Appendix A

Results and Calculations

Scrubber Inlet

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW, TM

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Inlet

DATA ENTRY	SYMBOL	UNITS	DATA	DATA
RUN NUMBER			SI-Run2	SI-Run3
TEST DATE		m/d/y	10/13/99	10/13/99
RUN TIME: Start		hh:mm	11:47	17:15
End		hh:mm	15:20	20:57
ROUND STACK, DIAMETER	ds	inches		
RECTANGULAR STACK, LENGTH	L	inches	288.00	288.00
WIDTH	W	inches	602.00	602.00
NOZZLE DIAMETER	dn	inches	0.2550	0.2552
AVERAGE STACK TEMPERATURE	Fs	degrees F	304.6	305.1
AVERAGE METER TEMPERATURE	Fm	degrees F	69.1	80.1
STANDARD TEMPERATURE(68 (EPA),60 (AQMD))	Tstd	degrees F	68.0	68.0
BAROMETRIC PRESSURE	Pbar	in. Hg	29.70	29.70
STACK STATIC PRESSURE	Pg	in. H20	3.50	3.50
AVG DELTA H	dH	in. H20	1.270	1.595
AVG VELOCITY HEAD	dP	in. H20	0.456	0.573
PITOT COEFFICIENT	Cp	-	0.8400	0.8400
GAS SAMPLE VOLUME	Vm	cubic ft.	75.153	85.438
METER CALIBRATION FACTOR	Y	-	1.0062	1.0062
TOTAL SAMPLING TIME	min	minutes	125.0	125.0
STACK GAS OXYGEN CONTENT	Co2,m	%	4.5	4.4
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	14.6	14.7
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	123.0	128.4
PARTICULATE BOUND MERCURY CATCH	PHg	ug	< 0.040	< 0.040
OXIDIZED MERCURY	OHg	ug	1.973	2.473
ELEMENTAL MERCURY CATCH	EHg	ug	0.376	0.523

CALCULATED DATA	SYMBOL	UNITS	DATA	DATA
RUN NUMBER			SI-Run2	SI-Run3
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.0511	0.0511
STACK AREA, As = 3.14*(ds)**2/576 (ROUND)	As	sq. feet	0.00	0.00
= L * W/144 (RECTANGULAR)			1204.00	1204.00
STANDARD TEMPERATURE(528 (EPA),520 (AQMD))	Tstdr	degrees R	528.0	528.0
AVG STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	764.6	765.1
AVG METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	529.1	540.1
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	75.109	83.714
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528)*Ww	VwStd	cubic ft.	5.790	6.044
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.072	0.067
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m) + 0.44(Cco2,m) + 0.28[100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	30.52	30.53
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws) + 18.0(Bws)	Mw	g/g-mole	29.62	29.68
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.96	29.96
STACK GAS VELOCITY				
vs = 85.49 Cp * sqrt[(dP* Ts)/(Ps*Mw)] *	vs	ft/s	45.02	50.40
vsm = 0.3048 * vs	vsm	m/s	13.72	15.36
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	3,252,488	3,641,074
DRY GAS STACK FLOW RATE (DRY,STP)				
Qsd = 17.64 (Tstdr/528)*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	2,087,126	2,345,420
Qsdm = Qsd/35.31	Qsdm	dscm/min	59,109	66,424
ISOKINETIC RATE, I = 13.61* Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	97.769	96.854

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: [illegible]

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Inlet

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)				
Cphg = 0.00001543 PHg/VmStd	Cphg	gr/dscf	< 8.22E-9	< 7.37E-9
Cpghm = 35.31 * PHg/ VmStd	Cphgm	ug/dscm	< 0.019	< 0.017
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)				
Cohg = 0.00001543 OHg/VmStd	Cohg	gr/dscf	4.05E-07	4.56E-07
Cohgm = 35.31 * OHg / VmStd	Cohgm	ug/dscm	9.28E-1	1.04E+0
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)				
Cehg = 0.00001543 EHg/VmStd	Cehg	gr/dscf	7.72E-08	9.64E-08
Cehgm = 35.31 * EHg / VmStd	Cehgm	ug/dscm	0.18	0.22
CONCENTRATION OF TOTAL MERCURY (DRY, STP)				
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	4.91E-07	5.60E-07
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**1.12**	**1.28**
EMISSION RATE OF PARTICLE BOUND MERCURY				
Mphg = Mphgm/0.4536	Mphg	lb/hr	< 1.47E-4	< 1.48E-4
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	< 6.67E-5	< 6.72E-5
EMISSION RATE OF OXIDIZED MERCURY				
Mohg = Mohgm/0.4536	Mogh	lb/hr	0.0073	0.0092
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	0.0033	0.0042
EMISSION RATE OF ELEMENTAL MERCURY				
Mehg = Mehgm/0.4536	Mehg	lb/hr	0.0014	0.0019
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	0.0006	0.0009
EMISSION RATE OF TOTAL MERCURY				
Mthg = Mthgm/0.4536	Mthg	lb/hr	**0.0088**	**0.0113**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0040	0.0051

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW, TM

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Outlet

DATA ENTRY	SYMBOL	UNITS	DATA	DATA
RUN NUMBER			SI-Run2	SI-Run3
TEST DATE		m/d/y	10/13/99	10/13/99
RUN TIME: Start		hh:mm	11:47	17:15
End		hh:mm	15:20	20:57
ROUND STACK, DIAMETER	ds	inches		
RECTANGULAR STACK, LENGTH	L	inches	288.00	288.00
WIDTH	W	inches	602.00	602.00
NOZZLE DIAMETER	dn	inches	0.2550	0.2552
AVERAGE STACK TEMPERATURE	Fs	degrees F	304.6	305.1
AVERAGE METER TEMPERATURE	Fm	degrees F	69.1	80.1
STANDARD TEMPERATURE(68°(EPA),60°(AQMD))	Tstd	degrees F	68.0	68.0
BAROMETRIC PRESSURE	Pbar	in. Hg	29.70	29.70
STACK STATIC PRESSURE	Pg	in. H20	3.50	3.50
AVG. DELTA H	dH	in. H20	1.270	1.595
AVG. VELOCITY HEAD	dP	in. H20	0.456	0.573
PITOT COEFFICIENT	Cp	-	0.8400	0.8400
GAS SAMPLE VOLUME	Vm	cubic ft.	75.153	85.438
METER CALIBRATION FACTOR	Y	-	1.0062	1.0062
TOTAL SAMPLING TIME	min	minutes	125.0	125.0
STACK GAS OXYGEN CONTENT	Co2,m	%	4.5	4.4
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	14.6	14.7
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	123.0	128.4
PARTICLE BOUND MERCURY CATCH	PHg	ug	< 0.040	< 0.040
OXIDIZED MERCURY	OHg	ug	1.973	2.473
ELEMENTAL MERCURY CATCH	EHg	ug	0.376	0.523

CALCULATED DATA	SYMBOL	UNITS	DATA	DATA
RUN NUMBER			SI-Run2	SI-Run3
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.0511	0.0511
STACK AREA, As = 3.14*(ds)**2/576 (ROUND)	As	sq. feet	0.00	0.00
= L * W/144 (RECTANGULAR)			1204.00	1204.00
STANDARD TEMPERATURE(528°(EPA),520°(AQMD))	Tstdr	degrees R	528.0	528.0
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	764.6	765.1
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	529.1	540.1
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	75.109	83.714
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528)*Ww	VwStd	cubic ft.	5.790	6.044
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.072	0.067
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m) + 0.44(Cco2,m) + 0.28[100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	30.52	30.53
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws) + 18.0(Bws)	Mw	g/g-mole	29.62	29.68
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.96	29.96
STACK GAS VELOCITY				
vs = 85.49 Cp [sqrt[(dP*Ts)/(Ps*Mw)]]	vs	ft/s	45.02	50.40
vsm = 0.3048 * vs	vsm	m/s	13.72	15.36
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	3,252,488	3,641,074
DRY GAS STACK FLOW RATE (DRY,STP)				
Qsd = 17.64 (Tstdr/528)*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	**1,950,000**	**1,960,000**
Qsdm = Qsd/35.31	Qsdm	dscm/min	55,225	55,508
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	97.769	96.854

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: [illegible]

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Outlet

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)				
Cphg = 0.00001543 PHg/VmStd	Cphg	gr/dscf	< 8.22E-9	< 7.37E-9
Cpghm = 35.31 * PHg/ VmStd	Cphgm	ug/dscm	< 0.019	< 0.017
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)				
Cohg = 0.00001543 OHg/VmStd	Cohg	gr/dscf	4.05E-07	4.56E-07
Cohgm = 35.31 * OHg / VmStd	Cohgm	ug/dscm	9.28E-1	1.04E-0
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)				
Cehg = 0.00001543 EHg/VmStd	Cehg	gr/dscf	7.72E-08	9.64E-08
Cehgm = 35.31 * EHg / VmStd	Cehgm	ug/dscm	0.18	0.22
CONCENTRATION OF TOTAL MERCURY (DRY, STP)				
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	4.91E-07	5.60E-07
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**1.12**	**1.28**
EMISSION RATE OF PARTICLE BOUND MERCURY				
Mphg = Mphgm/0.4536	Mphg	lb/hr	< 1.37E-4	< 1.24E-4
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	< 6.23E-5	< 5.62E-5
EMISSION RATE OF OXIDIZED MERCURY				
Mohg = Mohgm/0.4536	Mogh	lb/hr	0.0068	0.0077
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	0.0031	0.0035
EMISSION RATE OF ELEMENTAL MERCURY				
Mehg = Mehgm/0.4536	Mehg	lb/hr	0.0013	0.0016
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	0.0006	0.0007
EMISSION RATE OF TOTAL MERCURY				
Mthg = Mthgm/0.4536	Mthg	lb/hr	**0.0082**	**0.0094**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0037	0.0043

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT IPSC IPP, Unit 2
CITY Delta, UT
LOCATION Scrubber Inlet

TEST DATE: 10/14/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Inlet

DATA ENTRY	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			SI-Run4		
TEST DATE		m/d/y	10/14/99		
RUN TIME Start		hh:mm	10:05		
End		hh:mm	13:30		
ROUND STACK, DIAMETER	ds	inches			
RECTANGULAR STACK, LENGTH	L	inches	288.00		
WIDTH	W	inches	602.00		
NOZZLE DIAMETER	dn	inches	0.2550		
AVERAGE STACK TEMPERATURE	Fs	degrees F	299.6	#DIV/0!	#DIV/0!
AVERAGE METER TEMPERATURE	Fm	degrees F	62.6	#DIV/0!	#DIV/0!
STANDARD TEMPERATURE(68°(EPA),60°(AQMD))	Tstd	degrees F	68.0		
BAROMETRIC PRESSURE	Pbar	in. Hg	29.70		
STACK STATIC PRESSURE	Pg	in. H20	3.50		
AVG. DELTA H	dH	in. H20	1.398	#DIV/0!	#DIV/0!
AVG. VELOCITY HEAD	dP	in. H20	0.545	#DIV/0!	#DIV/0!
PITOT COEFFICIENT	Cp	-	0.8400		
GAS SAMPLE VOLUME	Vm	cubic ft.	78.075		
METER CALIBRATION FACTOR	Y	-	1.0062		
TOTAL SAMPLING TIME	min	minutes	125.0		
STACK GAS OXYGEN CONTENT	Co2,m	%	5.1		
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	14.2		
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	119.5	0.0	0.0
PARTICLE BOUND MERCURY CATCH	PHg	ug	< 0.040	0.000	0.000
OXIDIZED MERCURY	OHg	ug	2.673	#DIV/0!	#DIV/0!
ELEMENTAL MERCURY CATCH	EHg	ug	0.430	#DIV/0!	#DIV/0!
CALCULATED DATA	**SYMBOL**	**UNITS**	**DATA**	**DATA**	**DATA**
RUN NUMBER			SI-Run4		
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.0511	0.0000	0.0000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND)	As	sq. feet		######	#VALUE!
L * W/144 (RECTANGULAR)			1204.00	0.00	0.00
STANDARD TEMPERATURE(528°(EPA),520°(AQMD))	Tstdr	degrees R	528.0	460.0	460.0
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	759.6	#DIV/0!	#DIV/0!
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	522.6	#DIV/0!	#DIV/0!
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	79.031	#DIV/0!	#DIV/0!
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528)*Ww	VwStd	cubic ft.	5.625	0.000	0.000
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.066	#DIV/0!	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28[100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	30.48	28.00	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	29.65	#DIV/0!	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.96	0.00	0.00
STACK GAS VELOCITY					
vs = 85.49 Cp { sqrt[(dP*Ts)/(Ps*Mw)] }	vs	ft/s	49.05	#DIV/0!	#DIV/0!
vsm = 0.3048 * vs	vsm	m/s	14.95	#DIV/0!	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	3,543.071	#DIV/0!	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP)					
Qsd = 17.64 (Tstdr/528)*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	2,301.080	#DIV/0!	#DIV/0!
Qsdm = Qsd/35.31	Qsdm	dscm/min	65.168	#DIV/0!	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	93.3	#DIV/0!	#DIV/0!

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, Unit 2
CITY: Delta, UT
LOCATION: Scrubber Inlet

TEST DATE: 10/14/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW, CM

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Inlet

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)					
Cphg = 0.00001543 PHg/VmStd	Cphg	gr/dscf	< 7.81E-9	#DIV/0!	#DIV/0!
Cpghm = 35.31 * PHg/ VmStd	Cphgm	ug/dscm	< 1.79E-2	#DIV/0!	#DIV/0!
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)					
Cohg = 0.00001543 OHg/VmStd	Cohg	gr/dscf	5.22E-07	#DIV/0!	#DIV/0!
Cohgm = 35.31 * OHg / VmStd	Cohgm	ug/dscm	1.19	#DIV/0!	#DIV/0!
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)					
Cehg = 0.00001543 EHg/VmStd	Cehg	gr/dscf	8.40E-08	#DIV/0!	#DIV/0!
Cehgm = 35.31 * EHg / VmStd	Cehgm	ug/dscm	0.19	#DIV/0!	#DIV/0!
CONCENTRATION OF TOTAL MERCURY (DRY, STP)					
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	6.14E-7	#DIV/0!	#DIV/0!
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**1.40**	**#DIV/0!**	**#DIV/0!**
EMISSION RATE OF PARTICLE BOUND MERCURY					
Mphg = Mphgm/0.4536	Mphg	lb/hr	< 1.54E-4	#DIV/0!	#DIV/0!
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	< 6.99E-5	#DIV/0!	#DIV/0!
EMISSION RATE OF OXIDIZED MERCURY					
Mohg = Mohgm/0.4536	Mogh	lb/hr	0.0103	#DIV/0!	#DIV/0!
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	0.0047	#DIV/0!	#DIV/0!
EMISSION RATE OF ELEMENTAL MERCURY					
Mehg = Mehgm/0.4536	Mehg	lb/hr	0.0017	#DIV/0!	#DIV/0!
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	0.0008	#DIV/0!	#DIV/0!
EMISSION RATE OF TOTAL MERCURY					
Mthg = Mthgm/0.4536	Mthg	lb/hr	**0.0121**	**#DIV/0!**	**#DIV/0!**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0055	#DIV/0!	#DIV/0!

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT IPSC IPP, Unit 2
CITY Delta, UT
LOCATION Scrubber Inlet

TEST DATE: 10/14/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW, TM

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Outlet

DATA ENTRY	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			SI-Run4		
TEST DATE		m/d/y	10/14/99		
RUN TIME Start		hh:mm	10:05		
End		hh:mm	13:30		
ROUND STACK, DIAMETER	ds	inches			
RECTANGULAR STACK, LENGTH	L	inches	288.00		
WIDTH	W	inches	602.00		
NOZZLE DIAMETER	dn	inches	0.2550		
AVERAGE STACK TEMPERATURE	Fs	degrees F	299.6	#DIV/0!	#DIV/0!
AVERAGE METER TEMPERATURE	Fm	degrees F	62.6	#DIV/0!	#DIV/0!
STANDARD TEMPERATURE(68°(EPA),60°(AQMD))	Tstd	degrees F	68.0		
BAROMETRIC PRESSURE	Pbar	in. Hg	29.70		
STACK STATIC PRESSURE	Pg	in. H20	3.50		
AVG DELTA H	dH	in. H20	1.398	#DIV/0!	#DIV/0!
AVG VELOCITY HEAD	dP	in. H20	0.545	#DIV/0!	#DIV/0!
PITOT COEFFICIENT	Cp	-	0.8400		
GAS SAMPLE VOLUME	Vm	cubic ft.	78.075		
METER CALIBRATION FACTOR	Y	-	1.0062		
TOTAL SAMPLING TIME	min	minutes	125.0		
STACK GAS OXYGEN CONTENT	Co2.m	%	5.1		
STACK GAS CARBON DIOXIDE CONTENT	Cco2.m	%	14.2		
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	119.5	0.0	0.0
PARTICLE BOUND MERCURY CATCH	PHg	ug	< 0.040	0.000	0.000
OXIDIZED MERCURY	OHg	ug	2.673	#DIV/0!	#DIV/0!
ELEMENTAL MERCURY CATCH	EHg	ug	0.430	#DIV/0!	#DIV/0!
CALCULATED DATA	**SYMBOL**	**UNITS**	**DATA**	**DATA**	**DATA**
RUN NUMBER			SI-Run4		
NOZZLE AREA, An = 3.14(dn)**2.4	An	sq. in.	0.0511	0.0000	0.0000
STACK AREA, As = 3.14*(ds)**2.576 (ROUND)	As	sq. feet		#######	#VALUE!
= L * W.144 (RECTANGULAR)			1204.00	0.00	0.00
STANDARD TEMPERATURE(528°(EPA),520°(AQMD))	Tstdr	degrees R	528.0	460.0	460.0
AVG STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	759.6	#DIV/0!	#DIV/0!
AVG METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	522.6	#DIV/0!	#DIV/0!
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	79.031	#DIV/0!	#DIV/0!
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528)*Ww	VwStd	cubic ft.	5.625	0.000	0.000
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.066	#DIV/0!	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2.m)+ 0.44(Cco2.m)+0.28[100-(Co2.m)-(Cco2.m)]	Md	g/g-mole	30.48	28.00	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	29.65	#DIV/0!	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.96	0.00	0.00
STACK GAS VELOCITY					
vs = 85.49 Cp [sqrt[(dP* Fs)/(Ps*Mw)]]	vs	ft/s	49.05	#DIV/0!	#DIV/0!
vsm = 0.3048 * vs	vsm	m/s	14.95	#DIV/0!	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	3,543.071	#DIV/0!	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP)					
Qsd = 17.64 (Tstdr/528)*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	**1,990,000**	#DIV/0!	#DIV/0!
Qsdm = Qsd/35.31	Qsdm	dscm/min	56,358	#DIV/0!	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	93.3	#DIV/0!	#DIV/0!

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999).

Revised by MTF 101399

PLANT: IPSC IPP, Unit 2
CITY: Delta, UT
LOCATION: Scrubber Inlet

TEST DATE: 10/14/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW

Hg Mass Emissions Calculated Using Gas Flow Measured at Scrubber Outlet

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)					
Cphg = 0.00001543 PHg/VmStd	Cphg	gr/dscf	< 7.81E-9	#DIV/0!	#DIV/0!
Cphgm = 35.31 * PHg/ VmStd	Cphgm	ug/dscm	< 1.79E-2	#DIV/0!	#DIV/0!
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)					
Cohg = 0.00001543 OHg/VmStd	Cohg	gr/dscf	5.22E-07	#DIV/0!	#DIV/0!
Cohgm = 35.31 * OHg / VmStd	Cohgm	ug/dscm	1.19	#DIV/0!	#DIV/0!
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)					
Cehg = 0.00001543 EHg/VmStd	Cehg	gr/dscf	8.40E-08	#DIV/0!	#DIV/0!
Cehgm = 35.31 * EHg / VmStd	Cehgm	ug/dscm	0.19	#DIV/0!	#DIV/0!
CONCENTRATION OF TOTAL MERCURY (DRY, STP)					
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	6.14E-7	#DIV/0!	#DIV/0!
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**1.40**	**#DIV/0!**	**#DIV/0!**
EMISSION RATE OF PARTICLE BOUND MERCURY					
Mphg = Mphgm/0.4536	Mphg	lb/hr	< 1.33E-4	#DIV/0!	#DIV/0!
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	< 6.04E-5	#DIV/0!	#DIV/0!
EMISSION RATE OF OXIDIZED MERCURY					
Mohg = Mohgm/0.4536	Mogh	lb/hr	0.0089	#DIV/0!	#DIV/0!
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	0.0040	#DIV/0!	#DIV/0!
EMISSION RATE OF ELEMENTAL MERCURY					
Mehg = Mehgm/0.4536	Mehg	lb/hr	0.0014	#DIV/0!	#DIV/0!
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	0.0006	#DIV/0!	#DIV/0!
EMISSION RATE OF TOTAL MERCURY					
Mthg = Mthgm/0.4536	Mthg	lb/hr	**0.0105**	**#DIV/0!**	**#DIV/0!**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0047	#DIV/0!	#DIV/0!

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: [illegible]

Test Date	10 13 99
Run ID	SI-Run2

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	295	17.2	0.22	0.47	0.69	60	59
2	297	17.2	0.61	0.78	0.6	62	60
3	296	17.2	0.58	0.76	1.67	64	60
4	297	17.2	0.51	0.71	1.6	66	61
5	301	17.3	0.59	0.77	1.41	68	62
6	302	17.4	0.25	0.50	0.74	65	62
7	303	17.4	0.66	0.81	0.69	66	63
8	303	17.4	0.82	0.91	1.81	68	64
9	306	17.5	0.71	0.84	2.26	69	64
10	309	17.6	0.62	0.79	1.95	71	65
11	311	17.6	0.51	0.71	1.39	68	66
12	310	17.6	0.69	0.83	1.39	71	66
13	310	17.6	0.87	0.93	1.89	72	67
14	310	17.6	0.91	0.95	2.39	74	67
15	310	17.6	0.49	0.70	2.5	75	68
16	307	17.5	0.32	0.57	0.88	72	70
17	308	17.5	0.38	0.62	0.88	73	70
18	310	17.6	0.32	0.57	1.05	75	70
19	312	17.7	0.25	0.50	0.88	75	71
20	314	17.7	0.23	0.48	0.69	76	72
21	300	17.3	0.34	0.58	1.15	75	74
22	300	17.3	0.285	0.53	0.95	77	74
23	301	17.3	0.26	0.51	0.8	78	74
24	301	17.3	0.27	0.52	0.73	78	75
25	302	17.4	0.29	0.54	0.76	79	75
	304.6	**304.6**	0.48	**0.456**	**1.270**		**69.1 (1)**

DGM Reading (liters):

Initial	453.410
Final	467.995
Initial	468.115
Final	484.320
Initial	484.550
Final	503.245
Initial	503.525
Final	516.315
Initial	516.527
Final	529.405
Volume	**75.153**

Water Condensed in Impingers (g)

1 Final:	658.3	5 Final:	578.2
1 Initial:	566.4	5 Initial:	578.0
2 Final:	571.0	6 Final:	557.3
2 Initial:	561.9	6 Initial:	556.6
3 Final:	567.6	7 Final:	583.8
3 Initial:	565.5	7 Initial:	582.9
4 Final:	593.0	8 Final:	751.1
4 Initial:	589.5	8 Initial:	736.5
Total weight of impingers (g):			**123.0**

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101299

PLANT: IPSC IPP, UNIT 2
CITY: Delta, UT
LOCATION: SCRUBBER INLET

TEST DATE: 10/13/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: DWJ

Test Date	10/13/99
Run ID	SI-Run3

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	298	17.3	0.29	0.54	0.83	79	78
2	297	17.2	0.45	0.67	2.37	81	78
3	298	17.3	0.49	0.70	1.29	83	78
4	295	17.2	0.48	0.69	1.4	83	78
5	296	17.2	0.52	0.72	1.38	83	79
6	305	17.5	0.37	0.61	1.05	80	80
7	307	17.5	0.92	0.96	1.05	81	80
8	309	17.6	0.75	0.87	2.6	83	80
9	311	17.6	0.58	0.76	2.12	85	80
10	312	17.7	0.5	0.71	1.64	85	81
11	312	17.7	0.56	0.75	1.58	81	81
12	312	17.7	0.68	0.82	1.58	83	80
13	312	17.7	0.84	0.92	1.92	84	80
14	311	17.6	0.91	0.95	2.37	85	80
15	312	17.7	0.52	0.72	2.57	86	80
16	305	17.5	0.24	0.49	0.68	80	80
17	307	17.5	0.65	0.81	0.68	79	79
18	307	17.5	0.72	0.85	1.83	79	79
19	308	17.5	0.69	0.83	2.03	80	79
20	311	17.6	0.64	0.80	1.95	81	78
21	298	17.3	0.43	0.66	0.43	78	78
22	301	17.3	0.59	0.77	1.23	77	77
23	300	17.3	0.67	0.82	1.67	78	77
24	301	17.3	0.61	0.78	1.9	79	77
25	304	17.4	0.53	0.73	1.73	80	77
	305.2	**305.1**	0.59	**0.573**	**1.595**		**80.1 (1)**

DGM Reading (liters):

Initial:	530.000
Final:	546.350
Initial:	546.660
Final:	564.350
Initial:	564.604
Final:	584.040
Initial:	584.273
Final:	600.400
Initial:	600.685
Final:	616.520
Volume:	**85.438**

Water Condensed in Impingers (g)

1 Final:	669.6	5 Final:	571.0
1 Initial:	583.9	5 Initial:	570.3
2 Final:	597.3	6 Final:	563.2
2 Initial:	581.0	6 Initial:	563.4
3 Final:	576.7	7 Final:	568.7
3 Initial:	570.8	7 Initial:	567.7
4 Final:	554.3	8 Final:	782.9
4 Initial:	551.7	8 Initial:	766.5
Total weight of impingers (g):			**128.4**

