____

Cleaned according to sampling protocol? yes

Probe heating system: yes

Checked? yes Temperature ~250°F Stable? yes

Pitot Tube: Type S yes Other _____

Properly attached to probe (no interference to nozzle)? yes

Modifications: _____

Pitot tube coefficient 0.84

Differential Pressure Gauge: Inclined manometers yes

Magnehelics _____ Ranges 0-10"

Cylone (inlet only): Borosilicate Glass DID NOT USE Cyclone Other _____

Cleaned according to sampling protocol? _____

Instack Thimble ~~Filter~~ Holder: Borosilicate Glass yes Other _____

Frit material: Borosilicate Glass NO FRITT Stainless _____

Teflon _____ Other _____

Gasket Material: Silicone NO Gasket Material Other all Ground Glass joints

Cleaned according to sampling protocol? yes

Filter Type(s): QUARTZ Thimbles

Impinger train: Number of impingers 8

Cleaned according to sampling protocol? yes

Contents: 1st - 3 100 ml bcl ~~2nd~~ 4TH - 5% HNO3 10% H2O2 ~~3rd~~ Solution

~~4th~~ 5th-7th 4% KMnO4 / 10% H2SO4 ~~5th~~ Solution ~~6th~~ - Silica Gel

Impinger Weights recorded? yes

Cooling System ice Bath

Proper connections? yes - all Borosilicate Glass

Modifications _____

Silica Gel: Type 8 mesh Color Indicating New? NO Used? yes

Barometer: Mercury _____ Aneroid _____ Other Electronic

Gas Density Determination: Temperature sensor yes

Pressure gauge Manometer + Pitot

Temperature sensor properly attached to probe? yes

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TECHNICAL SYSTEM AUDIT CHECKLIST
TRACE METALS SAMPLING

Date 11/2/99 Time _____ Operator Kevin P / Paul Green Observer Mills

Test Procedures

Recent Calibrations: Pitot tubes yes
Meter Box yes Thermocouples/thermometers yes
Thimble ~~Filters~~ checked visually for irregularities? yes
Filters properly centered? not applicable Labeled? yes
Nozzle size properly selected? yes
All openings of sampling train plugged (pre-test and post-test) yes
Impingers properly assembled? yes
Pitot lines checked for leaks and plugging? yes
Meter box leveled? yes Manometers zeroed? yes
Delta H from most recent calibration yes
Nomograph setup correctly? VSD calculator K factor 1.08
Pretest leak check conducted? yes Leakage rate? .008@15
Care taken to avoid scraping port of stack wall? yes
Effective seal around probe when in-stack? yes
Probe moved to traverse points at proper time? yes
Leak check conducted during port change? Before yes After? yes
Nozzle and pitot tubes kept parallel to stack at all times? yes
Thimble ~~Filter~~(s) changed during run? NO
Any particulate lost during filter change? NO
Data forms completed and data recorded properly? yes
calculator ~~Nomograph~~ setting changed with significant change in the stack temperature? yes
Velocity pressure and orifice pressure recorded accurately? yes
Post-test leak check conducted? yes Leakage rate 0.005@11
at inches of mercury _____
Orsat analysis? yes Stack _____ Integrated yes
Approximate stack temperature 340 °F Gas sample volume ~78 FT³
Percent isokinetic calculated yes

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TECHNICAL SYSTEM AUDIT CHECKLIST
TRACE METALS SAMPLING

Date 11/2/94 Time _____ Operator Mills Observer _____

Sample Recovery

Brushes: Nylon bristle NO Other Teflon
Cleaned according to sampling protocol? yes
Wash Bottles: Glass NO Polyethylene NO Other Teflon
Cleaned according to sampling protocol? yes
Storage containers: Borosilicate glass yes Other _____
Cleaned according to sampling protocol? yes
Cap material Teflon Leak free? yes
Petri dishes: Borosilicate glass NO Petri Dishes Other Borosilicate Bottles
Cleaned according to sampling protocol? yes
Graduated cylinder: Borosilicate glass yes Other _____
Subdivisions of graduated cylinder ≤ 2 ml? yes
Cleaned according to sampling protocol? yes
Balance type Electronic Calibrated? yes
Probe allowed to cool sufficiently? yes
Probe and sample train openings covered? yes
Clean-up area(s) used Trailer
Silica gel: Color? 1/2 Blue Condition? Good
Probe handling: Acetone rinse NO 0.1 N Nitric rinse yes
~~Particulate~~ recovery: Probe nozzle yes ~~Probe fitting~~ Thimble Holder - yes
Probe liner yes ~~Front half of filter holder~~ _____
Blanks collected: Reagent(s) All required for Ontario Hydro Method (OHM)
0.1 N Nitric _____ ~~Acetone~~ _____
Impinger rinses: 0.1 N Nitric yes Other rinses yes required by OHM method
Recovery efficiency samples collected from this train? NO
Sample numbers: _____
Samples labeled and stored properly? yes
Liquid levels marked? yes
Filter handling: tweezers used? _____ Surgical gloves? yes
Any particulate lost? NO
NOTE: The above TSA would also be applied to the EPA Method 12 test train. Modified for OHM Mercury Method

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