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, Unit 2
CITY: Delta, UT
LOCATION: Scrubber Inlet
Test Date: 10 14 99
Run ID: SI-Run4

TEST DATE: 10/14/99
OPERATOR: JD, BZ
ENTERED BY: MF
CHECKED BY: SW

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	283	16.8	0.21	0.46	0.57	52	53
2	285	16.9	0.57	0.75	0.57	54	53
3	284	16.9	0.64	0.80	1.56	55	53
4	286	16.9	0.56	0.75	1.75	58	54
5	287	16.9	0.49	0.70	1.53	59	54
6	292	17.1	0.17	0.41	0.46	57	56
7	292	17.1	0.73	0.85	0.46	59	57
8	292	17.1	0.74	0.86	1.99	60	57
9	295	17.2	0.69	0.83	2.02	62	57
10	299	17.3	0.7	0.84	1.88	63	58
11	303	17.4	0.48	0.69	1.29	61	59
12	305	17.5	0.73	0.85	1.3	63	59
13	307	17.5	0.81	0.90	1.97	65	60
14	306	17.5	0.92	0.96	2.19	67	60
15	308	17.5	0.49	0.70	2.49	69	61
16	304	17.4	0.3	0.55	0.82	65	65
17	306	17.5	0.85	0.92	0.82	68	65
18	308	17.5	0.76	0.87	2.31	71	66
19	311	17.6	0.57	0.75	2.07	72	66
20	313	17.7	0.53	0.73	1.55	74	67
21	303	17.4	0.27	0.52	0.74	68	68
22	305	17.5	0.45	0.67	0.74	70	68
23	306	17.5	0.49	0.70	1.23	71	69
24	306	17.5	0.47	0.69	1.34	78	62
25	306	17.5	0.49	0.70	1.29	73	68
	299.7	**299.6**	0.56	**0.545**	**1.398**		**62.6 (1)**

DGM Reading (liters):

Initial:	616.760
Final:	631.135
Initial:	631.275
Final:	646.350
Initial:	646.570
Final:	664.755
Initial:	664.945
Final:	681.305
Initial:	681.515
Final:	695.595
Volume:	**78.075**

Water Condensed in Impingers (g)

1 Final:	654.0	5 Final:	593.1
1 Initial:	566.5	5 Initial:	593.8
2 Final:	576.5	6 Final:	570.5
2 Initial:	563.3	6 Initial:	569.9
3 Final:	573.3	7 Final:	599.0
3 Initial:	571.8	7 Initial:	598.7
4 Final:	560.1	8 Final:	740.3
4 Initial:	557.8	8 Initial:	725.5
Total weight of impingers (g):			119.5

Stack

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, Delta, UT
CITY: Delta, UT
LOCATION: STACK

TEST DATE: 10/13/99
OPERATOR: MF, JJ
ENTERED BY: MF, JJ
CHECKED BY:

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)				
Cphg = 0.00001543 PHg VmStd	Cphg	gr/dscf	5.09E-9	2.84E-9
Cpghm = 35.31 * PHg VmStd	Cphgm	ug/dscm	1.16E-2	6.50E-3
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)				
Cohg = 0.00001543 OHg/VmStd	Cohg	gr/dscf	< 1.79E-8	3.03E-08
Cohgm = 35.31 * OHg VmStd	Cohgm	ug/dscm	< 4.09E-2	6.94E-2
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)				
Cehg = 0.00001543 EHg VmStd	Cehg	gr/dscf	1.01E-07	1.82E-07
Cehgm = 35.31 * EHg VmStd	Cehgm	ug/dscm	0.23	0.42
CONCENTRATION OF TOTAL MERCURY (DRY, STP)				
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	1.24E-07	2.15E-07
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**0.28**	**0.49**
EMISSION RATE OF PARTICLE BOUND MERCURY				
Mphg = Mphgm/0.4536	Mphg	lb/hr	8.51E-5	4.78E-5
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	3.86E-5	2.17E-5
EMISSION RATE OF OXIDIZED MERCURY				
Mohg = Mohgm/0.4536	Mogh	lb/hr	< 2.98E-4	5.11E-4
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	< 1.35E-4	2.32E-4
EMISSION RATE OF ELEMENTAL MERCURY				
Mehg = Mehgm/0.4536	Mehg	lb/hr	1.68E-3	3.05E-3
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	7.62E-4	1.39E-3
EMISSION RATE OF TOTAL MERCURY				
Mthg = Mthgm/0.4536	Mthg	lb/hr	**0.0021**	**0.0036**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0009	0.0016

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP
CITY: Delta, UT
LOCATION: STACK

TEST DATE: 10/14/99
OPERATOR: MF, JJ
ENTERED BY: MF
CHECKED BY:

DATA ENTRY	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			SO-Run4		
TEST DATE		m/d/y	10/14/99		
RUN TIME Start		hh:mm	10:05		
End		hh:mm	13:30		
ROUND STACK, DIAMETER	ds	inches	336.00		
RECTANGULAR STACK, LENGTH	L	inches			
WIDTH	W	inches			
NOZZLE DIAMETER	dn	inches	0.2042		
AVERAGE STACK TEMPERATURE	Ts	degrees F	119.1	#DIV 0!	#DIV 0!
AVERAGE METER TEMPERATURE	Tm	degrees F	76.3	#DIV 0!	#DIV 0!
STANDARD TEMPERATURE(68 (EPA),60 (AQMD))	Tstd	degrees F	68.0		
BAROMETRIC PRESSURE	Pbar	in. Hg	29.56		
STACK STATIC PRESSURE	Pg	in. H20	-0.75		
AVG DELTA H	dH	in. H20	1.860	#DIV 0!	#DIV 0!
AVG VELOCITY HEAD	dP	in. H20	1.310	#DIV 0!	#DIV 0!
PITOT COEFFICIENT	Cp	-	0.8400		
GAS SAMPLE VOLUME	Vm	cubic ft.	90.170		
METER CALIBRATION FACTOR	Y	-	0.9992	0.9992	0.9992
TOTAL SAMPLING TIME	min	minutes	120.0	120.0	120.0
STACK GAS OXYGEN CONTENT	Co2,m	%	5.1		
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	14.2		
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	247.1	0.0	0.0
PARTICULATE BOUND MERCURY CATCH	PHg	ug	0.023	0.000	0.000
OXIDIZED MERCURY	OHg	ug	0.171	#DIV 0!	#DIV 0!
ELEMENTAL MERCURY CATCH	EHg	ug	0.893	#DIV 0!	#DIV 0!

CALCULATED DATA	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			SO-Run4		
NOZZLE AREA, An = 3.14(dn/12)^2/4	An	sq. in.	0.0327	0.0000	0.0000
STACK AREA, As = 3.14*(ds/12)^2/576 (ROUND)	As	sq. feet	615.75	0.00	0.00
L * W/144 (RECTANGULAR)				#######	#VALUE!
STANDARD TEMPERATURE(528 (EPA),520 (AQMD))	Tstdr	degrees R	528.0	460.0	460.0
AVG STACK TEMPERATURE, Ts = Ts + 460	Ts	degrees R	579.1	#DIV 0!	#DIV 0!
AVG METER TEMPERATURE, Tm = Tm + 460	Tm	degrees R	536.3	#DIV 0!	#DIV 0!
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	88.015	#DIV 0!	#DIV 0!
VOLUME OF WATER VAPOR, VwStd = 0.0470* (Tstdr/528)*Ww	VwStd	cubic ft.	11.629	0.000	0.000
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)*	Bws	none	0.115	#DIV 0!	#DIV 0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m) + 0.44(Cco2,m) + 0.28[100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	30.48	28.00	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws) + 18.0(Bws)	Mw	g/g-mole	29.04	#DIV 0!	#DIV 0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.50	0.00	0.00
STACK GAS VELOCITY					
vs = 85.49*Cp*sqrt(dP*Ts/(Ps*Mw))	vs	ft/s	67.58	#DIV 0!	#DIV 0!
vsm = 0.3048 * vs	vsm	m/s	20.60	#DIV 0!	#DIV 0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	2,496,793	#DIV 0!	#DIV 0!
DRY GAS STACK FLOW RATE (DRY,STP)					
Qsd = 17.64 (Tstdr/528)*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	1,985,855	#DIV 0!	#DIV 0!
Qsdm = Qsd/35.3	Qsdm	dscm/min	56,241	#DIV 0!	#DIV 0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/(Ps*vs*An*min*(1-Bws))	I	%	100.0	#DIV 0!	#DIV 0!

* Calculated from Eq/Ve 6-2 in the SSTP, the stack was saturated

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999)

Revised by MTF 101399

PLANT: IPSC IPP
CITY: Delta, UT
LOCATION: STACK

TEST DATE: 10/14/99
OPERATOR: MF, JJ
ENTERED BY: MF
CHECKED BY:

CONCENTRATION OF PARTICLE BOUND MERCURY (DRY, STP)					
Cphg = 0.00001543 PHg / VmStd	Cphg	gr/dscf	4.03E-9	#DIV/0!	#DIV/0!
Cpghm = 35.31 * PHg / VmStd	Cphgm	ug/dscm	9.23E-3	#DIV/0!	#DIV/0!
CONCENTRATION OF OXIDIZED MERCURY (DRY, STP)					
Cohg = 0.00001543 OHg / VmStd	Cohg	gr/dscf	3.00E-08	#DIV/0!	#DIV/0!
Cohgm = 35.31 * OHg / VmStd	Cohgm	ug/dscm	6.86E-02	#DIV/0!	#DIV/0!
CONCENTRATION OF ELEMENTAL MERCURY (DRY, STP)					
Cehg = 0.00001543 EHg / VmStd	Cehg	gr/dscf	1.57E-07	#DIV/0!	#DIV/0!
Cehgm = 35.31 * EHg / VmStd	Cehgm	ug/dscm	0.36	#DIV/0!	#DIV/0!
CONCENTRATION OF TOTAL MERCURY (DRY, STP)					
Cthg = Cphg + Cohg + Cehg	Cthg	gr/dscf	1.91E-07	#DIV/0!	#DIV/0!
Cthgm = Cphgm + Cohgm + Cehgm	Cthgm	ug/dscm	**0.44**	**#DIV/0!**	**#DIV/0!**
EMISSION RATE OF PARTICLE BOUND MERCURY					
Mphg = Mphgm / 0.4536	Mphg	lb/hr	6.86E-5	#DIV/0!	#DIV/0!
Mphgm = Qsdm * Cphgm * 60 / 1e9	Mphgm	kg/hr	3.11E-5	#DIV/0!	#DIV/0!
EMISSION RATE OF OXIDIZED MERCURY					
Mohg = Mohgm / 0.4536	Mogh	lb/hr	5.1E-4	#DIV/0!	#DIV/0!
Mohgm = Qsdm * Cohgm * 60 / 1e9	Moghm	kg/hr	2.3E-4	#DIV/0!	#DIV/0!
EMISSION RATE OF ELEMENTAL MERCURY					
Mehg = Mehgm / 0.4536	Mehg	lb/hr	0.0027	#DIV/0!	#DIV/0!
Mehgm = Qsdm * Cehg* 60 / 1e9	Mehgm	kg/hr	0.0012	#DIV/0!	#DIV/0!
EMISSION RATE OF TOTAL MERCURY					
Mthg = Mthgm / 0.4536	Mthg	lb/hr	**0.0032**	**#DIV/0!**	**#DIV/0!**
Mthgm = Qsdm * Cthgm* 60 / 1e9	Mthgm	kg/hr	0.0015	#DIV/0!	#DIV/0!

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP, Delta, UT
CITY: Delta, UT
LOCATION: STACK
Test Date: 10/13/99
Run ID: SO-Run 2

TEST DATE: 10/12/99
OPERATOR: MF, JJ
ENTERED BY: MF, JJ
CHECKED BY: SW

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	120	11.0	1.42	1.19	1.96	69	69
2	120	11.0	1.38	1.17	1.91	71	69
3	119	10.9	1.15	1.07	1.6	74	69
4	119	10.9	1.2	1.10	1.67	76	69
5	118	10.9	1.12	1.06	1.57	79	71
6	118	10.9	1.2	1.10	1.68	80	72
7	119	10.9	1.25	1.12	1.75	75	74
8	119	10.9	1.25	1.12	1.76	81	74
9	118	10.9	1.2	1.10	1.7	84	75
10	119	10.9	1.1	1.05	1.55	85	75
11	120	11.0	1.05	1.02	1.48	86	77
12	119	10.9	1.05	1.02	1.49	87	77
13	120	11.0	1.36	1.17	1.92	83	78
14	120	11.0	1.35	1.16	1.91	86	79
15	120	11.0	1.3	1.14	1.85	88	80
16	120	11.0	1.3	1.14	1.85	89	80
17	120	11.0	1.25	1.12	1.78	90	81
18	120	11.0	1.25	1.12	1.78	90	81
19	121	11.0	1.5	1.22	2.11	80	79
20	121	11.0	1.5	1.22	2.11	82	80
21	120	11.0	1.46	1.21	2.07	84	80
22	121	11.0	1.43	1.20	2.03	87	80
23	121	11.0	1.2	1.10	1.71	90	81
24	121	11.0	1.18	1.09	1.68	90	81
25							
	119.7	**119.7**	1.27	**1.265**	**1.788**		**79.5 (1)**

DGM Reading (liters):

Initial	525.175
Final	546.838
Initial	546.975
Final	568.155
Initial	568.276
Final	590.860
Initial	591.108
Final	614.736
Initial	
Final	
Volume	**89.055**

Water Condensed in Impingers (g)

1 Final:	732.6	5 Final	597.0
1 Initial:	584.0	5 Initial	595.5
2 Final:	621.8	6 Final	562.3
2 Initial:	557.8	6 Initial	560.0
3 Final:	586.6	7 Final	603.04
3 Initial:	573.1	7 Initial	602.3
4 Final:	574.8	8 Final	722.41
4 Initial:	570.3	8 Initial	705.9
Total weight of impingers (g):			**251.6**

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101299

PLANT: IPSC IPP, Delta, UT
CITY: Delta, UT
LOCATION: STACK

TEST DATE: 10/12/99
OPERATOR: MF, JJ
ENTERED BY: MF, JJ
CHECKED BY: SW

Test Date: 10/13/99
Run ID: SO-Run3

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	121	11.0	1.55	1.24	2.18	81	80
2	121	11.0	1.5	1.22	2.11	82	80
3	120	11.0	1.47	1.21	2.08	84	80
4	120	11.0	1.47	1.21	2.09	86	81
5	120	11.0	1.25	1.12	1.78	89	81
6	120	11.0	1.25	1.12	1.78	90	82
7	120	11.0	1.41	1.19	2	85	82
8	120	11.0	1.35	1.16	1.92	87	83
9	120	11.0	1.2	1.10	1.71	90	84
10	120	11.0	1.3	1.14	1.86	90	84
11	120	11.0	1.1	1.05	1.58	93	85
12	120	11.0	1.15	1.07	1.65	93	85
13	120	11.0	1.25	1.12	1.77	83	83
14	121	11.0	1.2	1.10	1.7	84	83
15	120	11.0	1.15	1.07	1.64	87	83
16	120	11.0	1.2	1.10	1.71	89	83
17	120	11.0	1.15	1.07	1.64	90	84
18	120	11.0	1.15	1.07	1.65	92	84
19	120	11.0	1.4	1.18	1.98	82	81
20	120	11.0	1.42	1.19	2.01	83	82
21	120	11.0	1.4	1.18	1.99	86	81
22	119	10.9	1.3	1.14	1.85	87	81
23	119	10.9	1.14	1.07	1.63	90	82
24	120	11.0	1.14	1.07	1.63	90	83
25							
	120.0	**120.0**	1.29	**1.284**	**1.831**		**84.8 (1)**

DGM Reading (liters):

Initial:	615.690
Final:	639.478
Initial:	639.634
Final:	661.783
Initial:	662.525
Final:	684.164
Initial:	684.328
Final:	707.251
Initial:	
Final:	
Volume:	**90.499**

Water Condensed in Impingers (g)

1 Final:	716.2	5 Final:	593.7
1 Initial:	564.3	5 Initial:	593.2
2 Final:	639.1	6 Final:	577.8
2 Initial:	589.2	6 Initial:	576.5
3 Final:	582.7	7 Final:	605.5
3 Initial:	568.0	7 Initial:	605.3
4 Final:	566.1	8 Final:	778.5
4 Initial:	559.8	8 Initial:	760.1
Total weight of impingers (g):			**243.2**

ONTARIO HYDRO METHOD (DRAFT VERSION SEPTEMBER 1, 1999) Revised by MTF 101399

PLANT: IPSC IPP
CITY: Delta, UT
LOCATION: STACK

TEST DATE: 10/14/99
OPERATOR: MF, JJ
ENTERED BY: MF
CHECKED BY: SCJ

Test Date: 10 14 99
Run ID: SO-Run4

	Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM-In Temp (°F)	DGM-Out Temp (°F)
1	120	11.0	1.45	1.20	2.01	66	66
2	119	10.9	1.5	1.22	2.08	67	66
3	118	10.9	1.43	1.20	2	72	66
4	117	10.8	1.4	1.18	1.96	73	67
5	118	10.9	1.1	1.05	1.55	76	68
6	118	10.9	1.1	1.05	1.55	77	69
7	118	10.9	1.3	1.14	1.82	72	70
8	118	10.9	1.3	1.14	1.83	75	72
9	118	10.9	1.22	1.10	1.73	79	72
10	118	10.9	1.3	1.14	1.85	81	74
11	118	10.9	1.1	1.05	1.57	83	74
12	118	10.9	1.1	1.05	1.57	83	75
13	120	11.0	1.4	1.18	1.98	76	75
14	120	11.0	1.4	1.18	1.98	77	75
15	120	11.0	1.4	1.18	1.98	81	75
16	120	11.0	1.31	1.14	1.86	83	76
17	120	11.0	1.15	1.07	1.64	84	77
18	120	11.0	1.15	1.07	1.64	85	77
19	120	11.0	1.52	1.23	2.15	77	78
20	120	11.0	1.52	1.23	2.16	80	78
21	120	11.0	1.5	1.22	2.14	84	78
22	120	11.0	1.5	1.22	2.14	86	78
23	120	11.0	1.2	1.10	1.72	89	79
24	121	11.0	1.2	1.10	1.72	89	80
25							
	119.1	**119.1**	1.31	**1.310**	**1.860**		**76.3 (1)**

DGM Reading (liters):

Initial:	707.518
Final:	730.050
Initial:	730.483
Final:	752.084
Initial:	752.167
Final:	774.651
Initial:	774.875
Final:	798.428
Initial:	
Final:	
Volume:	**90.170**

Water Condensed in Impingers (g)

1 Final:	731.9	5 Final:	595.6
1 Initial:	589.0	5 Initial:	595.5
2 Final:	635.9	6 Final:	560.3
2 Initial:	560.1	6 Initial:	559.9
3 Final:	583.2	7 Final:	603.4
3 Initial:	575.5	7 Initial:	602.2
4 Final:	575.2	8 Final:	813.2
4 Initial:	573.3	8 Initial:	796.2
Total weight of impingers (g):			**247.1**

Appendix B

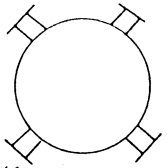
Raw Field Data and Calibration Data Sheets

Scrubber Inlet

ONTARIO HYDRO METHOD FOR MERCURY

BROKE ORIGINAL RCS

Plant: IPSC	Sample Box Number CA2	Nozzle No. ~~P-TC1~~ Diameter .2495 ID (in.) .2550		Sheet 1 of 2
City: DELTA	Meter Box Number CA2	Filter Number ~~ID 99100113~~ 99100111		Isokinetic Factor, K
Location: INLET	Meter Calibration (Y) 1.0062	Static Pressure (Pa) +3.5 (in. H2O)		
Operator: J.D. BOB Z	Meter dH @ 1.7678	Barometric Pressure (Pb) 29.7 (in. Hg)		
Date: 10-13-99	Pitot Tube No. 63 Cp .84	Ambient Temperature (°F) 83		
Run Number: RUN 2 SI OHM	Probe Length 20' TC No. 2004	Pretest Leak Rate 0.00 cfm @ 10 (in. Hg)		
Stack Diam., Inches: 1200	Probe Liner Material TFE	Post Test Leak Rate 0.00 cfm @ 10 (in. Hg)		
Assumed moisture, %: 7.6	Probe Heater Setting (°F) 248	Pitot Check: Pretest ✓ Post Test ✓		
Assumed O2% 4	CO2% 13.5			



P22	P18	P13	P18	P22
0	0	0	0	0

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	Filter ~~Probe~~ Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P22/5	0	11:47		295	.250		453.410	50	59						
2 5	5	11:52	5	295	.220	0.69	455.700	60	59	47	300	248	102.1	455.65	
3 4	10	11:57	4	297	.610	0.60	457.850	62	60	38	301	253	102.17	457.80	
4 3	15	12:02	7	296	.580	1.67	461.340	64	60	36	301	253	99.70	461.35	
5 2	20	12:07	7	297	.510	1.60	464.770	66	61	34	254	248	100.21	464.76	
6 1	25	12:12	7	301	.590	1.41	467.995	68	62	34	249	248	100.21	467.99	LEAK CHECK 0.00 CFM 10 in
7 P18/5	0	12:21		301	.270		468.115	64	62						
8 5	5	12:26	5	302	.250	0.74	470.500	65	62	47	300	249	102.05	470.45	LEAK CHECK 0.00 10 in HG
9 4	10	12:31	5	303	.660	0.69	472.760	66	63	38	320	255	100.46	472.75	
10 3	15	12:36	6	303	.820	1.81	476.420	68	64	36	294	255	100.28	476.41	
11 2	20	12:41	8	306	.710	2.26	480.505	69	64	35	258	253	100.23	480.50	
12 1	25	12:46	8	309	.620	1.95	484.320	71	65	36	257	251	100.63	484.30	LEAK CHECK 0.00 10 in
13 P13/5	0	13:03		310	.510		484.550	67	66						LEAK CHECK 0.00 10 in HG
14 5	5	13:08	6	311	.510	1.39	487.765	68	66	51	283	250	100.18	487.76	
15 4	10	13:13	6	310	.690	1.39	490.975	71	66	38	300	249	99.99	490.98	
16 3	15	13:18	7	310	.870	1.89	494.710	72	67	35	297	255	99.80	494.72	
17 2	20	13:23	9	310	.910	2.39	498.930	74	67	34	250	255	100.35	498.92	
~~Average~~/Total 1	25	13:28	9	310	.490	2.50	503.245	75	68	34	249	254	100.17	503.24	LEAK CHECK 0.00 11 in HG

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

EER

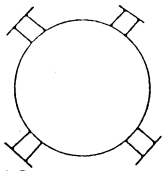
ONTARIO HYDRO METHOD FOR MERCURY

Plant: IPSC
City: DELTA
Location: INLET
Operator: J.D. - B.Z.
Date: 10-13-99
Run Number: RUN 2 SJ OHM
Stack Diam., inches: 1200
Assumed moisture, %: 7.6
Assumed O2%: 4

Sample Box Number: CA2
Meter Box Number: CA2
Meter Calibration (Y): 1.0062
Meter dH @: 1.7628
Pitot Tube No.: 63 Cp: .84
Probe Length: 20' TC No.: 2004
Probe Liner Material: TFE
Probe Heater Setting (°F): 248
CO2%: 13.5

Nozzle No.: C1 Diameter: .2550 (in.)
Filter Number: 99100111
Static Pressure (Pa): -3.5 (in. H2O)
Barometric Pressure (Pb): 29.7 (in. Hg)
Ambient Temperature (°F): 63
Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)
Post Test Leak Rate: 0.00 cfm @ 10 (in. Hg)
Pitot Check: Pretest ✓ Post Test ✓

Sheet 2 of 2
Isokinetic Factor, K



P2	P8	P13	P18	P22
0	0	0	0	0

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	~~Filter~~ Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P8/5	0	14:00		300	.320		503.525	70	70						LEAK CHECK 0.00CFM/10 in
2 5	5	14:05	5	307	.320	0.88	506.100	72	70	41	274	248	100.17	506.10	
3 4	10	14:10	5	308	.380	0.88	508.650	73	70	35	300	249	99.11	508.67	
4 3	15	14:15	5	310	.320	1.05	511.440	75	70	35	293	250	99.55	511.45	
5	20	14:20	5	312	.250	0.88	514.025	75	71	36	275	251	100.41	514.01	
6 1	25	14:25	4	314	.230	0.69	516.315	76	72	37	270	249	100.63	516.30	LEAK CHECK 0.00CFM 10 IN
7															
8 P2/5	0	14:50					519.527								LEAK CHECK 0.00CFM 10 INHG
9 5	5	14:55	6	300	.340	1.15	519.475	75	74	43	282	249	100.29	519.47	
10 4	10	15:00	5	300	.285	0.95	522.145	77	74	40	301	250	99.61	522.16	
11 3	15	15:05	5	301	.260	0.80	524.600	73	74	39	290	248	99.81	524.60	
12 2	20	15:10	5	301	.270	0.73	527.000	78	75	40	275	243	102.11	526.95	
13 1	25	15:15	5	302	.290	0.76	529.405	79	75	42	252	244	100.33	529.40	
14															
15															
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

AVE ISO = 100.42
SMPL VOL = 74.80
VEL (FT/S) = 52.53
FLOW (ACFM) 3781832...

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: Scrubber Inlet

Train Set No. Orange

Run No.: R#2 - S1 - OHM

Tared Filter # ~~99100113~~ B Zone Nozzle & Replaced Filter W/ Nozzle Change RCS
J.D. 99100111

Operator: J. Dean / B. Zimmerman

Run Time: 11:47 - 15:20

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	658.3	
				Initial	566.4	
				Wt. gain	91.9	Clear.
2	1 N KCL	100	MOD	Final	571.0	
				Initial	561.9	
				Wt. gain	9.1	
3	1 N KCL	100	G.S.	Final	567.6	
				Initial	565.5	
				Wt. gain	2.1	
4	5% HNO3/10% H2O2	100	MOD	Final	593.0	
				Initial	589.5	
				Wt. gain	3.5	
5	10% H2SO4/4% KMnO4	100	MOD	Final	578.2	
				Initial	578.0	Purple
				Wt. gain	.2	
6	10% H2SO4/4% KMnO4	100	MOD	Final	557.3	If not purple @ E.O.T. suspect break through.
				Initial	556.6	
				Wt. gain	.7	
7	10% H2SO4/4% KMnO4	100	G.S	Final	583.8	
				Initial	582.9	
				Wt. gain	.9	
8	Silica Gel	6"	MOD	Final	751.1	
				Initial	736.5	1/8" Spent
				Wt. gain	14.6	

123.0g TOTAL

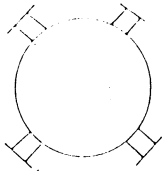
Train set up: Date: 10-13-99
Signature: [illegible]

Train recovery: Date: 10-13-99
Signature: [illegible]

EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant: IPSC	Sample Box Number: C-2	Nozzle No: 53	Diameter: .2553 (in)		Sheet 1 of 2
City: DELTA	Meter Box Number: C-2	Filter Number: 97100112			Isokinetic Factor, K
Location: INLET	Meter Calibration (Y): 1.0062	Static Pressure (Ps): +3.5 (in. H2O)			
Operator: JEFF D BOB Z	Meter dH@: 1.7678	Barometric Pressure (Pb): 29.7 (in. Hg)			
Date: 10-13-99	Pitot Tube No. 63 Cp: .84	Ambient Temperature (°F): 70			
Run Number: Run 3 SI OHM	Probe Length: 20 TC No. 2004	Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)			
Stack Diam., inches: 1200	Probe Liner Material: TFE	Post Test Leak Rate: 0.00 cfm @ 12 (in. Hg)			
Assumed moisture, %: 7.5	Probe Heater Setting (°F): 248	Pitot Check: Pretest ✓ Post Test ✓			
Assumed O2%: 4	CO2%: 13.8				



PT	PB	PB	PB	PT
0	0	0	0	0

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp. Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp (°F) (c)	Probe Exit Temp (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P2 /5	0	17:15					530.0								
2 5	5	17:20	5	298	.290	.83	532.5	79	78	34	310	248	99.92	532.5	
3 4	10	17:25	8	297	.450	2.37	536.73	81	78	36	312	250	100.22	536.72	
4 3	15	17:30	8	298	.490	1.29	539.860	83	78	34	315	252	100.19	539.85	
5 2	20	17:35	7	295	.480	1.40	543.100	83	78	35	297	255	99.30	543.12	
6 1	25	17:40	7	296	.520	1.38	546.350	83	79	36	262	256	100.43	546.34	LEAK CHECK 0.00 CFM 11 INHG
7 P3 /5	0	18:36					546.660								BROKE NOZZLE NEW NOZZLE-CL X
8 5	5	18:41	6	305	.370	1.05	549.139	80	80	49	260	247	100.46	549.418	LEAK CHECK 0.00 CFM 10 INHG
9 4	10	18:46	6	307	.920	1.05	552.330	81	80	41	263	248	100.63	552.31	
10 3	15	18:51	10	309	.750	2.60	556.770	83	80	39	262	248	100.A	556.76	
11 2	20	18:56	9	311	.580	2.12	560.795	85	80	36	270	252	100.42	560.78	
12 1	25	19:01	7	312	.500	1.64	564.350	85	81	36	264	252	100.65	564.33	LEAK CHECK 10 INHG 0.00 CFM
13 P3 /5	0	19:18		~~312~~	~~.560~~		564.604	81	81						LEAK CHECK 10 INHG 0.00 CFM
14 5	5	19:23	7	312	.560	1.58	568.06	81	81	55	249	250	99.94	568.06	
15 4	10	19:28	7	312	.680	1.58	571.546	83	80	42	307	248	100.64	571.52	
16 3	15	19:33	8	312	.840	1.92	575.340	84	80	41	310	251	99.71	575.35	
17 2	20	19:38	9	311	.910	2.37	579.600	85	80	42	268	252	100.6	579.57	
~~Average~~/Total 1	25	19:43	10	312	.520	2.57	584.049	86	80	43	265	249	100.63	584.01	LEAK CHECK 0.00 CFM 10 INHG

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

EER

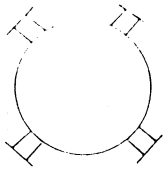
ONTARIO HYDRO METHOD FOR MERCURY

Plant: IPSC
City: DELTA
Location: INLET
Operator: JEFF D BOB Z
Date: 10-13-99
Run Number: RUN 3 SJ CHM
Stack Diam., inches: 1200
Assumed moisture, %: 7.5
Assumed O2%: 4

Sample Box Number: C42
Meter Box Number: C42
Meter Calibration (Y): 1.0062
Meter dH @: 1.7678
Pitot Tube No.: 63 Cp: .841
Probe Length: 20 TC No.: Z004
Probe Liner Material: TFE
Probe Heater Setting (°F): 248
CO2%: 13.8

Nozzle No.: 51 Diameter: .250 (in.)
Filter Number: 99100112
Static Pressure (Pa): -3.5 (in. H2O)
Barometric Pressure (Pb): 29.7 (in. Hg)
Ambient Temperature (°F): 76
Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)
Post Test Leak Rate: 0.00 cfm @ 12 (in. Hg)
Pitot Check: Pretest ✓ Post Test ✓

Sheet 2 of 2
Isokinetic Factor, K



P2	P2	P3	P2	P2
0	0	0	0	0

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (In. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (In. H2O)	Pressure Differential Across Orifice dH (In. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P18 /5	0	19:58					584.273								
2 5	5	20:03	5	305	.240	0.68	586.570	80	80	53	280	251	100.97	586.55	LEAK CHECK 0.00 @ 10 in Hg
3 4	10	20:08	5	307	.650	0.68	588.865	79	79	39	277	253	100.88	588.84	
4 3	15	20:13	7	307	.720	1.83	592.605	79	79	37	303	249	100.50	592.59	
5 2	20	20:18	8	308	.640	2.03	596.535	80	79	34	272	248	100.59	596.52	
6 1	25	20:23	8	311	.640	1.95	600.400	81	78	35	264	252	100.50	600.37	LEAK CHECK 0.00 @ 11 in HG
7															
8 P22/5	0	20:32					600.625								
9 5	5	20:37	4	298	.430	0.43	602.51	78	78	50	275	251	101.32	602.49	LEAK CHECK 0.00 @ 10 in HG
10 4	10	20:42	6	301	.590	1.23	605.560	77	77	39	316	257	100.31	605.55	
11 3	15	20:47	6	300	.670	1.67	609.125	78	77	36	311	258	99.49	609.11	
12 2	20	20:52	8	301	.610	1.90	612.895	79	77	36	271	260	99.62	612.91	
13 1	25	20:57	8	304	.530	1.73	616.528	80	77	37	252	260	100.32	616.51	
14															
15															
16															
17															
Average Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68 F
c) >248 F or Ts +27 F, whichever is greater
d) 1.0 dscm < vol < 2.5 dscm

AVG 150 = 100.38
SMPL VOL = 83.27
VOL (FT³) 57.32
FLOW (ACFM) 4.72294...

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: SCRUBBER INLET

Train Set No. BLUE

Run No.: 23-SI-OHM-

Tared Filter # 99100/12

Operator: B. ZIMPERMAN / J. DEAN

Run Time: 17:15 - 20:57

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	669.6	
				Initial	583.9	
				Wt. gain	85.7	CLEAR
2	1 N KCL	100	MOD	Final	597.3	
				Initial	581.0	
				Wt. gain	16.3	
3	1 N KCL	100	G.S.	Final	576.7	
				Initial	570.8	
				Wt. gain	5.9	
4	5% HNO3/10% H2O2	100	MOD	Final	554.3	
				Initial	551.7	
				Wt. gain	2.6	
5	10% H2SO4/4% KMnO4	100	MOD	Final	571.0	
				Initial	570.3	
				Wt. gain	.7	Purple
6	10% H2SO4/4% KMnO4	100	MOD	Final	563.2	If not purple @ E.O.T. suspect break through
				Initial	563.4	
				Wt. gain	-.2	
7	10% H2SO4/4% KMnO4	100	G.S	Final	568.7	
				Initial	567.7	
				Wt. gain	1.0	
8	Silica Gel	6"	MOD	Final	782.9	
				Initial	766.5	
				Wt. gain	16.4	1/8 spent

128.4 g total

Train set up: Date: 10-13-99

Signature: [signature]

Train recovery: Date: 10-19-99

Signature: [signature]

EER

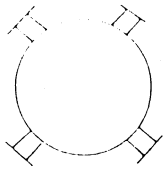
ONTARIO HYDRO METHOD FOR MERCURY

Plant: JPSC
City: DELTA
Location: INLET
Operator: JEFF D BOB Z
Date: 10-14-99
Run Number: Run 4 SI OHM
Stack Diam., inches: 1200
Assumed moisture, %: ~~5.0~~ 8.0
Assumed O2%: 4

Sample Box Number: CA2
Meter Box Number: CA2
Meter Calibration (Y): 1.0062
Meter dH @: 1.7678
Pitot Tube No.: 63 Cp: .84
Probe Length: 20' TC No.: 2004
Probe Liner Material: TFE
Probe Heater Setting (°F): 248
CO2%: 13.8

Nozzle No.: C1 Diameter: .2350 (in.)
Filter Number: 99100107
Static Pressure (Pa): + 3.5 (in. H2O)
Barometric Pressure (Pb): 29.7 (in. Hg)
Ambient Temperature (°F): 70
Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)
Post Test Leak Rate: 0.00 cfm @ 12 (in. Hg)
Pilot Check: Pretest ✓ Post Test

Sheet 1 of 2
Isokinetic Factor, K



P2	P8	P3	P18	P22
○	○	○	○	○

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (In. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (In. H2O)	Pressure Differential Across Orifice dH (In. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp (°F) (c) DEEP	~~Filter Exit Temp (°F) (c)~~ SHALLOW	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P22/5	0	10:05		283	.210		616.760	52	52						
2 5	5	10:10	5	283	.210	0.57	618.815	52	53	40	305	249	101.02	618.79	
3 4	10	10:15	4	285	.570	0.57	620.890	54	53	34	310	252	101.91	620.85	
4 3	15	10:20	6	284	.640	1.56	624.220	55	53	31	311	252	99.45	624.24	
5 2	20	10:25	7	286	.560	1.75	627.770	58	54	30	277	251	99.94	627.77	
6 1	25	10:30	6	287	.490	1.53	631.135	59	54	30	258	250	100.96	631.10	LEAK CHECK 0.00 10 in
7 P18/5	0	10:41		290	.170		631.275	57	57						
8 5	5	10:46	4	292	.170	0.46	633.125	57	56	36	248	250	100.55	633.11	
9 4	10	10:51	4	292	.730	0.46	635.00	59	57	33	296	251	102.14	634.96	
10 3	15	10:56	8	292	.740	1.99	638.770	60	57	31	310	254	99.19	638.80	
11 2	20	11:01	8	295	.690	2.02	642.580	62	57	30	268	251	99.48	642.60	
12 1	25	11:06	8	299	.700	1.88	646.350	63	58	35	252	248	101.91	646.28	
13 P13/5	0	11:22					646.570								LEAK CHECK 0.00 10 in
14 5	5	11:27	6	303	.480	1.79	649.665	61	59	[illegible]	254	248	100.79	649.64	
15 4	10	11:32	6	305	.730	1.30	652.745	63	59	33	293	250	100.11	652.74	
16 3	15	11:37	7	307	.810	1.97	656.520	65	60	32	305	252	99.60	656.54	
17 2	20	11:42	9	306	.920	2.19	660.540	[illegible]	60	32	258	251	99.58	660.52	
~~Average~~ Last 1	25	11:47	9	307	.490	2.49	664.255	69	61	32	254	250	99.71	664.77	LEAK CHECK 0.00 10 in

a) 120 minutes = minimum, 180 minutes = maximum, 5 min traverse point = minimum
b) <68 F
c) >248°F or Ts +27 F, whichever is greater
d) 1.0 dscm < vol < 2.5 dscm

EER

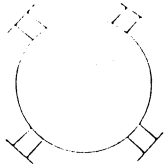
ONTARIO HYDRO METHOD FOR MERCURY

Plant: IPSC
City: DELTA
Location: INLET
Operator: JEFF D ROB Z
Date: 10-14-99
Run Number: RUN 4 SJ OHM
Stack Diam., inches: 1200
Assumed moisture, %: 80
Assumed O2%: 4

Sample Box Number: CA7
Meter Box Number: CA2
Meter Calibration (Y): 1.0062
Meter dH @: 1.7678
Pitot Tube No.: 63 Cp: .84
Probe Length: 20 TC No.: 2004
Probe Liner Material: TFE
Probe Heater Setting (°F): 248
CO2%: 13.8

Nozzle No.: C1 Diameter: .2550 (in.)
Filter Number: 99100107
Static Pressure (Pa): + 3.5 (in. H2O)
Barometric Pressure (Pb): 29.7 (in. Hg)
Ambient Temperature (°F): 70
Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)
Post Test Leak Rate: 0.00 cfm @ 12 (in. Hg)
Pitot Check: Pretest ✓ Post Test ✓

Sheet 2 of 2
Isokinetic Factor, K



P22	P28	P13	P18	P22
0	0	0	0	0

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1 P8 /5	0	12:08					664.945								LEAK CHECK 0.00CFM 10 IN HG
2 5	5	12:13	5	304	.300	0.82	667.420	65	65	49	249	246	100.73	667.40	
3 4	10	12:18	5	306	.850	0.82	669.900	68	65	36	307	249	100.93	669.88	
4 3	15	12:23	8	308	.760	2.31	673.995	71	66	35	300	248	99.22	674.03	
5 2	20	12:28	8	311	.570	2.07	677.900	72	66	35	272	250	99.76	677.91	
6 1	25	12:33	7	313	.530	1.55	681.305	74	67	34	252	253	100.41	681.29	LEAK CHECK 0.00 10 in
7 P2 /5	0	13:05					681.515								LEAK CHECK 0.00 10 in
8 5	5	13:10	5	303	.270	0.74	683.900	68	68	56	248	249	101.65	683.86	
9 4	10	13:15	5	305	.450	0.74	686.250	70	68	44	249	251	100.16	686.25	
10 3	15	13:20	5	306	.490	1.23	689.300	71	69	41	299	249	100.76	689.28	
11 2	20	13:25	6	306	.470	1.34	692.480	78	62	39	278	250	100.57	692.46	
12 1	25	13:30	6	306	.490	1.29	695.595	73	68	40	253	250	100.58	695.58	
13															
14															
15															
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >249°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

AVE ISO 100.44
SMPL VOL 78.71
VEL (FT/S) 55.13
FLOW (ACFM) 3969209

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: SCRUBBER INLET

Train Set No. ORANGE

Run No.: R4-SI-OHM-

Tared Filter # 99/00/07

Operator: B. ZIMMERMAN / L. DEAN

Run Time:

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	654.0	
				Initial	566.5	
				Wt. gain		
2	1 N KCL	100	MOD	Final	576.5	
				Initial	563.3	
				Wt. gain		
3	1 N KCL	100	G.S.	Final	573.3	
				Initial	571.8	
				Wt. gain		
4	5% HNO3/10% H2O2	100	MOD	Final	560.1	
				Initial	557.8	
				Wt. gain		
5	10% H2SO4/4% KMnO4	100	MOD	Final	593.1	
				Initial	593.8	
				Wt. gain		
6	10% H2SO4/4% KMnO4	100	MOD	Final	570.5	If not purple EOT suspect break through
				Initial	569.9	
				Wt. gain		
7	10% H2SO4/4% KMnO4	100	G.S	Final	599.0	
				Initial	598.7	
				Wt. gain		
8	Silica Gel	6"	MOD	Final	740.3	
				Initial	725.5	
				Wt. gain		1/8 SPENT

Train set up: Date: 10-14-99

Signature:

Train recovery: Date: 10/14-99

Signature:

EER

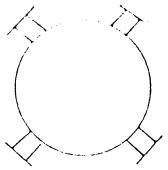
ONTARIO HYDRO METHOD FOR MERCURY

Plant: TPSC
City: DELTA
Location: INLET
Operator: J.D - B.Z.
Date: 10-12-99
Run Number: FIELD BLANK
Stack Diam., inches:
Assumed moisture, %:
Assumed O2%

Sample Box Number: C-22
Meter Box Number: C-22
Meter Calibration (Y): 1.0062
Meter dH @: 1.7678
Pitot Tube No.: G3 Cp: .84
Probe Length: 21' TC No.: 2004
Probe Liner Material: Teflon
Probe Heater Setting (°F)
CO2%

Nozzle No.: 19 Diameter: (in.)
Filter Number
Static Pressure (Pa) (in. H2O)
Barometric Pressure (Pb) (in. Hg)
Ambient Temperature (°F)
Pretest Leak Rate: 0.00 cfm @ 10 (in. Hg)
Post Test Leak Rate: 0.00 cfm @ 10 (in. Hg)
Pitot Check: Pretest Post Test

Sheet 1 of 1
Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0						347.905								
2							348.445								
3															
4					FIELD	BLANK									
5					LEAK	CHECKED	10	TIMES							
6					ALL	AT	10 in. Hg								
7					ALL	0.00	CFM								
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
Average/Total							0.5400								

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: JPS

Location: INLET

Run No.: ~~10-19-99 R1~~ FB-SI-CHM

Operator: BZ / JD

Run Time:

Train Set No. ORANGE

Tared Filter # 99100114

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	565.7	
				Initial	565.5	
				Wt. gain	.2	Clear
2	1 N KCL	100	MOD	Final	564.2	
				Initial	564.2	
				Wt. gain	0	
3	1 N KCL	100	G.S.	Final	570.1	
				Initial	570.2	
				Wt. gain	-.1	
4	5% HNO3/10% H2O2	100	MOD	Final	589.9	
				Initial	589.9	
				Wt. gain	0	
5	10% H2SO4/4% KMnO4	100	MOD	Final	578.5	
				Initial	578.5	
				Wt. gain	0	
6	10% H2SO4/4% KMnO4	100	MOD	Final	557.4	If not p[illegible] to E.O.T
				Initial	557.5	suspect steak through
				Wt. gain	-.1	
7	10% H2SO4/4% KMnO4	100	G.S	Final	582.1	
				Initial	582.1	
				Wt. gain	0	
8	Silica Gel	6"	MOD	Final	810.5	
				Initial	811.4	
				Wt. gain	-.9	-.9

Train set up: Date: 10-19-99

Signature: [illegible]

Train recovery: Date: 10-12-99

Signature: [illegible]

EER

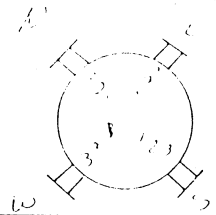
Stack

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	IPS	Sample Box Number	[illegible]	Nozzle No.	[illegible] Diameter [illegible] (in.)
City:	Delta	Meter Box Number	C 44	Filter Number	[illegible]
Location:	Scrubber outlet	Meter Calibration (Y)	[illegible]	Static Pressure (Pa)	[illegible] (in. H2O)
Operator:	[illegible]	Meter dH @	1.7936	Barometric Pressure (Pb)	[illegible] (in. Hg)
Date:	13 OCT 99	Pitot Tube No.	94 Cp [illegible]	Ambient Temperature (°F)	64
Run Number:	R02-30 CHM	Probe Length	11 TC No.	[illegible]	Pretest Leak Rate 0.003 cfm @ [illegible] (in. Hg)
Stack Diam., inches:	336	Probe Liner Material	[illegible]		Post Test Leak Rate [illegible] cfm @ [illegible] (in. Hg)
Assumed moisture, %:	12.3	Probe Heater Setting (°F)	270	Pitot Check: Pretest	[illegible] Post Test [illegible]
Assumed O2%	4.2	CO2%	11.2		

Sheet 1 of 1

Isokinetic Factor, K = [illegible]



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0						525.175								Filter temp
2 E-1	5	11:47	4.5	120	1.42	1.96	529.230	69	69	64	291	210	105	529.02	289
3 1b	10	11:52	4.5	120	1.38	1.91	532.950	71	69	49	285	216	98	533.03 ~~527.02~~	302
4 E-2	15	11:57	4.5	119	1.15	1.60	536.443	74	69	49	284	226	100.4	536.43	301
5 2b	20	12:02	4.5	119	1.20	1.67	539.875	76	69	51	282	227	96.4	540.00	302
6 E-3	25	12:07	4.5	118	1.12	1.57	543.300	79	71	54	283	232	99.3	543.34	310
7 3b	30	12:17	4.5	118	1.20	1.68	546.838	80	72	55	285	234	98.31	546.8	309
8		12:25			1.25		549.975	[illegible]	74	64	[illegible]	210			[illegible]
9 E-1	35	12:30	4.5	119	1.25	1.75	553.510	75	74	64	285	210	96.8	553.62	310
10 1b	40	12:35	4.0	119	1.25	1.76	557.210	81	74	57	282	224	100.6	557.18	311
11 E-2	45	12:40	4.0	118	1.20	1.70	557.875	84	75	56	286	232	101.5	557.82	311
12 2b	50	12:45	4.0	119	1.10	1.53	561.358	85	[illegible]	58	285	232	100.7	561.33	311
13 E-3	55	12:50	4	120	1.05	1.48	564.156	86	[illegible]	61	283	238	100.3	564.24	325
14 3b	60	12:55	4	117	1.05	1.47	566.155	[illegible]	[illegible]	63	[illegible]	242	[illegible]	568.15	327
15															
16															
17															
Average/Total															

Comments: 113 Start @ 0.5 lpm

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68 F
c) >248 F or Ts >27 F, whichever is greater
d) 1.0 dscm < vol < 2.5 dscm

11.13 [illegible]

EER

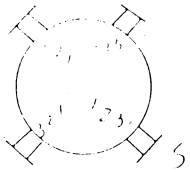
ONTARIO HYDRO METHOD FOR MERCURY

Plant: [illegible]
City: Delta
Location: Scrubber outlet
Operator: Jackson
Date: 1996.1.29
Run Number: R2-50-0Hg
Stack Diam., inches: 336
Assumed moisture, %: 12.3
Assumed O2%: 9.1

Sample Box Number: [illegible]
Meter Box Number: C.91
Meter Calibration (Y): 0.9873
Meter dH @: 1.9756
Pitot Tube No.: 79 Cp: 0.84
Probe Length: 12 TC No.: [illegible]
Probe Liner Material: Teflon
Probe Heater Setting (°F): 280
CO2%: 11.2

Nozzle No.: [illegible] Diameter: 0.2472 (in.)
Filter Number: [illegible]
Static Pressure (Pa): -4.25 (in. H2O)
Barometric Pressure (Pb): 29.56 (in. Hg)
Ambient Temperature (°F): 68
Pretest Leak Rate: .09 cfm @ 15 (in. Hg)
Post Test Leak Rate: .09 cfm @ 12 (in. Hg)
Pitot Check: Pretest: [illegible] Post Test: [illegible]

Sheet [illegible] of [illegible]
Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0						568.276								1/4
2 S-1	65	13:05	4	120	1.36	1.92	572.200	83	78	65	288	216	102	572.12	326
3 1b	70	13:10	4	120	1.35	1.91	576.051	86	79	56	289	246	1.2	576.01	327
4 S-2	75	13:15	4	120	1.30	1.85	579.760	88	80	55	285	241	18	579.68	327
5 2b	80	13:20	4	120	1.30	1.85	583.580	87	80	56	285	246	19	583.55	326
6 S-3	85	13:25	4	120	1.25	1.78	587.182	90	81	57	283	246		587.8	326
7 3b	90	13:30	4	120	1.25	1.78	590.860	90	81	57	282	233		590.90	327
8							591.108			60	~~325~~	~~210~~			305
9 W-1	95	14:50	4	121	1.50	2.11	595.195	80	79	60	285	210		595.13	311
10 1b	100	14:55	4	121	1.50	2.11	599.299	82	80	55	290	225	101.6	597.28	320
11 W-2	105	15:00	5	120	1.46	2.07	603.382	84	80	49	285	242	101.7	603.29	332
12 2b	110	15:05	4	121	1.43	2.03	607.381	87	80	51	286	245	102.3	607.34	333
13 W-3	115	15:10	4	121	1.20	1.71	611.024	90	81	51	285	247	101	611.02	333
14 3b	120	15:15	4	121	1.18	1.68	614.736	90	81	52	287	249	101.7	614.70	333
15															
16															O_2 = 4.5%
17															CO_2 = 10.7%
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

CO_2 = 10.6
0.4.4

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: Scrubber outlet

Run No.: R #2 - 50 - OHM

Operator: J. Jackson / M. Fukuda

Run Time: 11:47 - 15:15

Train Set No. Purple

Tared Filter # 99093010

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	732.6	
				Initial	584.0	
				Wt. gain	148.6	Clear
2	1 N KCL	100	MOD	Final	621.8	
				Initial	557.8	
				Wt. gain	64.0	
3	1 N KCL	100	G.S.	Final	586.6	
				Initial	573.1	
				Wt. gain	13.5	
4	5% HNO3/10% H2O2	100	MOD	Final	574.8	
				Initial	570.3	
				Wt. gain	4.5	
5	10% H2SO4/4% KMnO4	100	MOD	Final	597.0	
				Initial	595.5	
				Wt. gain	1.5	Purple
6	10% H2SO4/4% KMnO4	100	MOD	Final	562.3	If not purple at E.O.T.
				Initial	560.0	suspect break through
				Wt. gain	2.3	
7	10% H2SO4/4% KMnO4	100	G.S	Final	603.0	
				Initial	602.3	
				Wt. gain	.7	
8	Silica Gel	6"	MOD	Final	722.4	
				Initial	705.9	
				Wt. gain	16.5	1/4 blent

251.69 TOTAL

Train set up: Date: 10-13-99

Signature: [signature]

Train recovery: Date: 10-13-99

Signature: [signature]

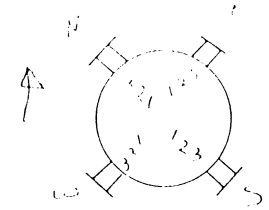
EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	[illegible]	Sample Box Number	[illegible]	Nozzle No.	[illegible] Diameter [illegible] (in.)
City:	[illegible]	Meter Box Number	[illegible]	Filter Number	[illegible]
Location:	[illegible]	Meter Calibration (Y)	[illegible]	Static Pressure (Pa)	[illegible] (in. H2O)
Operator:	[illegible]	Meter dH @	1.7956	Barometric Pressure (Pb)	[illegible] (in. Hg)
Date:	13 Oct 99	Pitot Tube No.	94 Cp	[illegible]	Ambient Temperature (°F) [illegible]
Run Number:	R3 SO-01A	Probe Length	11' TC No.	[illegible]	Pretest Leak Rate [illegible] cfm @ [illegible] (in. Hg)
Stack Diam., inches:	336	Probe Liner Material	TFE		Post Test Leak Rate [illegible] cfm @ [illegible] (in. Hg)
Assumed moisture, %:	12.3	Probe Heater Setting (°F)	[illegible]		Pilot Check: Pretest [illegible] Post Test [illegible]
Assumed O2%	4.4 %	CO2%	10.6 %		

Sheet 1 of [illegible]

Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0						615.690								Leak
2 S-1	5	17:15	5	121	1.55	2.18	619.950	81	80	52	297	240	103.9	619.8	324 Stop 43
3 1b	10	17:20	6	121	1.50	2.11	624.050	82	80	47	285	263	101.5	623.95	324
4 S-2	15	17:25	6	120	1.47	2.08	628.[illegible]	84	80	46	285	257	.4	628.06	306
5 2b	20	17:30	5	120	1.47	2.09	632.061	86	81	45	285	251	99.4	632.10	305
6 S-3	25	17:35	5	120	1.25	1.78	635.791	89	81	47	280	250	.25	635.78	307 Stop 43
7 3b	30	17:40	5	120	1.25	1.78	639.478	90	82	48	270	250	98.7	639.52	306 Leak
8							639.634			64	287	220			306
9 W-1	35	17:55	5	120	1.41	2.00	643.675	85	82	64	287	220		643.57	305 Stop 43
10 1b	40	18:02	5	120	1.35	1.92	647.525	87	83	57	282	235		[illegible]	305
11 W 2	45	18:05	6	120	1.20	1.71	651.188	90	84	58	285	221	99.0	651.38	304
12 2b	50	18:10	6	120	1.30	1.86	654.785	90	84	59	277	220		654.85	316
13 W-3	55	18:15	6	120	1.10	1.58	658.251	93	85	61	279	230	97	658.58	327 Stop 43
14 3b	60	18:20	5	120	1.15	1.65	661.283	93	85	61	283	239		661.77	327 Leak
15														665 [illegible]	
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

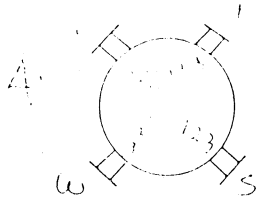
EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	LPS	Sample Box Number	A-C-91	Nozzle No.	P6 Diameter 0.2042 (in.)
City:	Delta	Meter Box Number	C-A-9	Filter Number	97053.002
Location:	Scrubber Outlet	Meter Calibration (Y)	0.9992	Static Pressure (Pa)	0.25 (in. H2O)
Operator:	Jackson	Meter dH @	1.29.56	Barometric Pressure (Pb)	29.56 (in. Hg)
Date:	13 Oct 99	Pitot Tube No.	94 Cp 0.84	Ambient Temperature (°F)	70
Run Number:	R3-50 cfm	Probe Length	11' TC No.	Pretest Leak Rate	.018 cfm @ 10 (in. Hg)
Stack Diam., inches:	336	Probe Liner Material	Tef	Post Test Leak Rate	.006 cfm @ 11 (in. Hg)
Assumed moisture, %:	12.3	Probe Heater Setting (°F)	285	Pitot Check: Pretest	✓ Post Test ✓
Assumed O2%	4.4	CO2%	10.6		

Sheet 2 of 2

Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp. (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0	18:40					662.525								Filts Std By
2 N-1	65	18:20	6	120	1.25	1.77	666.310	83	83	58	285	225	102.1	666.23	276
3 1b	70	19:25	5	121	1.20	1.70	669.850	84	83	49	288	230	99.4	669.74	287 Start M3
4 N-2	75	19:30	5	120	1.15	1.64	673.338	87	83	47	289	231	97.71	673.42	304
5 2b	80	19:35	5	120	1.20	1.71	676.900	89	83	47	287	235	97.5	676.99	318
6 N-3	89	19:40	5	120	1.15	1.64	680.545	90	84	51	290	233	101.7	680.48	328 End M3
7 3b	90	19:45	5	120	1.15	1.65	684.164	92	84	54	287	233	.8	684.13	332
8							684.328				277				3 (Leak 0.001)
9 E-1	95	20:32	5	120	1.40	1.98	688.420	82	81	60	277	221	104.6	688.29	335
10 1b	100	20:37	6	120	1.42	2.01	692.112	83	82	58	276	252	104.2	692.87	339 Start M3
11 E-2	105	20:42	6	120	1.40	1.97	696.550	86	84	54	281	246	.3	696.34	322
12 2b	110	20:47	6	119	1.30	1.85	700.1[illegible]	87	81	55	275	240	[illegible]	[illegible]19	321 End M3
13 E-3	115	20:52	6	119	1.14	1.63	703.682	70	[illegible]	60	[illegible]	[illegible]	.5	703.66	321
14 3b	120	20:57	5	120	1.14	1.63	707.251	94	[illegible]	60	[illegible]	247	.3	707.28	322
15															
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum

b) <68°F

c) >248°F or Ts ±27°F, whichever is greater

d) 1.0 dscm < vol < 2.5 dscm

[illegible] Filts Out temp. [illegible] Std (Average).

EER

O_2 = 4.4

CO_2 = 10.6

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: ~~R3-50-OHM~~ SCRUBBER OUTLET

Train Set No. Lt - Green

Tared Filter # 99093002

Run No.: R3-50-OHM

Operator: J. Jackson / M. Fukuda

Run Time:

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	716.2	
				Initial	564.3	
				Wt. gain		Clear
2	1 N KCL	100	MOD	Final	639.1	
				Initial	589.2	
				Wt. gain		
3	1 N KCL	100	G.S.	Final	582.7	
				Initial	568.0	
				Wt. gain		
4	5% HNO3/10% H2O2	100	MOD	Final	566.1	
				Initial	559.8	
				Wt. gain		
5	10% H2SO4/4% KMnO4	100	MOD	Final	593.7	
				Initial	593.2	
				Wt. gain		Purple
6	10% H2SO4/4% KMnO4	100	MOD	Final	577.8	If not purple @ E.O.T. suspect break through
				Initial	576.5	
				Wt. gain		
7	10% H2SO4/4% KMnO4	100	G.S	Final	605.5	
				Initial	605.3	
				Wt. gain		
8	Silica Gel	6"	MOD	Final	778.5	
				Initial	760.[illegible]1	
				Wt. gain		1/2 spent

Train set up: Date: 10-13-99

Signature: [illegible]

Train recovery: Date:

Signature:

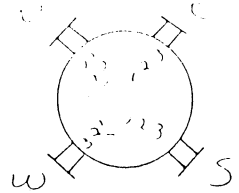
EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	IPS	Sample Box Number	[illegible]	Nozzle No.	P6 Diameter 0.2043 (in.)
City:	Delta	Meter Box Number	C49	Filter Number	29 0 3 0 3
Location:	Scrubber outlet	Meter Calibration (Y)	0.9992	Static Pressure (Pa)	[illegible] (in. H2O)
Operator:	Jackson	Meter dH @	1.7950	Barometric Pressure (Pb)	28.56 (in. Hg)
Date:	14 Oct 97	Pitot Tube No.	94 Cp 0.84	Ambient Temperature (°F)	[illegible]
Run Number:	R4-SO 0441	Probe Length	11' TC No.	Pretest Leak Rate	.005 cfm @ [illegible] (in. Hg)
Stack Diam., inches:	336	Probe Liner Material	TFE	Post Test Leak Rate	.002 cfm @ 9" (in. Hg)
Assumed moisture, %:	18	Probe Heater Setting (°F)	250	Pitot Check: Pretest	✓ Post Test ✓
Assumed O2%	11.1	CO2%	10.9		

Sheet 2 of 2

Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0						752.167								
2 W-1	65	12:55	5	120	1.40	1.98	756.140	76	75	46	287	225	102.3	756.05	328
3 1b	70	13:00	ϕ	120	1.40	1.98	760.065	77	75	43	288	239	101.1	760.03	328
4 W-2	75	13:05	ϕ	120	1.40	1.98	763.985	81	75	42	284	243	100.51	763.97	329
5 2b	80	13:10	ϕ	120	1.31	1.86	767.660	83	76	43	284	230	97.11	767.77	329
6 W-3	85	13:15	ϕ	120	1.15	1.64	771.182	84	77	46	279	225		771.31	327
7 3b	90	13:20	ϕ	120	1.15	1.64	774.651	85	77	47	281	228		774.65	328
8							774.875								
9 S-1	95	13:05	ϕ	120	1.52	2.15	778.278	77	78	56	278	[illegible]	101.4	778.93	328
10 1b	100	13:10	5	120	1.52	2.16	783.100	[illegible]	78	53	285	231		783.66	327
11 S-2	105	13:15	ϕ	120	1.50	2.14	787.123	84	78	46	284	231		787.16	330
12 2b	110	13:20	ϕ	120	1.50	2.14	791.130	86	[illegible]	47	287	231	[illegible]	791.24	327
13 S-3	115	13:25	ϕ	120	1.20	1.72	794.122	87	77	51	287	231	[illegible]	794.28	327
14 3b	120	13:30	ϕ	121	1.20	1.72	798.428	87	[illegible]	[illegible]	286	231		798.43	330
15		13:35	ϕ												
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts ±27°F, whichever is greater
d) 1.0 dscm < vol < 2.5 dscm

EER

FB

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: SCRUBBER OUTLET

Run No.: ~~FB1~~ FB - SO-OHM

Operator: J.J. / M.F.

Run Time: Stack Feild Blank

Train Set No. Purple

Tared Filter # ~~99093001~~ 99093001

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	585.4	
				Initial	585.4	
				Wt. gain	-0.4	-0.4
2	1 N KCL	100	MOD	Final	556.7	
				Initial	556.7	
				Wt. gain	0	0
3	1 N KCL	100	G.S.	Final	575.2	
				Initial	575.4	
				Wt. gain	-0.2	-0.2
4	5% HNO3/10% H2O2	100	MOD	Final	571.0	
				Initial	571.0	
				Wt. gain	0	0
5	10% H2SO4/4% KMnO4	100	MOD	Final	587.6	
				Initial	587.7	
				Wt. gain	-0.1	-0.1
6	10% H2SO4/4% KMnO4	100	MOD	Final	557.1	If not purple @ E.O.T. suspect break through
				Initial	557.2	
				Wt. gain	-0.1	-0.1
7	10% H2SO4/4% KMnO4	100	G.S	Final	599.3	
				Initial	599.4	
				Wt. gain	-0.1	-0.1
8	Silica Gel	6"	MOD	Final	757.1	
				Initial	756.2	
				Wt. gain	0.9	0.0

Train set up: Date:

Signature:

Train recovery: Date:

Signature:

EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	IPP	Sample Box Number	CA4/CA1	Nozzle No.	PC
City:	Delta	Meter Box Number	CA4	Filter Number	7701301
Location:	Stack	Meter Calibration (Y)	0.9772	Static Pressure (Pa)	[illegible] (in. H2O)
Operator:	JS	Meter dH @	1.7956	Barometric Pressure (Pb)	[illegible] (in. Hg)
Date:	12 OCT 97	Pitot Tube No.	94 Cp 0.81	Ambient Temperature (°F)	[illegible]
Run Number:	Field Blank	Probe Length	11 TC No.	Pretest Leak Rate	cfm @ (in. Hg)
Stack Diam., inches:	336	Probe Liner Material	TFE	Post Test Leak Rate	cfm @ (in. Hg)
Assumed moisture, %:	12 ~~5~~ 13?	Probe Heater Setting (°F)	250	Pitot Check: Pretest	✓ Post Test ✓
Assumed O2%	6.0	CO2%	12.5		

Diameter (in.)

Sheet 1 of 1

Isokinetic Factor, K

See Below

Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp. (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments
1	0														
2	Leak ✓	09.00	18"				380.690								0.012 ft³
3	↓		14"				380.810								0.005 ↓
4	↓ ✓		10"				380.958								0.006 ↓
5	↓		10"				381.195								0.007 ↓
6	↓ ✓		10"				381.255								0.005 ↓
7	↓ ✓		10"				381.395								0.005 ↓
8	↓ ✓		10"				381.550								0.005 ↓
9	↓ ✓		10"				381.675								0.005 ↓
10		09.38					381.800								
11															
12															
13															
14															
15															
16															
17															
Average/Total															

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68 F
c) >248 F or Ts ±27 F, whichever is greater
d) 1.0 dscm < vol < 2.5 dscm

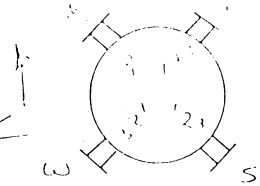
EER

ONTARIO HYDRO METHOD FOR MERCURY

Plant:	[illegible]	Sample Box Number:	[illegible]	Nozzle No.: [illegible]	Diameter: 0.2642 (in.)
City:	Detroit	Meter Box Number:	C-44	Filter Number:	79 093003
Location:	Scrubber Inlet	Meter Calibration (Y):	0.9772	Static Pressure (Pa):	[illegible] (in. H2O)
Operator:	Jackson	Meter dH @:	1.79.56	Barometric Pressure (Pb):	29.56 (in. Hg)
Date:	14 Oct 99	Pitot Tube No.:	99	Cp:	0.84
Run Number:	R11-50 CHM	Probe Length:	11'	TC No.:	11 TC
Stack Diam., inches:	336	Probe Liner Material:	Teflon	Pretest Leak Rate:	0.02 cfm @ 7" (in. Hg)
Assumed moisture, %:	12.3	Probe Heater Setting (°F):	290	Post Test Leak Rate:	____ cfm @ ____ (in. Hg)
Assumed O2%	4.4	CO2%	10.9	Pitot Check: Pretest: ✓	Post Test: ✓

Sheet 1 of 7

Isokinetic Factor, K



Traverse Point No.	Sampling Time, (Min.) (a)	Clock Time (24 h)	Vacuum (in. Hg)	Stack Temp, Ts (°F)	Velocity Head, dP (in. H2O)	Pressure Differential Across Orifice dH (in. H2O)	Gas Sample Volume, Vm (cf)	Dry Gas Meter Inlet Temp, Tm (°F)	Dry Gas Meter Outlet Temp, Tm (°F)	Impinger Outlet Temp. (°F) (b)	Probe Exit Temp (°F) (c)	Filter Exit Temp (°F) (c)	Isokinetic Rate (%)	Target Volume (cf) (d)	Comments	
1	0	10:05					707.518								Filter	Start-1
2 E-1	5	~~10:5~~ 10:10	5	120	1.45	2.01	711.451	66	66	61	287	224	101.4	711.4	329	
3 1b	10	10:15	↓	119	1.50	2.08	715.489	67	66	58	284	245	102.1	715.4	329	Stat 2-3
4 E-2	15	10:20	↓	118	1.43	2.0	719.395	72	66	48	285	253	0.6	719.37	328	
5 2b	20	10:25	↓	117	1.40	1.96	723.250	73	67	46	283	232	.07	723.25	329	
6 E-3	25	10:30	↓	118	1.10	1.55	726.671	76	68	46	287	250	99.79	726.68	329	
7 3b	30	10:35	↓	118	1.10	1.55	730.050	77	69	46	287	249	98.4	730.11	329	Stop 1-3
8							730.483	~~72~~	~~70~~	61	~~287~~				~~329~~	(Leak 1.022)
9 N-1	35	10:55	↓	118	1.30	1.82	734.218	72	70	61	287	223	.48	734.20	328	
10 1b	40	11:00	↓	118	1.30	1.83	737.938	75	72	52	284	245	99.61	737.95	328	Start 1-3
11 N-2	45	11:05	↓	118	1.22	1.73	741.551	79	72	46	285	249	99.47	741.57	328	
12 2b	50	11:10	↓	118	1.30	1.85	745.250	81	74	47	284	246	98.3	745.31	330	
13 N-3	55	11:15	↓	118	1.10	1.57	748.642	83	74	49	284	246	97.8	748.22	328	End 1-3
14 3b	60	11:20	↓	118	1.10	1.57	752.194	83	75	50	285	246		752.12	328	Leak 1.021
15		11:25														
16																
17																
Average/Total																

a) 120 minutes = minimum, 180 minutes = maximum, 5 min/traverse point = minimum
b) <68°F
c) >248°F or Ts 127°F, whichever is greater
d) 1.0 dscm < vol <2.5 dscm

EER

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Plant/city: IPS

Location: SCRUBBER OUTLET

Train Set No. Purple

Run No.: 24-SC-CHM

Tared Filter # 99 093003

Operator: J. JACKSON / M. FUKUDA

Run Time:

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	1 N KCL	100	MOD	Final	731.9	
				Initial	589.0	
				Wt. gain		CLEAR
2	1 N KCL	100	MOD	Final	635.9	
				Initial	560.1	
				Wt. gain		
3	1 N KCL	100	G.S.	Final	583.2	
				Initial	575.45	
				Wt. gain		
4	5% HNO3/10% H2O2	100	MOD	Final	575.2	
				Initial	573.3	
				Wt. gain		
5	10% H2SO4/4% KMnO4	100	MOD	Final	595.6	
				Initial	595.5	
				Wt. gain		Purple
6	10% H2SO4/4% KMnO4	100	MOD	Final	560.3	If not purple @ E.O.T. suspect break through
				Initial	559.9	
				Wt. gain		
7	10% H2SO4/4% KMnO4	100	G.S	Final	603.4	
				Initial	602.2	
				Wt. gain		
8	Silica Gel	6"	MOD	Final	813.2	
				Initial	796.2	
				Wt. gain		1/8 SPENT

Train set up: Date: 10-14-99

Signature: [signature]

Train recovery: Date: 10-14-99

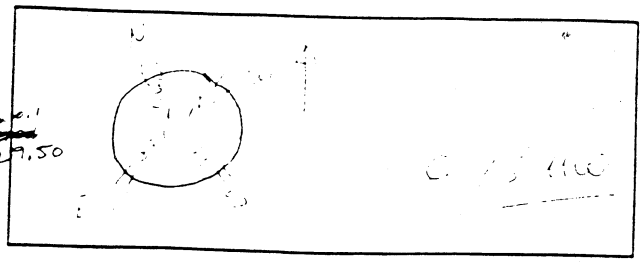
Signature: [signature]

EER

Preliminary Velocity Data

PRELIMINARY VELOCITY TRAVERSE

PLANT IPSCI
DATE 10/11/99
LOCATION Stack
STACK I.D. Unit #2
PITOT NO./Cp 84/0.84 TC# 11' Probe
BAROMETRIC PRESSURE, In Hg 29.80 = 29.50
STATIC GAUGE PRESSURE, In H20 -0.78
OPERATORS JJ / MF
PITOT PRE TEST LEAK CHECK ✓
PITOT POST TEST LEAK CHECK ✓



SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	CLOCK 24 HR TIME	VELOCITY HEAD (Ps) In. H20	STACK TEMP (Ts)°F	SWIRL ANGLE
E 1	15:49	1.40	118	↷ 4°
2	1-00	1.35	120	↷ 4°
3	16:03	1.20	120	↷ 6°
W 1	16:05	1.41	120	↷ 6°
2	16:08	1.32	120	↷ 4°
3	16:10	1.18	120	↷ 6°
W 1	[illegible]	1.38	120	↷ 8°
2	[illegible]	1.30	121	↷ 4°
3	16:20	1.21	121	↷ 3°
S-1	16:25	1.55	120	↷ 10°
2	16:27	1.35	121	↷ 5°
3	16:28	1.20	121	↷ 8
AVERAGE		1.32	120.2	↷ 5.6°

TRAVERSE POINT NUMBER	CLOCK 24 HR TIME	VELOCITY HEAD (Ps) In. H20	STACK TEMP (Ts)°F	SWIRL ANGLE
Vel =	[illegible]	$C_p \cdot \sqrt{\Delta p} \cdot \sqrt{T_s / M_s}$		
Vel (Act):				
AVERAGE				

SWIRL ACCEPTANCE LIMITS

Average(abs. value) less than 10°
No points with reverse flow
No more than 4 points above 30°

ΔP MINIMUM LIMITS

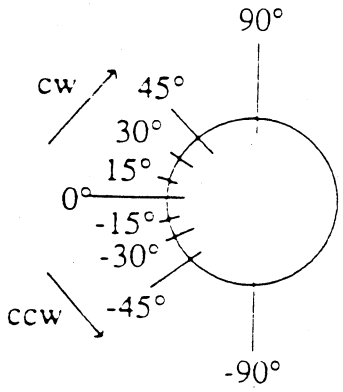
Conditions for more sensitive manometer
1. For 12 or more points on a velocity traverse: 10% of the points's Δp < 0.05"
2. For <12 points on a velocity traverse more than 1 point's Δp <0.05"

Rt Mean Avg Δp =

$$\left[\frac{\sum_{1}^{N}(\Delta p_{si})^{1/2}}{N}\right]^2$$

Rt Mean Avg Ts =

$$\left[\frac{\sum_{1}^{N}(T_{si})^{1/2}}{N}\right]^2$$



EER

KEEP

SPRE-1

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Train Set No. _____

Tared Filter # _____

Prelim Moisture Outlet/Stack

Plant/city: IPS

Location: STACK

Run No.: pre-lim

Operator: J.J./MF

Run Time: _____

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	~~1N KCL~~ DIH2O	100	MOD	Final	668.5	
				Initial	618.8	
				Wt. gain	49.7	
2	~~1N KCL~~ DIH2O	100	MOD	Final	622.1	
				Initial	615.7	
				Wt. gain	6.40	
3	~~1N KCL~~ Empty	100	G.S.	Final	454.7	
				Initial	452.3	
				Wt. gain	2.4	
4	~~5% HNO3/10% H2O2~~	~~100~~	~~MOD~~	Final		
				Initial		
				Wt. gain		
5	~~10% H2SO4/4% KMnO4~~	~~100~~	~~MOD~~	Final		
				Initial		
				Wt. gain		
6	~~10% H2SO4/4% KMnO4~~	100	MOD	Final		If not purple @ E.O.T. suspect break through
				Initial		
				Wt. gain		
7	~~10% H2SO4/4% KMnO4~~	100	G.S	Final		
				Initial		
				Wt. gain		
8	Silica Gel	6"	MOD	Final	807.2	
				Initial	799.9	
				Wt. gain	7.3	65.80g

Train set up: Date: 10-11-99

Signature: [signature]

Train recovery: Date: 10-11-99

Signature: [signature]

EER

PRELIMINARY VELOCITY TRAVERSE

PLANT [illegible]
DATE [illegible]
LOCATION [illegible]
STACK I.D. _____
PITOT NO./Cp 67 TC# _____
BAROMETRIC PRESSURE, In Hg 29.70
STATIC GAUGE PRESSURE, In H20 + 3.5
OPERATORS [illegible]
PITOT PRE TEST LEAK CHECK ✓
PITOT POST TEST LEAK CHECK ✓

TRAVERSE POINT NUMBER	CLOCK 24 HR TIME	VELOCITY HEAD (Ps) In. H20	STACK TEMP (Ts)°F	SWIRL ANGLE
P13/1	16 20	.470	314	
2		.680	319	
3		.470	312	
4		.360	317	
5		.330	317	
6		.420	318	
P13/6	16 35	.260	318	
5		.170	311	
4		.370	310	
3		.540	312	
2		.520	312	
1		.240	317	
P22/6	16 45	.125	303	
5		.135	307	
4		.320	308	
AVERAGE				

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	CLOCK 24 HR TIME	VELOCITY HEAD (Ps) In. H20	STACK TEMP (Ts)°F	SWIRL ANGLE
2		[illegible]	[illegible]	
2		[illegible]	[illegible]	
1		[illegible]	[illegible]	
P8/6	[illegible]	[illegible]	[illegible]	
5		.205	[illegible]	
4		[illegible]	[illegible]	
3		[illegible]	[illegible]	
2		[illegible]	[illegible]	
1		[illegible]	[illegible]	
P2/6	[illegible]	[illegible]	[illegible]	
5		[illegible]	[illegible]	
4		[illegible]	[illegible]	
3		[illegible]	[illegible]	
2		[illegible]	[illegible]	
1		[illegible]	[illegible]	
AVERAGE				

SWIRL ACCEPTANCE LIMITS

Average(abs. value) less than 10°
No points with reverse flow
No more than 4 points above 30°

ΔP MINIMUM LIMITS

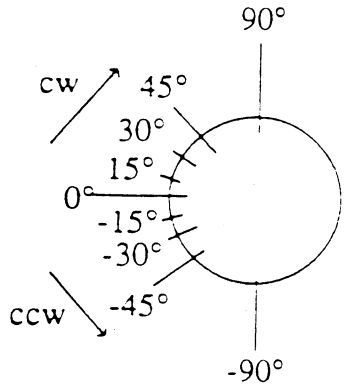
Conditions for more sensitive manometer
1. For 12 or more points on a velocity traverse: 10% of the points's Δp < 0.05"
2. For <12 points on a velocity traverse more than 1 point's Δp <0.05"

Rt Mean Avg Δp =

$$\left[\frac{\sum_{1}^{N}(\Delta p_{si})^{1/2}}{N}\right]^2$$

Rt Mean Avg Ts =

$$\left[\frac{\sum_{1}^{N}(Ts_{i})^{1/2}}{N}\right]^2$$



EER

KEEP

EPA METHOD 3 DRY MOLECULAR WEIGHT DETERMINATION BY FYRITE ANALYSIS

Plant: ~~IMPSC~~ IMPP

Date: 10/11/99 10 Oct-99

Sampling Time (24 hr clock): 6:05

Sampling Location: Inlet

Sample Type (Bag, Integrated, Continuous): Moisture

Analytical Method:

Ambient Temperature:

Operator:

Comments: MOISTURE DATA

21-May-99
by TPM

Run / Gas	1			2			3			
	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	**Average MW***
O2		44/100			44/100			44/100		
CO2		32/100			32/100			32/100		
N2 = 100 minus O2 and CO2		28/100			28/100			28/100		
Dry Stack Gas MW = ∑MWi (lb/lbmole)		**MW1 =**			**MW2 =**			**MW3 =**		**MWavg =** = Avg (MW1, MW2, MW3)

* Three individual MWs should not differ from MWavg by more than 0.3 lb/lbmole. Repeat measurements must be made until three MWs meet this criteria.

		T_1	T_2	T_E
6:05	325.5	80	80	60
6:20		84	80	54
6:35	342.745	88	81	58

Figure 5-1. EPA Method 3 datasheet.

SI - PRE-1

PRE-SI-1

IMPINGER WEIGHT SHEET
FOR HG SAMPLING (ONTARIO HYDRO)

Train Set No. _____ Preliminary Moisture Inlet

Tared Filter # _____

Plant/city: IPS

Location: Scrubber Inlet

Run No.: Pre-Lim - SI - M4

Operator: BZ - JD

Run Time: _____

Impinger No.	Solution Used	Solution (ml)	Configuration		Weight (grams)	Inspection Comments
1	~~1 N KCL~~ DI H2O	100	MOD	Final	689.7	
				Initial	668.5	
				Wt. gain	21.20	
2	~~1 N KCL~~ DI H2O	100	MOD	Final	627.0	
				Initial	~~[illegible]~~ 622.1	
				Wt. gain	4.9	
3	~~1 N KCL~~ Empty	~~100~~ Ø	G.S.	Final	456.4	
				Initial	454.7	
				Wt. gain	1.7	
4	~~5% HNO3/10% H2O2~~	~~100~~	~~MOD~~	Final		
				Initial		
				Wt. gain		
5	~~10% H2SO4/4% KMnO4~~	~~100~~	~~MOD~~	Final		
				Initial		
				Wt. gain		
6	~~10% H2SO4/4% KMnO4~~	~~100~~	~~MOD~~	Final		If not purple @ E.O.T. suspect break through
				Initial		
				Wt. gain		
7	~~10% H2SO4/4% KMnO4~~	~~100~~	~~G.S~~	Final		
				Initial		
				Wt. gain		
8	Silica Gel	6"	MOD	Final	811.8	
				Initial	807.2	
				Wt. gain	4.6	32.40

Train set up: Date: 10-11-99

Signature: [illegible]

Train recovery: Date: _____

Signature: _____

EER

Fyrite Data

EPA METHOD 3 DRY MOLECULAR WEIGHT DETERMINATION BY FYRITE ANALYSIS

Plant: IPSC IPP
Date: 13 OCT 1999
Sampling Time (24 hr clock):
Sampling Location: STACK
Sample Type (Bag, Integrated, Continuous):
Analytical Method: FYRITE
Ambient Temperature:
Operator: MF / JJ

Comments: Run 2 - 50

Max Δ = 0.021 lb/mole

- Simultaneous w/ OHM 50 Run 2
- Int. Bag @ 0.5 LPM.

21-May-99
by TPM

Gas \ Run	1			2			3			
	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Average MW*
O2	4.4	44/100	1.41	4.6	44/100	1.47	4.4	44/100	1.41	4.5
CO2	10.7	32/100	4.71	10.8	32/100	4.75	10.6	32/100	4.66	10.7
N2 = 100 minus O2 and CO2	84.9	28/100	23.77	84.6	28/100	23.69	85.0	28/100	23.80	84.8
Dry Stack Gas MW = ΣMWi (lb/lbmole)		MW1 =	29.89		MW2 =	29.91		MW3 =	29.87	MWavg = 29.89 = Avg (MW1, MW2, MW3)

* Three individual MWs should not differ from MWavg by more than 0.3 lb/lbmole. Repeat measurements must be made until three MWs meet this criteria.

Figure 5-1. EPA Method 3 datasheet.

50-2

EPA METHOD 3 DRY MOLECULAR WEIGHT DETERMINATION BY FYRITE ANALYSIS

Plant: IPSC - IPP
Date: 13 OCT 1999
Sampling Time (24 hr clock): 17:10 - 21:02
Sampling Location: STACK
Sample Type (Bag, Integrated, Continuous)
Analytical Method: Fyrite
Ambient Temperature: 70
Operator: M. Farrar / D. Jarrard

Comments: for Run 3 - 50 - ohm
o Stabilization w/ ohm Run 3-50
o Int. Tl Bag @ 0.71 LPM

21-May-99
by TPM

Gas \ Run	1 Reading (%)	1 MW Multiplier	1 lb/lbmole (MWi)	2 Reading (%)	2 MW Multiplier	2 lb/lbmole (MWi)	3 Reading (%)	3 MW Multiplier	3 lb/lbmole (MWi)	Average MW*
O2	4.4	44/100	1.41	4.4	44/100	1.41	4.2	44/100	1.34	4.3
CO2	10.8	32/100	4.75	10.9	32/100	4.80	10.8	32/100	4.75	10.8
N2 = 100 minus O2 and CO2	84.8	28/100	23.74	84.7	28/100	23.72	85.0	28/100	23.80	84.8
Dry Stack Gas MW = ΣMWi (lb/lbmole)		MW1 =	~~28.~~ 29.90		MW2 =	29.93		MW3 =	29.89	MWavg = 29.91 = Avg (MW1, MW2, MW3)

* Three individual MWs should not differ from MWavg by more than 0.3 lb/lbmole. Repeat measurements must be made until three MWs meet this criteria.

Figure 5-1. EPA Method 3 datasheet.

EPA METHOD 3 DRY MOLECULAR WEIGHT DETERMINATION BY FYRITE ANALYSIS

Plant: IPSC - IPP
Date: 14 OCT. 1999
Sampling Time (24 hr clock): 10:05 ~ 13:30
Sampling Location: STACK
Sample Type (Bag, Integrated, Continuous)
Analytical Method: FYRITE
Ambient Temperature: 70°
Operator: Fukuda / J. JACKSON

Comments: Run 4-50-M3
- Simultaneous w/ R4-50-OHM
- 1 Ar. TEDLAR Bag @ 0.5 LPM.

21-May-99
by TPM

Gas \ Run	1			2			3			
	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Reading (%)	MW Multiplier	lb/lbmole (MWi)	Average MW*
O2	5.1	44/100	1.63	5.1	44/100	1.63	5.1	44/100	1.63	1.63
CO2	10.6	32/100	4.66	10.6	32/100	4.66	10.4	32/100	4.58	10.5
N2 = 100 minus O2 and CO2	84.3	28/100	23.60	84.3	28/100	23.60	84.5	28/100	23.66	84.4
Dry Stack Gas MW = ∑MWi (lb/lbmole)		MW1 =	29.89		MW2 =	29.89		MW3 =	29.87	MWavg = 29.88 = Avg (MW1, MW2, MW3)

* Three individual MWs should not differ from MWavg by more than 0.3 lb/lbmole. Repeat measurements must be made until three MWs meet this criteria.

Max Δ = 0.01

Figure 5.1. EPA Method 3 datasheet

Preliminary Velocity Data

PRELIMINARY VELOCITY DATA

PLANT: IPSC IPP

TEST DATE: 11 October 1999

CITY: Delta, UT

SAMPLE LOCATION: INLET

OPERATOR: JD, BZ

ENTERED BY: MF

CHECKED BY:

DATA ENTRY	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			1	2	3
ROUND STACK, DIAMETER	ds	inches			
RECTANGULAR STACK, LENGTH	L	inches	288.000		
WIDTH	W	inches	600.000		
NOZZLE DIAMETER	dn	inches			
AVERAGE STACK TEMPERATURE	Fs	degrees F	311.5	0.000	0.000
AVERAGE METER TEMPERATURE	Fm	degrees F	86.000	#DIV/0!	#DIV/0!
STANDARD TEMPERATURE(68°(EPA),60°(AQMD))	Tstd	degrees F	68.000		
BAROMETRIC PRESSURE	Pbar	in. Hg	29.800		
STACK STATIC PRESSURE	Pg	in. H20	3.500		
AVG. DELTA H	dH	in. H20	1.800	#DIV/0!	#DIV/0!
AVG. VELOCITY HEAD	dP	in. H20	0.394	0.000	0.000
PITOT COEFFICIENT	Cp	-	0.840		
GAS SAMPLE VOLUME	Vm	cubic ft.	22.245	0.000	0.000
METER CALIBRATION FACTOR	Y	-	0.999		
TOTAL SAMPLING TIME	min	minutes	30.000		
STACK GAS OXYGEN CONTENT	Co2.m	%	5.000		
STACK GAS CARBON DIOXIDE CONTENT	Cco2.m	%	13.500		
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	37.700	0.000	0.000

PRELIMINARY VELOCITY DATA

PLANT: IPSC IPP

TEST DATE: 11 October 1999

CITY: Delta, UT

SAMPLE LOCATION: INLET

OPERATOR: JD, BZ

ENTERED BY: MF

CHECKED BY:

CALCULATED DATA	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			1	2	3
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000	0.000	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND)	As	sq. feet	0.000	0.000	0.000
= L * W/144 (RECTANGULAR)			1200.000	0.000	0.000
STANDARD TEMPERATURE(528 (EPA),520 (AQMD))	Tstdr	degrees R	528.000	460.000	460.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	771.480	460.000	460.000
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	546.000	#DIV/0!	#DIV/0!
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	21.490	#DIV/0!	#DIV/0!
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528) *Ww	VwStd	cubic ft.	1.775	0.000	0.000
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.076	#DIV/0!	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2.m)+ 0.44(Cco2.m)+0.28[100-(C02.m)-(Cco2.m)]	Md	g/g-mole	30.360	28.000	28.000
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	29.417	#DIV/0!	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	30.057	0.000	0.000
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts)/(Ps*Mw)] }	vs	ft/s	42.122	#DIV/0!	#DIV/0!
vsm = 0.3048 * vs	vsm	m/s	12.839	#DIV/0!	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	3032766	#DIV/0!	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64 (Tstdr/528) Q (1-Bws) (Ps/Ts)	Qsd	dscf/min	1925333.8	#DIV/0!	#DIV/0!
Qsdm = Qsd/35.32	Qsdm	dscm/min	54511.150	#DIV/0!	#DIV/0!

Test Date
Run 1

Stack Temp (°F)	Stack Temp (°F) (sqrt)	Velocity, dP (in. H2O)	Velocity, dP (in. H2O) (sqrt)	dH (in H2O)	DGM In Temp values (°F)	DGM Out Temp values (°F)
307	17.5	0.135	0.37	1.8	88	84
308	17.5	0.38	0.62			
308	17.5	0.45	0.67			
310	17.6	0.43	0.66			
312	17.7	0.37	0.61			
310	17.6	0.305	0.55			
313	17.7	0.585	0.76			
314	17.7	0.515	0.72			
316	17.8	0.405	0.64			
319	17.9	0.44	0.66			
304	17.4	0.17	0.41			
304	17.4	0.27	0.52			
304	17.4	0.33	0.57			
305	17.5	0.31	0.56			
305	17.5	0.26	0.51			
319	17.9	0.68	0.82			
318	17.8	0.67	0.82			
317	17.8	0.86	0.93			
317	17.8	0.33	0.57			
310	17.6	0.42	0.65			
312	17.7	0.15	0.39			
312	17.7	0.37	0.61			
315	17.7	0.54	0.73			
317	17.8	0.52	0.72			
311.5	**311.5**	0.41	**0.394**	**1.800**		**86.0 (1)**

Initial DGM Reading (liters):		Impinger 1 Final:	
Final DGM Reading (liters):		Impinger 1 Initial:	
Initial DGM Reading (liters):		Impinger 2 Final:	
Final DGM Reading (liters):		Impinger 2 Initial:	
Initial DGM Reading (liters):		Impinger 3 Final:	
Final DGM Reading (liters):		Impinger 3 Initial:	
Initial DGM Reading (liters):		Impinger 4 Final:	37.7
Final DGM Reading (liters):	22.245	Impinger 4 Initial:	
Volume:	**22.245**	**Total wt of impingers:**	**37.7**

PRELIMINARY VELOCITY DATA

PLANT: IMPP

CITY: Delta, UT

SAMPLE LOCATION: STACK

TEST DATE: 11 October 1999

OPERATOR: MF, JJ

ENTERED BY: MF

CHECKED BY:

DATA ENTRY	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			P-1	2	3
ROUND STACK, DIAMETER	ds	inches	336.000		
RECTANGULAR STACK, LENGTH	L	inches			
WIDTH	W	inches			
NOZZLE DIAMETER	dn	inches			
AVERAGE STACK TEMPERATURE	Fs	degrees F	120.2	0.000	0.000
AVERAGE METER TEMPERATURE	Fm	degrees F	80.167	#DIV/0!	#DIV/0!
STANDARD TEMPERATURE(68 (EPA),60 (AQMD))	Tstd	degrees F	68.000		
BAROMETRIC PRESSURE	Pbar	in. Hg	29.500		
STACK STATIC PRESSURE	Pg	in. H20	-0.780		
AVG DELTA H	dH	in. H20	1.850	#DIV/0!	#DIV/0!
AVG VELOCITY HEAD	dP	in. H20	1.319	0.000	0.000
PITOT COEFFICIENT	Cp	-	0.840		
GAS SAMPLE VOLUME	Vm	cubic ft.	22.498	0.000	0.000
METER CALIBRATION FACTOR	Y	-	0.999		
TOTAL SAMPLING TIME	min	minutes	30.000		
STACK GAS OXYGEN CONTENT	Co2,m	%	6.000		
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	12.500		
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	65.800	0.000	0.000

PRELIMINARY VELOCITY DATA

PLANT: IMPP

CITY: Delta, UT

SAMPLE LOCATION: STACK

TEST DATE: 11 October 1999

OPERATOR: MF, JJ

ENTERED BY: MF

CHECKED BY:

CALCULATED DATA	SYMBOL	UNITS	DATA	DATA	DATA
RUN NUMBER			1	2	3
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000	0.000	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND)	As	sq. feet	615.752	0.000	0.000
= L * W/144 (RECTANGULAR)			0.000	0.000	0.000
STANDARD TEMPERATURE(528°(EPA),520°(AQMD))	Tstdr	degrees R	528.000	460.000	460.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	580.165	460.000	460.000
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	540.167	#DIV/0!	#DIV/0!
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64 (Tstdr/528) Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	cubic ft.	21.756	#DIV/0!	#DIV/0!
VOLUME OF WATER VAPOR, VwStd = 0.04707 (Tstdr/528)*Ww	VwStd	cubic ft.	3.097	0.000	0.000
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	none	0.125	#DIV/0!	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(C02,m)-(Cco2,m)}	Md	g/g-mole	30.240	28.000	28.000
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	28.715	#DIV/0!	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	29.443	0.000	0.000
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	68.314	#DIV/0!	#DIV/0!
vsm = 0.3048 * vs	vsm	m/s	20.822	#DIV/0!	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	2523876.8	#DIV/0!	#DIV/0!

Test Date
Run 1

	(°F)	(sqrt)	(in. H2O)	H2O) (sqrt)	dH (in H2O)	Temp values	Temp values
	118	10.9	1.4	1.18	1.85	80	75
	120	11.0	1.35	1.16	1.85	84	76
	120	11.0	1.2	1.10	1.85	88	78
	120	11.0	1.41	1.19	1.85		
	120	11.0	1.32	1.15	1.85		
13.7	120	11.0	1.18	1.09	1.85		
	120	11.0	1.38	1.17	1.85		
	121	11.0	1.3	1.14	1.85		
	121	11.0	1.21	1.10	1.85		
	120	11.0	1.55	1.24	1.85		
	121	11.0	1.35	1.16	1.85		
	121	11.0	1.2	1.10	1.85		
	120.2	**120.2**	1.32	**1.319**	**1.850**		**80.2 (1)**

Initial DGM Reading (liters):	323.61	Impinger 1 Final:	668.5
Final DGM Reading (liters):	346.108	Impinger 1 Initial:	618.8
Initial DGM Reading (liters):		Impinger 2 Final:	622.1
Final DGM Reading (liters):		Impinger 2 Initial:	615.7
Initial DGM Reading (liters):		Impinger 3 Final:	454.7
Final DGM Reading (liters):		Impinger 3 Initial:	452.3
Initial DGM Reading (liters):		Impinger 4 Final:	807.2
Final DGM Reading (liters):		Impinger 4 Initial:	799.9
Volume:	22.498	**Total wt of impingers:**	**65.8**

Calibration Data

GE-EER

METER BOX CALIBRATION DOCUMENTATION

Meter Box #: CA-4
Date: 10.4.99

Project#: EPA cal for IPS jo
Reference Calibration Meter Gamma: 1.0000
Barometric Pressure: 29.94

	OPERATING CONDITIONS		DRY GAS METER					REFERENCE CAL.METER				
			Volume Readings, ft^3			Temperatures		Volume Readings, ft^3			Temperatures	
	dH	Time	Initial	Final	Total	DGM_i	DGM_f	Initial	Final	Total	RGM_i	RGM_f
1.2	4.6	4.3	247.304	252.392	5.088	83	83	662.080	667.181	5.101	80	80
===												
1.2	4.6	4.3	252.392	257.430	5.038	83	84	667.181	672.250	5.069	80	80
===												
1	3.2	5.3	258.300	263.538	5.238	84	85	673.120	678.341	5.221	80	80
===												
1	3.2	5.3	263.538	268.745	5.207	85	85	678.341	683.548	5.207	80	80
===												
0.8	2	7.0	269.104	274.675	5.571	85	86	683.905	689.443	5.538	80	80
===												
0.8	2	6.5	274.675	279.853	5.178	86	86	689.443	694.586	5.143	80	80
===												
0.6	0.99	9.0	281.000	286.110	5.110	86	86	695.741	700.793	5.052	80	80
===												
0.6	0.99	8.8	286.110	291.077	4.967	86	86	700.793	705.721	4.928	80	80
===												
0.4	0.47	14.3	291.400	297.032	5.632	86	86	706.040	711.614	5.574	80	80
===												
0.4	0.47	12.8	297.032	302.076	5.044	86	84	711.614	716.608	4.994	80	79

	GAMMA	Diff. From Ave.		Delta H@	Diff. From Ave.	
dH		Value	within 0.02?		Value	within 0.2?
4.6	0.9969	0.002	Pass	1.8156	0.020	Pass
4.6	1.0014	0.002	Pass	1.8369	0.041	Pass
3.2	0.9972	0.002	Pass	1.8347	0.039	Pass
3.2	1.0014	0.002	Pass	1.8429	0.047	Pass
2	0.9995	0.000	Pass	1.8085	0.013	Pass
2	0.9994	0.000	Pass	1.8065	0.011	Pass
0.99	0.9972	0.002	Pass	1.7766	0.019	Pass
0.99	1.0007	0.002	Pass	1.7649	0.031	Pass
0.47	0.9995	0.000	Pass	1.7370	0.059	Pass
0.47	0.9990	0.000	Pass	1.7323	0.063	Pass
	AVG 0.9992				AVG. 1.7956	

Initiated By: B. A. Chapman

QC Review By: _____

GE-EER

POST TEST METER BOX CALIBRATION DOCUMENTATION

Meter Box # CA4

Date: 12/7/99

Project# 6792

Reference Calibration Meter Gamma 1.0000

Barometric Pressure: 29.56

OPERATING CONDITIONS		DRY GAS METER					REFERENCE CAL.METER				
		Volume Readings, ft^3			Temperatures		Volume Readings, ft^3			Temperatures	
dH	Time	Initial	Final	Total	DGM_i	DGM_f	Initial	Final	Total	RGM_i	RGM_f
1.8	13.5	976.832	986.840	10.008	68	68	826.170	836.215	10.045	72	72
1.8	13.5	986.840	996.845	10.005	69	69	836.215	846.390	10.175	75	75
1.8	13.5	996.845	1006.850	10.005	69	69	846.390	856.398	10.008	75	75

DH	GAMMA	Diff. From Ave		Delta H@	Diff. From Ave.	
		Value	within 0.02?		Value	within 0.2?
1.8	0.9917	0.001	Pass	1.8689	0.000	Pass
1.8	1.0011	0.009	Pass	1.8386	0.031	Pass
1.8	0.9847	0.008	Pass	1.9004	0.031	Pass

AVG. 0.9925 AVG. 1.8693

Performed By: Jeff Dean

QC Review By: _____

GE-EER

METER BOX CALIBRATION DOCUMENTATION

Meter Box # CA-2

Date 10 4 99

Project# EPA cal for IPS jo

Reference Calibration Meter Gamma 1.0000

Barometric Pressure: 29.94

	OPERATING CONDITIONS		DRY GAS METER					REFERENCE CAL.METER				
			Volume Readings, ft^3			Temperatures		Volume Readings, ft^3			Temperatures	
	dH	Time	Initial	Final	Total	DGM_i	DGM_f	Initial	Final	Total	RGM_i	RGM_f
1.2	4.5	4.3	148.006	153.010	5.004	73	72	503.809	508.887	5.078	72	72
###						73	72					
1.2	4.5	4.5	153.010	158.305	5.295	73	73	508.887	514.263	5.376	73	73
###												
1	3.4	4.8	224.008	229.014	5.006	83	83	580.406	585.415	5.009	76	77
###												
1	3.4	5.2	234.022	239.300	5.278	84	84	590.425	595.737	5.312	78	77
###												
0.8	2	6.5	242.302	247.422	5.120	84	84	598.740	603.861	5.121	78	78
###												
0.8	2	6.5	247.422	252.586	5.164	84	84	603.861	609.026	5.165	78	79
###												
0.6	0.95	9.3	253.400	258.523	5.123	84	84	609.825	614.941	5.116	78	79
###												
0.6	0.95	9.3	258.523	263.650	5.127	84	84	614.941	620.068	5.127	79	80
###												
0.4	0.46	12.8	265.002	270.020	5.018	84	85	621.418	626.426	5.008	80	80
###												
0.4	0.46	13.3	270.020	275.237	5.217	84	85	626.426	631.657	5.231	80	81

dH	GAMMA	Diff From Ave. Value	Diff From Ave. within 0.02?	Delta H@	Diff. From Ave. Value	Diff. From Ave. within 0.2?
4.5	1.0046	0.002	Pass	1.8158	0.048	Pass
4.5	1.0042	0.002	Pass	1.7872	0.019	Pass
3.2	1.0043	0.002	Pass	1.7743	0.006	Pass
3.2	1.0102	0.004	Pass	1.8320	0.064	Pass
1	1.0064	0.000	Pass	1.8096	0.042	Pass
2	1.0055	0.001	Pass	1.7877	0.020	Pass
0.95	1.0065	0.000	Pass	1.7528	0.015	Pass
0.95	1.0060	0.000	Pass	1.7517	0.016	Pass
0.46	1.0052	0.001	Pass	1.6906	0.077	Pass
0.46	1.0090	0.003	Pass	1.6766	0.091	Pass
	AVG 1.0062				AVG. 1.7678	

Performed By: [illegible]

QC Review By:

GE-EER

POST TEST METER BOX CALIBRATION DOCUMENTATION

Meter Box # CA2

Date: 12/7/99

Project# 6792

Reference Calibration Meter Gamma 1.0000

Barometric Pressure: 29.53

OPERATING CONDITIONS		DRY GAS METER					REFERENCE CAL.METER				
		Volume Readings, ft³			Temperatures		Volume Readings, ft³			Temperatures	
dH	Time	Initial	Final	Total	DGM,	DGM,	Initial	Final	Total	RGM,	RGM,
1.0	15.5	703.985	713.880	9.895	56	56	912.700	922.700	10.000	55	55
1.0	15.5	713.880	723.875	9.995	56	56	922.846	932.866	10.020	58	58
1.0	15.5	723.855	733.857	10.002	56	56	932.866	942.986	10.120	59	59
1.0	15.8	733.857	743.972	10.115	56	56	942.986	953.000	10.014	60	60

DH	GAMMA	Diff. From Ave. Value	Diff. From Ave. within 0.02?	Delta Ha	Diff. From Ave. Value	Diff. From Ave. within 0.2?
1.01	1.0100	0.013	Pass	1.3389	0.008	Pass
1	0.9962	0.001	Pass	1.3358	0.011	Pass
1.01	1.0034	0.006	Pass	1.3277	0.019	Pass
0.99	0.9800	0.017	Pass	1.3864	0.039	Pass

AVG. 0.9974

AVG. 1.3472

Performed By: Jeff Dean

QC Review By: _____

NOZZLE CALIBRATION

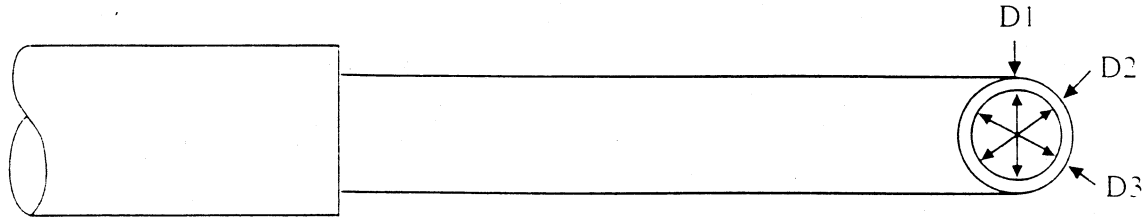
Sample Location: _____
Plant: _____
Inspector: JD / BZ
Date: 01 OCT 99
Time: 12:30

GLASS

Nozzle Identification Number	D1	D2	D3	ΔD	D(avg)
C3	.2550	.2555	.2545		
B 3	.2550	.2550	.2560		.2553
C 1	.2550	.2550	.2550		.2550
B 1	.2495	.2500	.2495	BROKEN	.2496
C 4	.2550	.2545	.2550		
"Chipped"	.2280	.2285	.2275		

Where:

D1,D2,D3 = nozzle diameter measured on a different diameter in inches.
Accuracy within 0.001 in.
Δ = maximum difference in any two measurements.
Tolerance = 0.004 in.
D(avg) = avg of D1,D2, D3



EER

NOZZLE CALIBRATION

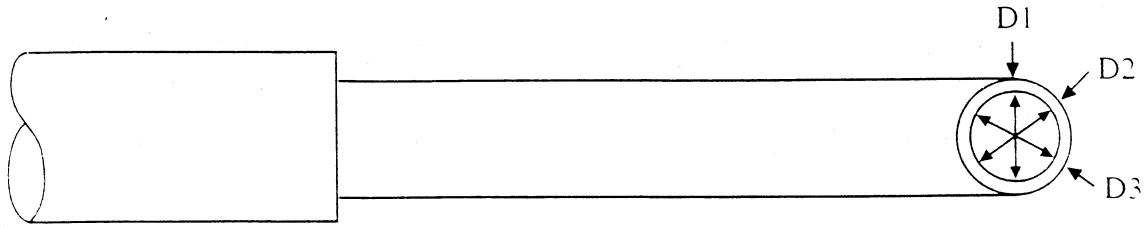
Sample Location: _____
Plant: _____
Inspector: Jeff Dea
Date: 9-24-91
Time: _____

Nozzle Inside Diameter (inches)					
Nozzle Identification Number	D1	D2	D3	ΔD	D(avg)
P3	.2965	.2975	.2970		
P4	.1940	.1940	.1935		
P5	.2275	.2265	.2280		
P6 x	.2045	.2040	.2040		.2042
P7 x	.2200	.2195	.2205		.2200
P8 x	.2240	.2250	.2240		.2243
G17	.3040	.3045	.3040		
P9	.2980	.2980	.2990		.2983
P10	.2985	.2995	.2995		

B2 F.B.

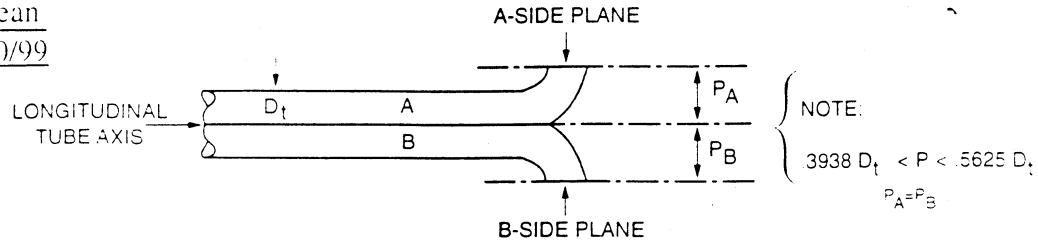
Where:

D1,D2,D3 = nozzle diameter measured on a different diameter in inches.
Accuracy within 0.001 in.
Δ = maximum difference in any two measurements.
Tolerance = 0.004 in.
D(avg) = avg of D1,D2, D3



EER

Pitot # 94
Length 6"
Inspector Jeff Dean
Inspection Date 9/30/99



(b)

D_T .375 In

P_A 0.429 In

P_B 0.429 In

α_1 0 ≤ 10°

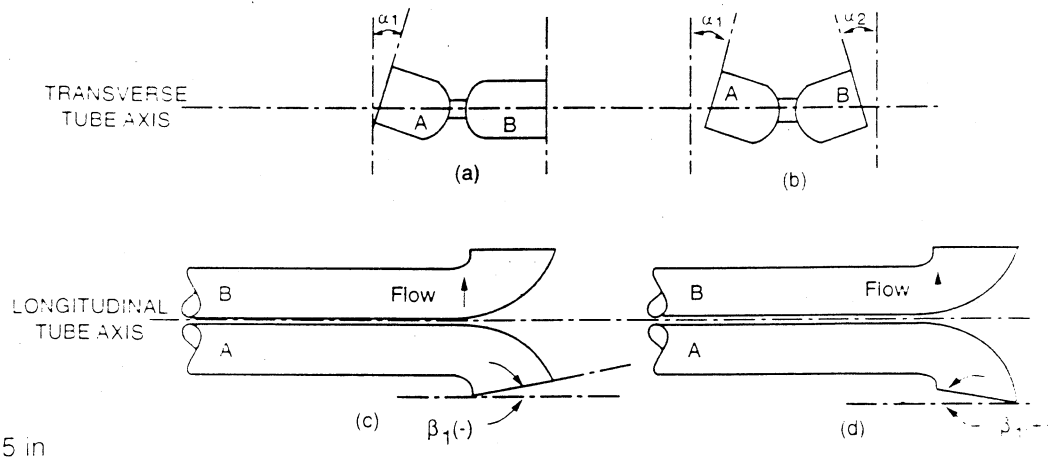
α_2 -2 ≤ 10

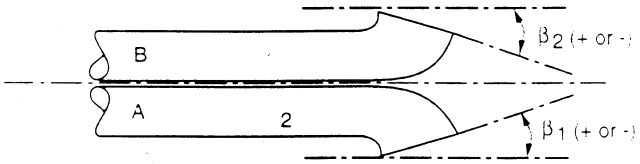
β_1 0 ≤ 5°

β_2 1 ≤ 5

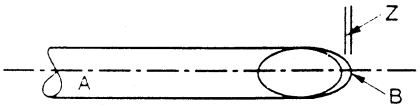
Z 0 ≤ 0.125 in

W 0 ≤ 0.031 in

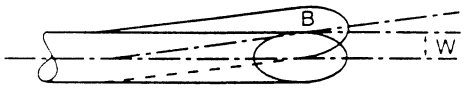




(e)



(f)



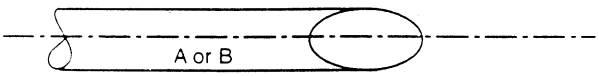
(g)

Opening A Description

Good

Opening B Description

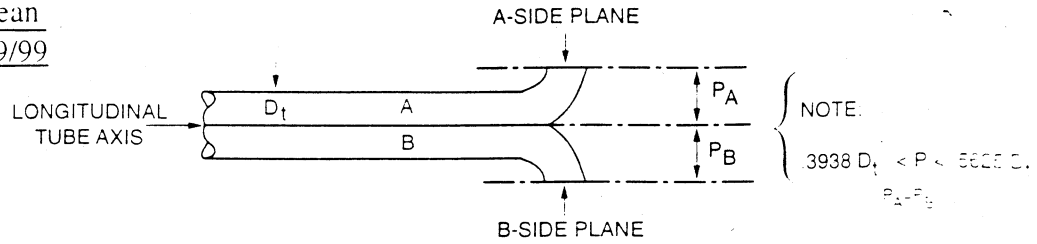
Good



(c)

(Describe condition, cleanliness, nicks, corrosion, etc.)

Pitot # 63
Length 16.5
Inspector Jeff Dean
Inspection Date 9/29/99



(b)

D_T 0.375 In

P_A 0.545 In

P_B 0.5453 In

α_1 -1 ≤ 10°

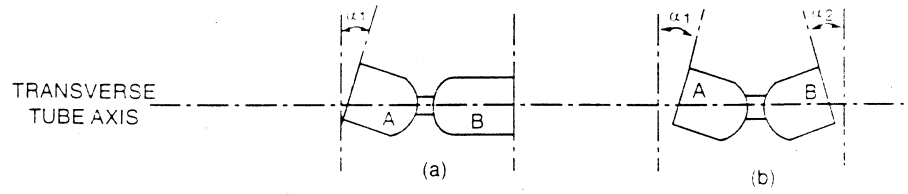
α_2 0 ≤ 10°

β_1 -1 ≤ 5°

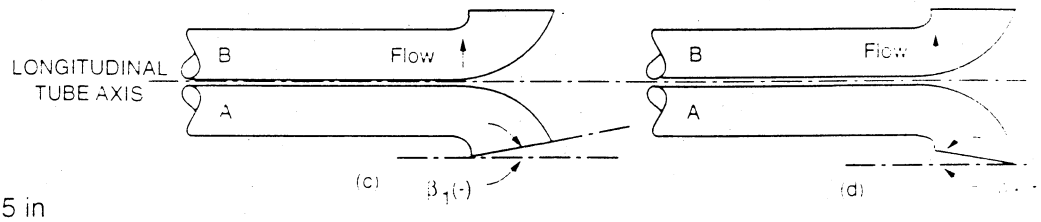
β_2 1 ≤ 5°

Z 0 ≤ 0.125 in

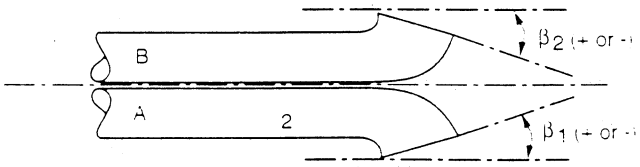
W 0 ≤ 0.031 in



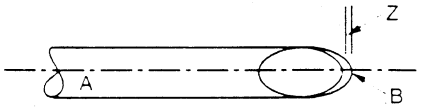
(a) (b)



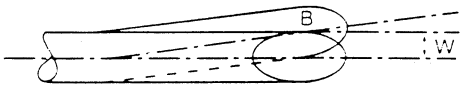
(c) (d)



(e)



(f)



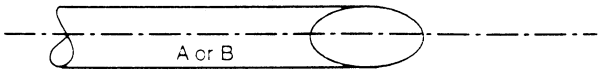
(g)

Opening A Description

Good

Opening B Description

Good



(c)

(Describe condition, cleanliness, nicks, corrosion, etc.)

ID No. Z004

Date: 9/30/99

Thermocouple Calibration Record

TC Description		Calibration Data	
Type:	K	Location:	Test Site
Length:	14 in.	Tested by:	D.Jones
Diameter:	1/8 in.		

Temperature	Temp. of Standard Measured (°C)	Temp. of Standard Measured (°F)	Ts (°R)	Temp. of TC Measured (°F)	Ttc (°R)	ΔT1 * (°R)	ΔT2 ** abs.%
Ice Slurry (0 C)	0	32	492	32	492	0	-0.2033%
	0	32	492	32	492	0	0.0000%
	0	32	492	32	492	0	0.0000%
Rolling Boil (100 C)	99	210	670	212	672	2	0.2985%
	99	210	670	212	672	2	0.2985%
	99	210	670	212	672	2	0.2985%
Hot Oil (~ 200 C)	232	450	910	453	913	3	0.3297%
	232	450	910	452	912	2	0.2198%
	232	450	910	451	911	1	0.1099%

* $\Delta T1 = Ttc - Ts$

** $\Delta T2 = \Delta T1 / (Ts)$, $\Delta T2 \leq 1.5\%$ of measured point (°R) or data correction required.

Standards and Equipment

Standard: ASTM Mercury-in-Glass Thermometer

TC Readout: Omega HH26K TC Readout T-158325

Other Equipment:

Comments (if any)

Z004 - 9/30/99

Appendix C

Sampling Log and Chain-of-Custody Records

61137

Energy & Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel. (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by: 15 to:

EER Contact: Mike Fukui
tel (949) 552-1903
fax (949) 857-1943

Address: GE-EER Corp.
3001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.:
GE-EER Corporation
18 Mason
Irvine, CA 92718

Sample Chain of Custody Record

page of

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. LADD

Test Operator(s): D. LADD

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method				ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
	207759	RB-OHM-7	Blank-0.1N HNO3	10-12-99	09:20	1	X	X				Vol=50 ml [120 ml jar]
	207756	RB-OHM-8 Recovery Trailer	Blank-1N KCl	10-12-99	09:20	1	X	X				Vol=50 ml [120 ml jar]
	207758	RB-OHM-9 Recovery Trailer	Blank-5% HNO3/10% H2O2	10-12-99	09:20	1	X	X				Vol=50 ml [120 ml jar]
	207755	20 Reagent-10A Blank-Recovery Trailer	Blank-H2SO4 - KMnO4	10-12-99	0915	1	X	X				Vol=50 ml, vented cap [120 ml jar]
	207757	RB-OHM-11 Recovery Trailer	Blank-10% Hydroxylt Chloride Sulfate	10-12-99	09:23	1	X	X				Vol=100 ml [120 ml jar]
	207767	RB-OHM-10B 64701	Blank Batch B - H2SO4 ~~Blank-Sample Filter~~ KMnO4	10-12-99	14:01	1	X	X				Three Unused Filters
	207770	RB-OHM-10 64702	Blank Batch #1 KMnO4/H2SO4 HMN4	10-13-99	09:33	1	✓	✓				
	207783	RB-OHM-10 64703	Blank Batch #2 KMnO4/H2SO4	10-13-99	13:41	1	✓	✓				
	207797	RB-OHM-7 64704	Blank New Blend .1N HNO3 Hfunc	10-13-99	17:50	1	✓	✓				
	207798	RB-OHM-7 64705	Blank Batch 10-14-99 KMnO4/H2SO4	10-14-99	09:30	1	✓	✓		✓		16

Method of Shipment:	Remarks (RUSH!, units: mg/L, ppm, etc.):	Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time
Shipment I.D.: / Date Shipped:		D. LADD	11:05 10-25-99	R. Carrero	4910 88 12:15
Samples Shipped to: Phylip Analytical Services, 299 Cuyuga Rd., Cheektowaga, NY 14225					completed Shipment
	After analysis: [ ] Archive samples (Hold for months, then dispose.)				
Attention: Ron McLeod	[ ] Return samples to: EER Corporation 8001 Irvine Blvd., Irvine, CA 92618				

TOP - ORIGINAL MUST STAY WITH SAMPLES MIDDLE - LABORATORY COPY BOTTOM - EER COPY RETAIN WITH FIELD LOG

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by ____ **to:** ____ **Bill to:** P.O. No.:

EER Contact:: [illegible] Address: [illegible] **EER Corporation**

tel: (949) 552 1503 [illegible] CA 92618 **18 Mason**

fax: ( ) **Irvine, CA 92718**

Sample Chain of Custody Record

page ____ of ____

EER Project No: [illegible]

Project Name: [illegible]

Site Name: [illegible]

Sampling System Prepared by: [illegible]

Test Operator(s): [illegible]

Samples Recovered by: [illegible]

Analyses Required: [illegible]

Laboratory I.D. No.	EER Label No.	FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION: Test ID / Location	Physical Description	Date	Time	No. of Containers	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
[illegible]	216058	Filter Blank	Filter (wrapped)	10-14-98	[illegible]	[illegible]	[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to: [illegible]

Attention: [illegible]

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: Archive samples (Hold for months, then dispose.)

Return samples to: EER Corporation 8001 Irvine Blvd., Irvine, CA 92618

Relinquished by: (Sign & Print) [illegible]

Date / Time: [illegible]

Received by: (Sign & Print) [illegible]

Date / Time 4/10/98 12:15 [illegible]

TOP - ORIGINAL MUST STAY WITH SAMPLES MIDDLE - LABORATORY COPY BOTTOM - EER COPY RETAIN WITH FIELD LOG

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by

EER Contact: Mike Fukuda
tel: (949) 352-1903
fax: (949) 357-1943

to:

Address: GE-EER Corp.
2001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137

GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page of

EER Project No: 3719-010

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. LADD

Test Operator(s): B. ZIMPERMAN / J. DEAN

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, T.T., Holding Times, Sample Preparation, Add'l Instructions, etc.)
	207750	FB-SI-OHM-1	1. Sample Filter ✓	10-12-99	11:00	1	X	X					~~Petri dish or~~ [500 ml jar] AG
	207751	FB-SI-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓			1	X	X					Vol= ml [500 ml jar] AG
	207752	FB-SI-OHM-3	3. B.H. KCl Catch (Imp. 1, 2, 3) (A) ✓			1	X	X					Vol= ml [1,000 ml jar] KG
	207753	FB-SI-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~)			1	X	X					Vol= ml [500 ml jar] AG
	207754	FB-SI-OHM-5A	5. B.H. KMnO4 Catch (Imp 5, 6, 7) (A) ✓			1	X	X					Vol= m, vented [~~500 ml~~ jar] SZLG
	207760	FB-SI-OHM-5B	B.H. KMnO4 Catch + RINSE ✓			1	✓	✓					SZLG
	~~207783~~	FB-S											

SZLAG x 3
SZLG x 2
1 LG

Method of Shipment:

Shipment I.D.:

Date Shipped:

Samples Shipped to:
Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: ☐ Archive samples (Hold for ____ months, then dispose.)

☐ Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible]	991078 1715

TOP - ORIGINAL MUST STAY WITH SAMPLES - MIDDLE - LABORATORY COPY - BOTTOM - EER COPY BETAIN WITH EER RECORDS

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by _____ _____ to:

EER Contact: Mike Fukuda
tel: (949) 552-1203
fax: (949) 857-1943

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page _____ of _____

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. LADD

Test Operator(s): B. ZIMPERMAN / J. DEAN

Samples Recovered by: D. LADD / J. JACKSON

Analyses Required: Determine Volume; Hg Analysis per Ontario Hydro Method; Tom McGuire

Laboratory I.D. No.	EER Label No	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.
641,72	207735	R1-S1-OHM-1	1. Sample Filter	10-12-99	15:30 20:30	1	X	X					~~Petri dish or~~ [500 ml jar] AG
	207736	R1-S1-OHM-2	2. F.H. 0.1N HNO3 Rinse			1	X	X					Vol= ml [500 ml jar] AG
	207737	R1-S1-OHM-3	3. B.H. KCl Catch (Imp. 1, 2, 3) (A)			1	X	X			522 AG x 3		Vol= ml [1,000 ml jar] CG
	207738	R1-S1-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3)~~			1	X	X			522 CG x 2 ILCG		Vol= ml [500 ml jar] AG
	207739	R1-S1-OHM-5A	5. B.H. KMnO4 Catch (Imp 5, 6, 7) (A)			1	X	X					Vol= m, vented [500 ml jar] CG
	207769	R1-S1-OHM-5B	KMnO4 CATCH + RINSE IMP 5-6-7			1	✓	✓					522 CG

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to: Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/l, ppm, etc.):

After analysis: [ ] Archive samples (Hold for months, then dispose.)
[ ] Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible]	99/10/28 12:15

00098

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax: (949) 357-1943

to:

Address: GE-EER Corp.
3001 Irvine Blvd.
Irvine, CA 92612

Bill to: P.O. No.: 61137
Ge-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page of

EER Project No.: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: DAVID LADD

Test Operator(s): B. Zimmerman / J. Dean

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.
6413	207784	R2-SI-OHM-1	1. Sample Filter ✓	10-13-99	1147 1520	1	X	X					~~Petri dish~~ [500 ml jar]
"	207772	R2-SI-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓			1	X	X		500 Au x 3			Vol= ml [500 ml jar] Au
✓	207773	R2-SI-OHM-3	3. B.H. KCl Catch (Imp 1, 2, 3) (A) ✓			1	X	X		500 CC x 2			Vol= ml [1,000 ml jar] CC
✓	207774	R2-SI-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~) ✓			1	X	X		1 CC			Vol= ml [500 ml jar] Au
✓	207775	R2-SI-OHM-5A	5. B.H. KMnO4 Catch (Imp. 5, 6, 7) (A) 1 of 2 ✓			1	X	X					Vol= m, vented [500 ml jar] CC
✓	207776	R2-SI-OHM-5B	KMnO4 CATCH + B.H. RINSE (IMP 5-6-7 ✓			1	✓	✓					500 CC

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to:
Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: [ ] Archive samples (Hold for months, then dispose.)

[ ] Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[signature]	1105 10-15-99	[signature] K. Carlile	10/19/99 1215
			Completed Input

TOP: ORIGINAL MUST STAY WITH SAMPLES MIDDLE: LABORATORY COPY BOTTOM: EER COPY

00199

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax. (714) 859-3194

Laboratory Report Due by _____ to:

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax. (949) 857-1943

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page _____ of _____

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Services

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. LADD

Test Operator(s): B. ZIMMERMAN / J. DEAN

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
64674	207785	R3-SI-OHM-1	1. Sample Filter ✓	10-13-99	21:33 17:15	1	X	X					~~Petri dish or~~ [500 ml jar] AG
	207786	R3-SI-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓		17:15 21:57	1	X	X		52 AG x 3			Vol= ml [500 ml jar] AG
	207787	R3-SI-OHM-3	3. B.H. KCl Catch (Imp. 1, 2, 3) (A) ✓			1	X	X		52 AG x 2			Vol = ml [1,000 ml jar] AG
	207788	R3-SI-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp. 4 & ~~final rinse 1, 2, 3~~)			1	X	X		1 AG			Vol= ml [500 ml jar] AG
	207789	R3-SI-OHM-5A	5. B.H. KMnO4 Catch (Imp. 5, 6, 7) (A) ✓			1	X	X					Vol= m, vented [500 ml jar] AG
	207790	R3-SI-OHM-5B	IMP 5 & 7 CATCH + RINSE ✓			1	✓	✓					500 AG

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to:
Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: [ ] Archive samples (Hold for months, then dispose)
[ ] Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible]	9/10/8 12:15
			Completed [illegible]

TOP - ORIGINAL MUST STAY WITH SAMPLES MIDDLE - LABORATORY COPY BOTTOM - EER COPY RETAIN WITH FILE COPY

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel. (714) 859-8851
fax. (714) 859-3194

Laboratory Report Due by

EER Contact: Mike Fukuda
tel. (949) 552-1903
fax. (949) 957-1913

to:

Address: CE-EER
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137

CE-EER Corporation
18 Mason
Irvine, CA 92718

Sample Chain of Custody Record

page of

EER Project No: 3749-010

Project Name: Mercury Testing at Intermountain Power Services

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. Lanno

Test Operator(s): B. Singleman / J. Dean

Samples Recovered by: D. Lanno

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
	207801	R4-SI-OHM-1	1. Sample Filter ✓	10-14-99	10:05	1	X	X					Petri dish or [500 ml jar] AG
	207802	R4-SI-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓		13:30	1	X	X					Vol= ml [500 ml jar] AG
	207803	R4-SI-OHM-3	3. B.H. KCl Catch (Imp 1, 2, 3) (A) ✓			1	X	X		SBAG x3			Vol= ml [1,000 ml jar] CG
✓	207804	R4-SI-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 ~~& Final Rinse 1, 2, 3)~~			1	X	X		SDCG x2			Vol= ml [500 ml jar] AG
✓	207805	R4-SI-OHM-5A	5. B.H. KMnO4 Catch (Imp 5, 6, 7) (A) ✓			1	X	X		ICCG x1			Vol= m, vented [500 ml jar] CG
✓	207806	R4-SI-OHM-5B	IMP 5-6-7 CATCH + 2N SO4 ✓			1	✓	✓					~~SDCG~~ SDCG

Method of Shipment:	Remarks (RUSH!, units: mg/L, ppm, etc.):	Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time
Shipment I.D.: / Date Shipped:		[signature]	[illegible] 10-15-99	[signature] K. Larson	991025 12:15
Samples Shipped to: Phylip Analytical Services, 299 Cayuga Rd., Checktowaga, NY 14225					completed shipment
Attention: Ron McLeod	After analysis: Archive samples (Hold for months, then dispose.)				
	Return samples to: EER Corporation, 8001 Irvine Blvd., Irvine, CA 92618				

TOP - ORIGINAL MUST STAY WITH SAMPLES MIDDLE - LABORATORY COPY BOTTOM - EER COPY RETAIN WITH FIELD LOG

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by _____ to:

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax: (949) 857-1943

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page ____ of ____

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: (OUTLET F.B.) D. LADD

Test Operator(s): J. JACKSON / M. FUKUDA

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION: Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.
	207740	FB-50-OHM	1. Sample Filter ✓	10-12-99	69:00	1	X	X					Petri dish ~~or 500 ml jar~~
	207741		2. F.H. 0.1N HNO3 Rinse ✓			1	X	X					Vol= ml [500 ml jar] AG
	207742		3. B.H. KCl Catch (Imp. 1, 2, 3) (A) ✓			1	X	X					Vol= ml [1,000 ml jar] CG
	207743		4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~)			1	X	X					Vol= ml [500 ml jar] AG
	207744		5. B.H. KMnO4 Catch (Imp. 5, 6, 7) (A) ✓			1	X	X					Vol= m, vented [500 ml jar] CG
	207766		B.H. KMnO4 CATCH + RINSE ✓			1	✓	✓					
	~~207770~~	~~FB 005~~											

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to:
Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: [ ] Archive samples (Hold for months, then dispose.)
[ ] Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible]	99/10/28 13:15
[illegible]	[illegible]	[illegible]	completed shipment

TOP: ORIGINAL MUST STAY WITH SAMPLES MIDDLE: LABORATORY COPY BOTTOM: EER COPY

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel. (714) 859-8851
fax (714) 859-3194

Laboratory Report Due by to:

EER Contact: Mike Fukuda
tel. (949) 552-1903
fax (949) 857-1943

Address: GE-EER Corp.
9001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page of

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #2SGA

Sampling System Prepared by: D. LADD

Test Operator(s): L. JACKSON / M. FUKUDA

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.
04/11.	207745	R1-SO-OHM-1	1. Sample Filter ✓	10-12-99	15:30 20:30	1	X	X					Petri dish or [500 ml] jar
	207746	R1-SO-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓			1	X	X					Vol= ml [500 ml jar] AG
	207747	R1-SO-OHM-3	3. B.H. KCl Catch (Imp 1, 2, 3) (A) ✓			1	✓	✓					Vol= ml [1,000 ml jar] G
	207748	R1-SO-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~) ✓			1	X	X					Vol= ml [500 ml jar] AG
	207768	R1-SO-OHM-5A	5. B.H. KMnO4 Catch (Imp. 5, 6, 7) (A) ✓			1	X	X					Vol= m, vented [500 ml jar] G
	207749	R1-SO-OHM-5B	KMnO4 CATCH - RINSE ✓			1	✓	✓					500 G

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to: Phylip Analytical Services
299 Cayuga Rd.
Checktowaga, NY 14225

Attention: Ron McLeod

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: ☐ Archive samples (Hold for ___ months, then dispose.)
☐ Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible]	991025 1:15

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by _____ _____ to:

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax: (949) 857-1943

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page _____ of _____

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: DAVID LADD

Test Operator(s): J. JACKSON / M. FUKUDA

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION: Test ID / Location	Physical Description	Date	Time	No. of Containers	Analyses Required: Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
	207777	R2-SO-OHM-1	1. Sample Filter	10-13-99	11:47 15:20	1	X	X					Petri dish or 500 ml jar
	207778	R2-SO-OHM-2	2. F.H. 0.1N HNO3 Rinse			1	X	X					Vol= ml 500 ml jar
	207779	R2-SO-OHM-3	3. B.H. KCl Catch (Imp 1, 2, 3) (A)			1	X	X					Vol= ml 1,000 ml jar
	207780	R2-SO-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~)			1	X	X					Vol= ml 500 ml jar
	207781	R2-SO-OHM-5A	5. B.H. KMnO4 Catch (Imp 5, 6, 7) (A) 1 of 2			1	X	X					Vol= ml, vented 500 ml jar
	207782	R2-SO-OHM-5B	B.H KMnO4 Catch + Rinse			1	✓	✓					

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to:
Phylip Analytical Services
299 Cuyuga Rd.
Checktowaga, NY 14225

Ron McLeod

Remarks (RUSH!, units, mg/L, ppm, etc.):

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
			10/13/99 12:15

completed signed

TOP: ORIGINAL MUST STAY WITH SAMPLES MIDDLE: LABORATORY COPY BOTTOM: EER COPY RETAINED WITH FIELD LOG

C-04

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel. (714) 859 8851
fax: (714) 859 3194

Laboratory Report Due by

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax: (949) 857-1943

to:

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page of

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: D. CADD

Test Operator(s): J. JACKSON / M. FUKUDA

Samples Recovered by: D. CADD

Laboratory I.D. No.	EER Label No.	Test ID / Location	Physical Description	Date	Time	No. of Containers	Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, I.T., Holding Times, Sample Preparation, Add'l Instructions, etc.)
		FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION					Analyses Required						
1146	207791	23-SO-OHM-1	1. Sample Filter ✓	10-13-99	17:19-21:57	1	X	X					Petri dish 90 [500 ml jar]
	207792	23-SO-OHM-2	2. F.H. 0.1N HNO3 Rinse ✓			1	X	X					Vol= ml [500 ml jar] AG
✓	207793	23-SO-OHM-3	3. B.H. KCl Catch (Imp. 1, 2, 3) (A) ✓			1	X	X					Vol= ml [1,000 ml jar] CG
✓	207794	23-SO-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~)			1	X	X					Vol= ml [500 ml jar] AG
✓	207795	23-SO-OHM-5A	5. B.H. KMnO4 Catch (Imp. 5, 6, 7) (A) ✓			1	X	X					Vol= m, vented [500 ml jar] CG
✓	207796	23-SO-OHM-5B	Imp 5-6-7 Catch + Rinse ✓			1	✓	✓					500 CG

ppb
5 AG + 2
5 CG + 2
1 LCG

Method of Shipment:	Remarks (RUSH!, units: mg/l, ppm, etc.):	Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
Shipment I.D.: / Date Shipped:					
Samples Shipped to: Phylip Analytical Services, 299 Cuyuga Rd., Checktowaga, NY 14225					completed shipment
Attention: Ron McLeod	After analysis: [ ] Archive samples (Hold for months, then dispose.) [ ] Return samples to:				

TOP: ORIGINAL MUST STAY WITH SAMPLES MIDDLE: LABORATORY COPY BOTTOM: COPY

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859-8851
fax: (714) 859-3194

Laboratory Report Due by _____ _____ to:

EER Contact: Mike Fukuda
tel: (949) 552-1803
fax: (949) 857-1943

Address: GE-EER
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 61137
GE-EER
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page _____ of _____

EER Project No: 3749-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by: DAVE LADD

Test Operator(s): N. JACKSON / M. FUKUDA

Samples Recovered by: D. LADD

Laboratory I.D. No.	EER Label No.	FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION: Test ID / Location	Physical Description	Date	Time	No. of Containers	Analyses Required: Determine Volume	Hg Analysis per Ontario Hydro Method					ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.
41650	207807	24-50-OHM-1	1. Sample Filter	10-14-99	10:05 13:30	1	X	X					Petri dish ~~on [500 ml jar]~~
	207808	24-50-OHM-2	2. F.H. 0.1N HNO3 Rinse			1	X	X					Vol= ml [500 ml jar] AC
	207809	24-50-OHM-3	3. B.H. KCl Catch (Imp. 1, 2, 3) (A)			1	X	X					Vol= ml [1,000 ml jar] CC
	207810	24-50-OHM-4	4. B.H. HNO3/H2O2 Catch (Imp 4 & ~~Final Rinse 1, 2, 3~~)			1	X	X					Vol= ml [500 ml jar] AC
	207811	24-50-OHMSA	5. ~~B.H.~~ KMnO4 Catch (Imp. 5, 6, 7) (A)			1	X	X					Vol= m, vented [500 ml jar] CC
	207812	24-50-OHM-SB	IMP 5&7 (ORIGINAL)			1	✓	✓					5 & 7 CC

Method of Shipment:	Remarks (RUSH!, units: mg/L, ppm, etc.):	Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
Shipment I.D.: / Date Shipped:			1005		99/10/28
Samples Shipped to: Phylip Analytical Services, 299 Cuyuga Rd., Checktowaga, NY 14225					12:15
Attention: Ron McLeod	After analysis: ☐ Archive samples (Hold for months, then dispose.) ☐ Return samples to:				

TOP ORIGINAL MUST STAY WITH SAMPLES — MIDDLE COPY — EER COPY — BOTTOM COPY

Energy and Environmental Research Corporation

18 Mason, Irvine, CA 92718
tel: (714) 859 8851
fax: (714) 859 3194

Laboratory Report Due by

EER Contact: Mike Fukuda
tel: (949) 552-1893
fax: (949) 857-1943

to:

Address: GE-EER Corp.
8001 Irvine Blvd.
Irvine, CA 92618

Bill to: P.O. No.: 31204

GE-EER Corp.
18 Mason
Irvine, CA 92618

Sample Chain of Custody Record

page of

EER Project No: 3719-040

Project Name: Mercury Testing at Intermountain Power Service

Site Name: Intermountain Power Service Unit #25GA

Sampling System Prepared by

Test Operator(s)

Samples Recovered by

Laboratory I.D. No.	EER Label No.	FIELD SAMPLE IDENTIFICATION AND SAMPLING INFORMATION: Test ID / Location	Physical Description	Date	Time	No. of Containers	Analyses Required: HV in Coal by ASTM D2234/ASTM D3634	CT in Coal by ASTM D2234/ASTM D2361	Moisture in Coal by ASTM D2234/ASTM D3173	Sulfur in Coal by ASTM D2234/ASTM D4239	Ash in Coal by ASTM D2234/ASTM D3174	Coal HHV by ASTM D2234/ASTM D1989	ADDITIONAL INFORMATION (e.g. Volumes, TT, Holding Times, Sample Preparation, Add'l Instructions, etc.)
[illegible]	[illegible]	[illegible]	Coal Sample	[illegible]	[illegible]	[illegible]	X	X	X	X	X	X	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	↓	↓	↓	↓	↓	↓	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	↓	↓	↓	↓	↓	↓	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	↓	↓	↓	↓	↓	↓	

Method of Shipment:

Shipment I.D.: Date Shipped:

Samples Shipped to:
Hazen Research, Inc.
4601 Indiana Street
Golden, CO 80403

Attention: Jerry Cunningham

Remarks (RUSH!, units: mg/L, ppm, etc.):

After analysis: ☐ Archive samples (Hold for months, then dispose.)

☐ Return samples to:

Relinquished by: (Sign & Print)	Date / Time:	Received by: (Sign & Print)	Date / Time:
[illegible]	[illegible]	[illegible] DAVID LADD	10-14-99 16:30
[illegible] DAVID LADD	10/28/99 [illegible]	[illegible] G.H. Cunningham	10/29/99 1433

TOP - ORIGINAL MUST STAY WITH SAMPLES MIDDLE - LABORATORY COPY BOTTOM - EER COPY RETAINED AFTER SHIPMENT

Appendix D

Analytical Data Sheets

Hazen Research, Inc.
4601 Indiana St. • Golden, CO 80403
Tel (303) 279-4501
Fax (303) 278-1528

Date November 9 1999
HRI Project 009-27
HRI Series No. J404/99
Date Rec'd. 10/28/99
Cust. P.O.#

Energy & Environmental Research Corp.
Dave Ladd
18 Mason
Irvine CA 92718

REPORT OF ANALYSIS

Reporting Basis >		As Received				Dry				Air Dry
#	Interval	Moist. %	Ash %	Btu/Lb (HHV)	Sulfur %	Ash %	Btu/Lb (HHV)	Sulfur %	MMF Btu/Lb	Loss %
1	206172	7.88	8.15	12066	0.54	8.85	13098	0.58	14502	3.95
2	206174	7.52	8.47	12009	0.63	9.16	12986	0.68	14434	4.16
3	206173	7.77	8.63	12011	0.62	9.36	13022	0.67	14509	4.49
4	206176	7.31	8.68	12002	0.58	9.36	12949	0.63	14426	3.25

Report Prepared By:

Gerard H. Cunningham
Fuels Laboratory Supervisor

Hazen Research, Inc.
4601 Indiana St. • Golden, CO 80403
Tel: (303) 279-4501
Fax: (303) 278-1528

DATE Nov. 9, 1999
PROJ. # 009-27
CTRL # J404/99
REC'D 10/28/99

Energy & Environmental Research Corp.
Dave Ladd
18 Mason
Irvine, CA 92718

Sample Number:	-1	-2	-3	-4
Sample Identification:	206172	206174	206173	206176
Chlorine (A/R), %	<0.01	0.03	0.02	<0.01
Chlorine (Dry), %	0.01	0.03	0.02	0.01
Mercury (A/R), mg/kg	0.02	0.02	0.02	0.03
Mercury (Dry), mg/kg	0.02	0.02	0.02	0.03

By:

Gerard H. Cunningham
Fuel Laboratory Manager

A/R = As Received

Hazen Research, Inc.
4601 Indiana St. • Golden, CO 80403
Tel: (303) 279-4501
Fax: (303) 278-1528

December 16, 1999

GE Energy & Environmental Research Corporation
Desiree Jones
8001 Irvine Boulevard
Irvine, California 92618-1204

Desiree

Enclosed you will find a QA/QC package for your recent submittals of coal samples. This package includes the backup data for all parameters. The SRM 1630a standard was run with the mercury analysis. The reference value for this standard is 0.108 mg/kg of mercury, plus or minus 0.023 mg/kg.

There is no calibration data for the moisture and ash analyses. The calibration data for the sulfur and HHV analyses have been updated several times since your sample set was run, and would no longer apply to your samples. I was unaware that a data package would be required for this submittal, or I would have collected the calibration data when the samples were analyzed.

Replicate analyses may be reviewed in the data package.

A cross-reference of our control numbers and your sample identifications follows:

Hazen Control Number	GEEER Identification
J404/99-1	206172
J404/99-2	206174
J404/99-3	206173
J404/99-4	206175

The methods used are as follows:

Preparation by ASTM D 2013-86, Standard Method of Preparing Coal Samples for Analysis

Moisture by ASTM D 3173, Standard Test Method for Moisture in the Analysis Sample of Coal and Coke

Ash by ASTM D 3174-89, Standard Test Method for Ash in the Analysis Sample of Coal and Coke

Sulfur by ASTM D 4239-85, Standard Test Method for Sulfur in the Analysis Sample of Coal and Coke Using High Temperature Tube Furnace Combustion Methods

Calorific Value (BTU) by ASTM D 1989-91, Standard Test Method for Gross Calorific Value of Coal and Coke by Microprocessor Controlled Isoperibol Calorimeters

Chlorine by ASTM D 2361, Standard Test Method for Total Chlorine in Coal

Please contact me if I may be of further service to you.

Sincerely,

Gerard H. Cunningham
Fuel Laboratory Manager

AIR DRY LOSS MOISTURE CALCULATIONS
ANALYST: 10-29-1999

SAMPLE ID	TARE	GROSS WET	GROSS DRY	ADL,%
J404/99-1	206.80	1185.20	1146.60	3.95
-2	210.20	1355.90	1308.20	4.16
-3	199.90	1235.90	1189.40	4.49
-4	206.50	1495.60	1453.70	3.25

LABORATORY MOISTURE CALCULATIONS
ANALYST: TOM 10-29-1999

SAMPLE ID	TARE	SAMP.WT.	GROSS DRY	MOIST.,%
J404-1	14.7419	1.0019	15.7027	4.10
-1	13.3654	1.0026	14.3272	4.07
-2	13.6788	1.0019	14.6454	3.52
-2	12.9657	1.0025	13.9331	3.50
-3	14.0726	1.0033	15.0417	3.41
-3	13.7787	1.0016	14.7458	3.44
-4	12.6243	1.0018	13.5840	4.20
-4	14.6842	1.0019	15.6440	4.20
~~J404-1~~	~~14.0872~~	~~1.0049~~	~~15.7419~~	~~6.64~~
~~-1~~	~~13.4856~~	~~1.0087~~	~~14.4199~~	~~6.64~~

ASH IN COAL CALCULATIONS
ANALYST: VJH ASHING TEMPERATURE= 750 10-29-1999

SAMPLE ID	TARE	GROSS	NET	ASH,%
J404-1	17.8817	18.8857	17.9669	8.486
-1R	14.3731	15.3736	14.4580	8.486
-3	16.2466	17.2427	16.3353	8.905
-3R	17.1097	18.1055	17.1971	8.777
-2	14.6408	15.6474	14.7309	8.951
-2R	14.6246	15.6234	14.7158	9.131
-4	17.2006	18.2029	17.2909	9.009
-4R	16.0240	17.0269	16.1136	8.934
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501 • Telex 45-860

HAZEN

ANALYST _____

ANALYSIS DATE

```
ID CODE A0000000087 WT0.1510 CAL#1   10:32 10/29/99
        SULFUR SO3 1    1.39%
ID CODE A0000000088 WT0.1230 CAL#2   10:42 10/29/99
        SULFUR SO3 1    1.15%
ID CODE A0000000089 WT0.1260 CAL#2   10:46 10/29/99
        SULFUR          0.582%
ID CODE A0000000090 WT0.1450 CAL#2   10:49 10/29/99
        SULFUR          0.536%
ID CODE A0000000091 WT0.1870 CAL#1   10:53 10/29/99
        SULFUR          0.724%
ID CODE A0000000092 WT0.1730 CAL#1   12:12 10/29/99
        SULFUR          0.633%
ID CODE A0000000093 WT0.1560 CAL#1   12:15 10/29/99
        SULFUR          0.683%
ID CODE A0000000094 WT0.1880 CAL#1   12:18 10/29/99
        SULFUR          0.680%
ID CODE A0000000095 WT0.1860 CAL#1   12:22 10/29/99
        SULFUR          0.557%
ID CODE A0000000096 WT0.2030 CAL#1   12:26 10/29/99
        SULFUR          0.561%
ID CODE A0000000097 WT0.1490 CAL#1   12:30 10/29/99
        SULFUR          0.672%
ID CODE A0000000098 WT0.1370 CAL#1   12:33 10/29/99
        SULFUR          0.653%
ID CODE A0000000099 WT0.1520 CAL#1   12:37 10/29/99
        SULFUR          0.542%
        *** CHANGE FILTERS ***
```

J404 1 67 A 1 .503 R
1 .5
2 .580 R
2 .524
3 .784
3 .632
J404 - 4 .603
4 .600

J430 1 A 1 .477
1 .525

J404 - 1 1 .557
2 .561
2 .670
.653
.542

0.52 STD

HAZEN

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501 • Telex 45-860
FAX: (303) 278-1528

ANALYST _____

ANALYSIS DATE _____

ASTM METHOD: D4239-85
METHOD C

SULFUR ANALYSIS FORM – LECO SC-132

CONTROL #	SPECIAL INSTRUCT.	ID CODE	CALIBRATION	RESULT, %S
J404-3R	0	A	1	.640
3R	1			.659

ID CODE A000000000 13:24 10/29/99 WT0.1170 CAL#1
SULFUR 0.640%
ID CODE A000000001 13:28 10/29/99 WT0.1660 CAL#1
SULFUR 0.651%

HAZEN

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FAX: (303) 278-1528

Analyst Tam

Date 10/20/99

ANALYSIS REPORT

Control Number	Bomb Number	Sample Ident.	Sample Weight	Spike Weight	Fuse mm	Acid ml	BTU/lb
J404-1	1	59	1.0005		19	13	12596
1	2	60	1.0004		19	14	12555
2	1	61	1.0025		19	14	12548
2	2	62	1.0032		19	14	12544
3	1	63	1.0005		20	14	12579
3	2	64	1.0006		18	14	12603
4	1	65	1.0024		21	13	12408
4	2	66	1.0012		18	13	12429

CALORIMETRY FINAL REPORT

10/29/99	12:41:55	DETERMINATION	
SAMPLE ID	59	CAL ID	1
WEIGHT	1.0005	FUSE	19
ACID	13	SULFUR	0.00
INIT. TEMP.	23.6105	TEMP. RISE	2.88661
SPIKE WGHT.		EE VALUE	2436.61
GROSS HEAT	12596.4	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	12:49:16	DETERMINATION	
SAMPLE ID	60	CAL ID	2
WEIGHT	1.0084	FUSE	19
ACID	14	SULFUR	0.00
INIT. TEMP.	23.5853	TEMP. RISE	2.89369
SPIKE WGHT.		EE VALUE	2422.79
GROSS HEAT	12555.0	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	12:57:33	DETERMINATION	
SAMPLE ID	61	CAL ID	1
WEIGHT	1.0025	FUSE	19
ACID	14	SULFUR	0.00
INIT. TEMP.	24.0958	TEMP. RISE	2.88160
SPIKE WGHT.		EE VALUE	2436.61
GROSS HEAT	12547.6	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	13:05:13	DETERMINATION	
SAMPLE ID	62	CAL ID	2
WEIGHT	1.0032	FUSE	19
ACID	14	SULFUR	0.00
INIT. TEMP.	24.2672	TEMP. RISE	2.89916
SPIKE WGHT.		EE VALUE	2422.79
GROSS HEAT	12543.7	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	13:12:39	DETERMINATION	
SAMPLE ID	63	CAL ID	1
WEIGHT	1.0005	FUSE	20
ACID	14	SULFUR	0.00
INIT. TEMP.	24.4002	TEMP. RISE	2.88350
SPIKE WGHT.		EE VALUE	2436.61
GROSS HEAT	12579.2	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	13:19:44	DETERMINATION	
SAMPLE ID	64	CAL ID	2
WEIGHT	1.0006	FUSE	18
ACID	14	SULFUR	0.00
INIT. TEMP.	24.4891	TEMP. RISE	2.90497
SPIKE WGHT.		EE VALUE	2422.79
GROSS HEAT	12603.4	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	13:27:36	DETERMINATION	
SAMPLE ID	65	CAL ID	1
WEIGHT	1.0024	FUSE	21
ACID	13	SULFUR	0.00
INIT. TEMP.	24.5336	TEMP. RISE	2.84988
SPIKE WGHT.		EE VALUE	2436.61
GROSS HEAT	12408.3	BTU/LB	
DYNAMIC MODE			

CALORIMETRY FINAL REPORT

10/29/99	13:35:05	DETERMINATION	
SAMPLE ID	66	CAL ID	2
WEIGHT	1.0012	FUSE	18
ACID	13	SULFUR	0.00
INIT. TEMP.	24.8318	TEMP. RISE	2.86632
SPIKE WGHT.		EE VALUE	2422.79
GROSS HEAT	12429.3	BTU/LB	
DYNAMIC MODE			

GRAN'S PLOT TITRATION CALCULATIONS
ANALYST: RB 11-01-1999
BLANK RDG.= -.037
TITER = .5 MG CL/ML

SAMPLE ID	#	RDG.	SAMP.WT.	CL,%
J404-2	1	0.64	1.0033	0.034
-3	2	0.29	1.0050	0.016
-4	3	0.31	1.0033	0.017
-4R	4	0.21	1.0029	0.012
BABK	5	0.02	1.0094	<0.005
DIBK	6	-0.04	1.0000	<0.005
J404-2R	7	0.35	1.0008	0.019

GRAN'S PLOT CHLORIDE TITRATIONS

```
SAMPLE  1        1 / 299.4        2 / 319.2        3 / 331.2        4 / 343.6
 5 / 350.4       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .991841  POOR LINEARITY  ENDPOINT=  .6381632  ML

SAMPLE  2        1 / 302.9        2 / 323.6        3 / 335.2        4 / 343
 5 / 348.8       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9999303  GOOD LINEARITY  ENDPOINT=  .2894634  ML

SAMPLE  3        1 / 299.2        2 / 322          3 / 333.2        4 / 341
 5 / 346.7       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9999792  GOOD LINEARITY  ENDPOINT=  .3058525  ML

SAMPLE  4        1 / 299.3        2 / 320.3        3 / 330.8        4 / 338.4
 5 / 344.1       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9999592  GOOD LINEARITY  ENDPOINT=  .2132177  ML

SAMPLE  5        1 / 306.2        2 / 324.5        3 / 334.5        4 / 341.4
 5 / 346.7       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9999235  GOOD LINEARITY  ENDPOINT=  2.000907E-02  ML

SAMPLE  6        1 / 304.8        2 / 321.8        3 / 332          4 / 338.5
 5 / 343.9       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9998977  GOOD LINEARITY  ENDPOINT= -3.695083E-02  ML
```

GRAN'S PLOT CHLORIDE TITRATIONS

```
SAMPLE  1        1 / 294.5        2 / 317.3        3 / 328.8        4 / 336.9
 5 / 342.7       0 / 0            0 / 0            0 / 0
CORRELATION COEFF.=  .9999655  GOOD LINEARITY  ENDPOINT=  .3488336  ML
```

GRAN'S PLOT TITRATION CALCULATIONS
ANALYST: RB 11-01-1996
BLANK RDG.= .0086
TITER = .5 MG CL/ML

SAMPLE ID	#	RDG.	SAMP.WT.	CL,%
~~4255/99-1~~	~~1~~	~~0.70~~	~~0.5384~~	~~0.044~~
~~-2~~	~~2~~	~~0.70~~	~~0.5444~~	~~0.054~~
~~-3~~	~~3~~	~~1.04~~	~~0.5445~~	~~0.071~~
~~-4~~	~~4~~	~~1.44~~	~~0.5574~~	~~0.072~~
~~-5~~	~~5~~	~~1.44~~	~~0.6773~~	~~0.042~~
~~-6~~	~~6~~	~~1.44~~	~~0.6733~~	~~0.064~~
~~-6~~	~~6~~	~~1.44~~	~~0.4240~~	~~0.059~~
~~-7~~	~~7~~	~~1.45~~	~~0.4269~~	~~0.470~~
~~-7R~~	~~8~~	~~1.44~~	~~0.7015~~	~~0.446~~
1404/99-1	9	0.27	0.6638	0.018
-1R	10	0.09	0.5178	0.008
BABLE	11	0.01	1.0177	<0.005
DIBLE	12	0.01	1.0000	<0.005

GRAN'S PLOT COLOR DE [illegible]

SAMPLE 1 2 / 319 3 / 327.1 4 / 335.9 [illegible] / 342.4
6 / 347.4 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= [illegible] ML

SAMPLE 2 1 / 284.4 2 / 313.1 3 / 326.7 [illegible] / 337.[illegible]
5 / 341.5 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= [illegible] ML

SAMPLE 3 2 / 306.9 3 / 322.7 4 / 332.8 5 / 339.[illegible]
6 / 344.5 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= [illegible] ML

SAMPLE 4 2 / 307 3 / 322 4 / 331.9 5 / 338.3
6 / 343.2 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= [illegible] ML

SAMPLE 5 2 / 297.5 3 / 318.5 4 / 329.5 5 / 337.[illegible]
6 / 342.7 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 1.243112 ML

SAMPLE 6 2 / [illegible] 3 / 317.5 4 / 329.3 5 / 337.[illegible]
6 / 342.8 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= .3303643 ML

SAMPLE 7 2 / 296.9 3 / 314.1 4 / 326.1 5 / 334.[illegible]
6 / 340.1 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 1.452754 ML

SAMPLE 8 2 / 295.5 3 / 315.6 4 / 326.1 5 / 333.6
6 / 339.2 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 1.18077 ML

SAMPLE 9 1 / 296.7 2 / 317.5 3 / 328.6 4 / 336.1
5 / 341.8 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= .2460661 ML

SAMPLE 10 1 / 299.2 2 / 318.2 3 / 328.6 4 / 335.6
5 / 341.2 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 9.[illegible]E-02 ML

SAMPLE 11 1 / 301.7 2 / 320.1 3 / 330.3 4 / 337.7
5 / 342.8 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 7.216992E-02 ML

SAMPLE 12 1 / 303.5 2 / 321.3 3 / 331.2 4 / 338.[illegible]
5 / 343.6 0 / 0 0 / 0 0 / 0
CORRELATION COEF = [illegible] GOOD LINEARITY ENDPOINT= 8.[illegible]E-02 ML

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
COLD VAPOR AA B.V
DIG T/HNO3/HCL
MTX 10%HNO3 11/3/99
CODE 16

Calibration:		Blanks:
0	.001	1
.03	.027	10
.09	.080	10^2
.18	.160	10^3
		10^4

MERCURY
10-29-1999 # 8,237 J404/99
COAL
FOR EER
PROJECT 009-27
PRICE: 4 @ $ 18.00 EA.
TOTAL PRICE: $ 72.00

AA CALCULATIONS.FACTOR= 1

Sample Description	#	MATX.	EST.	IDEN.							HG AS HG,PPM
206172	1			1	0.020	0.022	1.0081	%100.0	100	0.02 1	<.1
74	2			2	0.020	0.022	1.0070	%100.0	100	0.02 1	<.1
73	3			3	0.023	0.025	1.0063	%100.0	100	0.02 1	<.1
76	4			4	0.027	0.030	1.0093	%100.0	100	0.03 1	<.1
	5			4R	0.025	0.028	1.0023	%100.0	100	0.03 1	<.1
	6		1630	3M	0.073	0.082	1.0005	%100.0	100	0.08 1	<.1
	7			BK	0.005	0.005	1.0136	%100.0	100	1	<.1

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /
CALIBRATION CURVE:

0.000	0.001
0.030	0.027
0.090	0.080
0.180	0.160

ENTRY NUMBER 8237
COMPLETE 11-03-1999

Special Instructions: Please identify hazardous sample components:

INTERMOUNTAIN POWER SERVICE CORPORATION
FUELS LABORATORY
ULTIMATE ANALYSIS

Lab Number: 25715

Identification: AFS 17:00

Date Sampled: 10-13-99

<<<<< DATA TABLE >>>>>

ANALYSIS	AS RECEIVED	DRY BASIS
% Total Moisture	6.70	
% Carbon	67.59	72.44
% Hydrogen	4.94	5.29
% Nitrogen	1.31	1.40
% Ash	8.65	9.27
% Sulfur	0.52	0.55
% Oxygen (by difference)	10.29	11.05

13040 d
13972
+68

NOTE: (As Received Basis)

Hydrogen and Oxygen DO NOT Include H and Ox in sample moisture.

AS FIRED SAMPLE FINAL REPORT

IPSC FUELS LAB

Date Analyzed: 10-14-99

Sample Lab Number: 25715

Lab Analyst Intials: WRC

Date Sampled: 10-13-99

Time Collected: 17:00

Short Proximate Analysis

	As Received	Dry Basis
% Total Moisture	6.70%	XXXX
% Ash	8.65%	9.27%
% Sulfur	0.52%	0.55%
BTU/lb	12102	12972
Moisture Ash Free BTU/lb	14297	
% Residual Moisture	1.79%	

Sampler operated properly during sampling period.

INTERMOUNTAIN POWER SERVICE CORPORATION
FUELS LABORATORY
ULTIMATE ANALYSIS

Lab Number: 25722

Identification: AFS 17:00

Date Sampled: 10/4/99

<< << << DATA TABLE >> >> >> >>

ANALYSIS	AS RECEIVED	DRY BASIS
% Total Moisture	6.65	
% Carbon	67.71	72.53
% Hydrogen	4.72	5.06
% Nitrogen	1.26	1.35
% Ash	8.66	9.28
% Sulfur	0.48	0.51
% Oxygen (by difference)	10.52	11.27

12893d
12932

NOTE: (As Received Basis)

Hydrogen and Oxygen DO NOT Include H and Ox in sample moisture.

AS FIRED SAMPLE FINAL REPORT

IPSC FUELS LAB

Date Analyzed: 10-15-99

Sample Lab Number: 25722

Lab Analyst Intials: KS

Date Sampled: 10-14-99

Time Collected: 17:00

Short Proximate Analysis

	As Received	Dry Basis
% Total Moisture	6.65%	XXXX
% Ash	8.66%	9.28%
% Sulfur	0.48%	0.51%
BTU/lb	12072	12932

Moisture Ash Free BTU/lb 14254

% Residual Moisture 1.67%

Sampler operated properly during sampling period.

INORGANIC DATA PACKAGE
FOR
GE ENERGY ENVIRONMENTAL RESEARCH

Project: 3749-040

Philip Analytical Services Corporation
5555 North Service Road
Burlington, ON L7L 5H7

Submission #9J1198

Prepared by: Janice Joseph - CSR Initial : _____

Approved by : Dr. Ron McLeod - Principal Scientist Initial : _____

1. CASE NARRATIVE

PROJECT NARRATIVE

PHILIP Analytical Services (Burlington ON)
Philip Project: AN991211
Philip Submission #:9J1198

Client: Energy Environmental Research
Client Project: 3749-040

I. SAMPLE RECEIPT/ANALYSIS

a) Sample Listing

Philip ID	Client Sample ID	Date Sampled	Date Received	Date Prepped	Run Date
Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- Front Half					
064669 99	Method Blank	99 10 12	99 10 28	99/12/09	99/12/09
064670 99	Reagent Blank OHM	99 10 12	99 10 28	99/12/09	99/12/09
064676 99	FB-SO-OHM	99 10 12	99 10 28	99/12/09	99/12/09
064678 99	R2-SO-OHM	99 10 13	99 10 28	99/12/09	99/12/09
064679 99	R3-SO-OHM	99 10 13	99 10 28	99/12/09	99/12/09
064680 99	R4-SO-OHM	99 10 14	99 10 28	99/12/09	99/12/09
064670 99	Reagent Blank OHM	99 10 12	99 10 28	99/12/09	99/12/09
064671 99	FB-SI-OHM	99 10 12	99 10 28	99/12/09	99/12/09
064673 99	R2-SI-OHM	99 10 13	99 10 28	99/12/09	99/12/09
064674 99	R3-SI-OHM	99 10 13	99 10 28	99/12/09	99/12/09
064675 99	R4-SI-OHM	99 10 14	99 10 28	99/12/09	99/12/09
Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- Hydroxylamine					
064669 99	Method Blank	99 10 12	99 10 28	99/11/18	99/11/19
064670 99	Reagent Blank OHM	99 10 12	99 10 28	99/11/18	99/11/19
Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- KCl Impingers/Rinses					
064669 99	Method Blank	99 10 12	99 10 28	99/11/17	99/11/17
064670 99	Reagent Blank OHM	99 10 12	99 10 28	99/11/17	99/11/17
064671 99	FB-SI-OHM	99 10 12	99 10 28	99/11/17	99/11/17
064673 99	R2-SI-OHM	99 10 13	99 10 28	99/11/17	99/11/17
064674 99	R3-SI-OHM	99 10 13	99 10 28	99/11/17	99/11/17
064675 99	R4-SI-OHM	99 10 14	99 10 28	99/11/17	99/11/17
064676 99	FB-SO-OHM	99 10 12	99 10 28	99/11/17	99/11/18
064678 99	R2-SO-OHM	99 10 13	99 10 28	99/11/17	99/11/17
064679 99	R3-SO-OHM	99 10 13	99 10 28	99/11/17	99/11/17
064680 99	R4-SO-OHM	99 10 14	99 10 28	99/11/17	99/11/17
Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- KMNO4 Impingers/Rinses					
064669 99	Method Blank	99 10 12	99 10 28	99/11/11	99/11/11
064670 99	Reagent Blank OHM	99 10 12	99 10 28	99/11/11	99/11/11

064671 99	FB-SI-OHM	99/10/12	99/10/28	99/11/11	99/11/11
064673 99	R2-SI-OHM	99/10/13	99/10/28	99/11/11	99/11/11
064674 99	R3-SI-OHM	99/10/13	99/10/28	99/11/11	99/11/11
064675 99	R4-SI-OHM	99/10/14	99/10/28	99/11/11	99/11/11
064676 99	FB-SO-OHM	99/10/12	99/10/28	99/11/11	99/11/11
064678 99	R2-SO-OHM	99/10/13	99/10/28	99/11/11	99/11/11
064679 99	R3-SO-OHM	99/10/13	99/10/28	99/11/11	99/11/11
064680 99	R4-SO-OHM	99/10/14	99/10/28	99/11/11	99/11/11
064701 99	Blank Batch B	99/10/12	99/10/28	99/11/18	99/11/18
064702 99	Blank Batch #1	99/10/13	99/10/28	99/11/18	99/11/18
064703 99	Blank Batch #2	99/10/13	99/10/28	99/11/18	99/11/18
064705 99	Batch Blank 991014	99/10/13	99/10/28	99/11/18	99/11/18

Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- HNO3/H202 Impingers/Rinses

064669 99	Method Blank	99/10/12	99/10/28	99/11/10	99/11/10
064670 99	Reagent Blank OHM	99/10/12	99/10/28	99/11/10	99/11/10
064671 99	FB-SI-OHM	99/10/12	99/10/28	99/11/10	99/11/10
064673 99	R2-SI-OHM	99/10/13	99/10/28	99/11/10	99/11/10
064674 99	R3-SI-OHM	99/10/13	99/10/28	99/11/10	99/11/10
064675 99	R4-SI-OHM	99/10/14	99/10/28	99/11/10	99/11/10
064676 99	FB-SO-OHM	99/10/12	99/10/28	99/11/10	99/11/10
064678 99	R2-SO-OHM	99/10/13	99/10/28	99/11/10	99/11/10
064679 99	R3-SO-OHM	99/10/13	99/10/28	99/11/10	99/11/10
064680 99	R4-SO-OHM	99/10/14	99/10/28	99/11/10	99/11/10

Draft ASTM Mercury Speciation Method (September1, 1999 Revision)- Probe Rinse

064670 99	Reagent Blank OHM	99/10/12	99/10/28	99/12/09	99/12/09
064704 99	RB-OHM-7 HNO3	99/10/13	99/10/28	99/12/09	99/12/09

Run Date is defined as the date of injection of the last calibration standard (12 hour or less) prior to the samples analyzed within that run sequence. Therefore the time of calibration injection that defines the run date is always within 12 hours of the time of sample injection.

b) Shipping Problems: none encountered

c) Documentation Problems: none encountered

II. SAMPLE PREP:

No problems encountered

III. SAMPLE ANALYSIS:

See also comments within the appropriate Certificate of Analysis.

a) Hold Times:
All impingers portions were analyzed within this recommended hold time of 45 days. The filter and rinses were analyzed 56-8 days following sampling while the ash portions were analyzed within the recommended hold times. Since the front half portions of the sample are within the 'heated zone' of the sampling train and since volatile mercury would have been stripped from this section, there should be no compromise to data quality for this exceedance. Note that it is concern for the 'volatile' Hg portions that the recommended hold time of 45 days was targeted. Fly ash is well known to provide Hg in a stable solid matrix. The solid NIST reference material 1633b is a fly ash and is recognized as stable to certified levels for periods of years.

b) Instrument Calibration: all within control limits

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above.
In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the cognizant laboratory official or his her designee, as verified by this signature.

Ronald A. McLeod, Principal Sci., Ph.D.,C.Chem.

6-4-13
Date

2. ANALYTICAL DATA REPORT

Certificate of Analysis

CLIENT INFORMATION		LABORATORY INFORMATION	
Attention:	Bob Zimperman	**Contact:**	Ron McLeod
Client Name:	Energy Environmental Research	**Project:**	AN991211
Project:	3749-040	**Date Received:**	99 10 28
Project Desc:	Intermountain Power Plant - Utah	**Date Reported:**	99 12 10
Address:	8001 Irvine Blvd Irvine, CA 92618-1204	**Submission No.:**	9J119S
		Sample No.:	064669-064671
Fax Number:	949-857-1943		
Phone Number:	949-552-1803		

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can by determined for all analytes by multiplying the appropriate MDL X 3.33
Solids data is based on dry weight except for biota analyses.
Organic analyses are not corrected for extraction recovery standards except for isotope dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State ELAP Identification Number 10756.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS: Revision 99 12 10:KMNO4 Data

Certified by: _____

PASC - Certificate of Analysis

			Method	Blank	Blank	Blank	Blank	Reagent	FB	R2	R2
Client ID:			Blank	Spike #1	Spike #1	Spike #2	Spike #2	Blank OHM	SI-OHM	SI-OHM	SI-OHM
Lab No.:			064669 99	064669 99	064669 99	064669 99	064669 99	064670 99	064671 99	064673 99	064673 99
Date Sampled:			-	-	-	-	-	99/10/12	99/10/12	99/10/13	99/10/13
Component	**MDL**	**Units**			% Recoveries		% Recoveries				Duplicate
Mercury - FH (Outlet)	0.010	ug	-	0.10	100	0.10	100	-	-	-	-
Mercury - FH (Inlet)	0.010	"	-	-	-	-	-	<0.040	<0.040	<0.040	<0.040
Mercury - hydroxylamine	0.010	"	-	0.097	97	0.10	100	2.7	-	-	-
Mercury - KCl	0.030	"	-	0.30	100	0.31	100	<0.10	<0.10	2.0	2.0
Mercury - KMnO4	0.03	"	<0.1	0.31	100	0.31	100	<0.1	<0.1	0.14	0.14
Mercury - H202	0.010	"	-	0.10	100	0.10	100	<0.25	<0.25	<0.25	<0.25
Mercury - probe rinse	0.010	"	-	-	-	-	-	-	-	-	-

00007

PASC - Certificate of Analysis

			R2	R2	R2	R2	R3	R4	FB	R2	R2
Client ID:			SI-OHM	SI-OHM	SI-OHM	SI-OHM	SI-OHM	SI-OHM	SO-OHM	SO-OHM	SO-OHM
Lab No.:			064673.99	064673.99	064673.99	064673.99	064674.99	064675.99	064676.99	064678.99	064678.99
Date Sampled:			99/10/13	99/10/13	99/10/13	99/10/13	99/10/13	99/10/14	99/10/12	99/10/13	99/10/13
Component	**MDL**	**Units**	M/Spike	MS % Rec	MS/Dup	MSD % Rec					Duplicate
Mercury - FH (Outlet)	0.010	ug	-	-	-	-	-	-	-	0.030	0.027
Mercury - FH (Inlet)	0.010	"	0.44	110	0.44	110	< 0.040	< 0.040	-	-	-
Mercury - hydroxylamine	0.010	"	-	-	-	-	-	-	-	-	-
Mercury - KCl	0.030	"	3.0	100	3.0	100	2.5	2.7	< 0.10	< 0.10	-
Mercury - KMnO4	0.03	"	0.76	95	0.76	95	0.3	0.2	0.37	0.34	-
Mercury - H202	0.010	"	2.4	96	2.4	97	< 0.25	< 0.25	< 0.25	< 0.25	-
Mercury - probe rinse	0.010	"	-	-	-	-	-	-	-	-	-

00008

PASC - Certificate of Analysis

			R2	R2	R2	R2	R3	R4	Blank	Blank
Client ID:			SO-OHM	SO-OHM	SO-OHM	SO-OHM	SO-OHM	SO-OHM	Batch B	Batch B
Lab No.:			064678 99	064678 99	064678 99	064678 99	064679 99	064680 99	064701 99	064701 99
Date Sampled:			99/10/13	99/10/13	99/10/13	99/10/13	99/10/13	99/10/14	99/10/12	99/10/12
Component	**MDL**	**Units**	M. Spike	MS % Rec.	MS Dup	MSD % Rec.				Duplicate
Mercury - FH (Outlet)	0.010	ug	0.14	110	0.13	100	0.016	0.023	-	-
Mercury - FH (Inlet)	0.010	"	-	-	-	-	-	-	-	-
Mercury - hydroxylamine	0.010	"	-	-	-	-	-	-	-	-
Mercury - KCl	0.030	"	-	-	-	-	0.19	0.19	-	-
Mercury - KMnO4	0.03	"	-	-	-	-	0.8	0.67	<0.05	<0.05
Mercury - H202	0.010	"	-	-	-	-	<0.25	<0.25	-	-
Mercury - probe rinse	0.010	"	-	-	-	-	-	-	-	-

00009

PASC - Certificate of Analysis

			Blank	Blank	Blank	Blank	Blank	Blank	RB-OHM-7	Batch Blank
Client ID:			Batch B	Batch B	Batch B	Batch B	Batch #1	Batch #2	HNO3	991014
Lab No.:			064701 99	064701 99	064701 99	064701 99	064702 99	064703 99	064704 99	064705 99
Date Sampled:			99 10 12	99 10 12	99 10 12	99 10 12	99 10 13	99 10 13	99 10 13	99 10 13
Component	**MDL**	**Units**	M Spike	MS % Rec	MS Dup	MSD % Rec				
Mercury - FH (Outlet)	0.010	ug	-	-	-	-	-	-	-	-
Mercury - FH (Inlet)	0.010	"	-	-	-	-	-	-	-	-
Mercury - hydroxylamine	0.010	"	-	-	-	-	-	-	-	-
Mercury - KCl	0.030	"	-	-	-	-	-	-	-	-
Mercury - KMnO4	0.03	"	0.51	100	0.5	100	<0.05	<0.05	-	<0.05
Mercury - H202	0.010	"	-	-	-	-	-	-	-	-
Mercury - probe rinse	0.010	"	-	-	-	-	-	-	-	-

Date of Sample Prep:	99/11/11	99/11/18
Batch Code:	**11101NPO**	
Mercury - H202	064669 99	
	064670 99	
	064671 99	
	064673 99	
	064674 99	
	064675 99	
	064676 99	
	064678 99	
	064679 99	
	064680 99	
Run Date:	99 11/10	
Date of Sample Prep:	99 11/10	
Batch Code:	**12093NPR**	
Mercury - probe rinse	064670 99	
	064704 99	
Run Date:	99 12 09	
Date of Sample Prep:	99 12 09	

Batch Code:	**12091NFT**	**12091NFT**
Mercury - filter	064669 99	064670 99
		064676 99
		064678 99
		064679 99
		064680 99
Run Date:	99/12/09	99/12/09
Date of Sample Prep:	99/12/09	99/12/09

Batch Code:	**12092NFB**
Mercury - filter - bulk	064670 99
	064671 99
	064673 99
	064674 99
	064675 99
Run Date:	99/12/09
Date of Sample Prep:	99/12/09

Batch Code:	**11181BHY**
Mercury - hydroxylamine	064669 99
	064670 99
Run Date:	99/11/19
Date of Sample Prep:	99/11/18

Batch Code:	**11172NKC**	**11172NKC**
Mercury - KCl	064669 99	064676 99
	064670 99	
	064671 99	
	064673 99	
	064674 99	
	064675 99	
	064678 99	
	064679 99	
	064680 99	
Run Date:	99/11/17	99/11/18
Date of Sample Prep:	99/11/17	99/11/17

Batch Code:	**11111NM4**	**11183BMN**
Mercury - KMnO4	064669 99	064701 99
	064670 99	064702 99
	064671 99	064703 99
	064673 99	064705 99
	064674 99	
	064675 99	
	064676 99	
	064678 99	
	064679 99	
	064680 99	
Run Date:	99/11/11	99/11/18

	Client ID:		NIST 1633b Coal Ash	NIST 1633b Coal Ash
	Lab No.:		060279 99	060279 99
	Date Sampled:		99/10/15	99/10/15
Component	**MDL**	**Units**		Certified Value
Mercury	0.04	mg/kg	0.12	0.141

3. RAW DATA

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
J64669	EER-CA2	MB R456	Mercury -	PV	-0.010	-99999.0	0.103	103.	0.102	102.	99/12/09	1NFT	99/12/09	MG01	58.	42.	*BLKIMP*
J64670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.010						99/12/09	1NFT	99/12/09	MG02	58.	42.	
064676	EER-CA2	FB-SO-OHM	Mercury -	PV	-0.010						99/12/09	1NFT	99/12/09	MG02	58.	42.	
064678	EER-CA2	R2-SO-OHM	Mercury -	PV	0.030	0.027	0.135	106.	0.133	104.	99/12/09	1NFT	99/12/09	MG02	57.	42.	
064679	EER-CA2	R3-SO-OHM	Mercury -	PV	0.016						99/12/09	1NFT	99/12/09	MG02	57.	42.	
064680	EER-CA2	R4-SO-OHM	Mercury -	PV	0.023						99/12/09	1NFT	99/12/09	MG02	56.	42.	
BL1209	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.103	103.	0.102	102.	99/12/09	1NFT	99/12/09	MG02	$$$	$$$	*BLKIMP*

7 Tests for OHFLT with an MDL of 0.010 ug Validated By CMA Control Chart Updated N/A IO Requirements met N/A

000.3

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.040						99/12/09	2NFB	99/12/09	MG02	58.	42.	
064671	EER-CA2	FB-SI-OHM	Mercury -	PV	-0.040						99/12/09	2NFB	99/12/09	MG02	58.	42.	
064673	EER-CA2	R2-SI-OHM	Mercury -	PV	-0.040	-0.040	0.436	107.	0.436	107.	99/12/09	2NFB	99/12/09	MG02	57.	42.	
064674	EER-CA2	R3-SI-OHM	Mercury -	PV	-0.040						99/12/09	2NFB	99/12/09	MG02	57.	42.	
064675	EER-CA2	R4-SI-OHM	Mercury -	PV	-0.040						99/12/09	2NFB	99/12/09	MG02	56.	42.	
3L1209	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.097	97.	0.100	100.	99/12/09	2NFB	99/12/09	MG02	$$$	$$$	*BLKIMP*

6 Tests for OHFLTB with an MDL of 0.010 ug Validated By CMB Control Chart Updated N/A IO Requirements met N/A

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.010						99/12/09	3NPR	99/12/09	MG02	58.	42.	
064704	EER-CA2	RB-OHM-7 HNO3	Mercury -	PV	-0.010						99/12/09	3NPR	99/12/09	MG02	57.	42.	
BL1209	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.103	103.	0.104	104.	99/12/09	3NPR	99/12/09	MG02	$$$	$$$	*BLKIMP*

3 Tests for OHPROBE with an MDL of 0.010 ug Validated By CMS Control Chart Updated N/A IO Requirements met N/A

000.5

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.12.09(WA) Run Code: MG02 Matrix: IMP

Analyst: MG Units: µg (see comments) MDL: 0.01

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.6		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.6		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.6		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG REF			
14			BL1209	INFT.		
15			BL1209			
16			BL1209 S			
17			"			
18			BL1209 DS			
19			"			
20			64678			
21			"			
22			78 D			
23			"			
24			78 S			
25			"			
26			78 DS			
27			"			
28			64669			
29			"			
30			64670			
31			"			
32			64676			
33			"			
34			CCV			
35			B			
36			D4			
37			64679			
38			"			
39			64680			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			BL1209	2NFB		
42			"			
43			BL1209 S			
44			"			
45			BL1209 DS			
46			"			
47			64673			
48			"			
49			64673 D			
50			"			
51			64673 DS			
52			"			
53			64673 DS			
54			"			
55			64670			
56			"			
57			CCV			
58			B			
59			D4 64671			
60			64674			
61			"			
62			64675			
63			"			
64			BL1209	3NPR		
65			"			
66			BL1209 S			
67			"			
68			BL1209 DS			
69			"			
70			64670			
71			"			
72			64704			
73			"			
74			64881			
75			"			
76			64892			
77			"			
78			~~BL1209~~	~~1B3BMD~~		
79			"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

[illegible] mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.12.09(WA) Run Code: MG02 Matrix: IMP

Analyst: MG Units: µg (see comments) MDL: 0.05

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
81 ~~21~~			CCV MA			
22			B			
23			D4			
24			BL1209	1B3B		
25			"			
26			BL1209 S			
27			"			
28			BL1209 DS			
29			"			
30			70192			
31			"			
32			70192 D			
33			"			
34			70192 S			
35			"			
36			70192 DS			
37			"			
38			69884			
39			"			
40			70191			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			70191			
42			70193			
43			"			
44			CCV			
45			B			
46			D4			
47			70194			
48			"			
49			69885			
50			"			
51			69886			
52			"			
53			69886 D			
54			"			
55			69886 S			
56			"			
57			69886 DS			
58			"			
59		1/5	69887			
60		↓	"			
61		1/20	69888			
62		↓	"			
63			BL1209	2B3B		
64			"			
65			BL1209 S			
66			"			
67			CCV			
68			B			
69			D4			
70			BL1209 DS			
71			"			
72		1/5	70236			
73			"			
74			70236 D			
75			"			
76			70236 S			
77			"			
78			70236 DS			
79			"			
80			70235			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

EPA 7470 WATER PREPARATION LOG - MERCURY

000 8 DG7470HG
DGHGLEACH, DG29HG***

Calibration Solutions:

#	I.D.	*Conc.	Spike	**Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
7	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List

- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples bulked and mixed
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	INFT	20 ml	30 ml	1 X	1.5 ppb = 600 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	10	BL 1209	"	"	"	"	(Processed Blank)
	11	BL 1209 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	12	64678	"	"	"	"	100 mls
1	13	D	"	"	"	"	(Duplicate sample)
1	14	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	15	DS	"	"	"	"	(Duplicate Spiked sample)
2	16	64669	"	"	"	"	
3	17	64670	"	"	"	"	
4	18	64676	"	"	"	"	
5	19	79	"	"	"	"	
6	20	80	"	"	"	"	
7	21		"	"	"	"	
8	22		"	"	"	"	
9	23		"	"	"	"	
10	24		"	"	"	"	
	25	CCV (Cont. Calib. Verif.)	INFB	20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	26	BL 1209	"	"	"	"	(Processed Blank)
	27	BL 1209 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	28	64673	"	"	"	"	400 mls
1	29	D	"	"	"	"	(Duplicate sample)
1	30	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	31	DS	"	"	"	"	(Duplicate Spiked sample)
2	32	64670	"	"	"	"	
3	33	64671	"	"	"	"	
4	34	74	"	"	"	"	
5	35	75	"	"	"	"	
6	36		"	"	"	"	
7	37		"	"	"	"	
8	38		"	"	"	"	
9	39		"	"	"	"	
10	40		"	"	"	"	

Notes: Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C
DG29HGI, DG29HGF, DG101AA1, DG101AA2

Include External Reference Material (EPA WS 378 or SPEX CertiPrep TM - WS) per run

Prepare 0.05 ppm standards daily

HNO3 Lot. No.	H2SO4 Lot. No.	Bath Temps.
119090	AN 318064	1 195°C

Prepared By: [illegible] Date: 991209 Checked by: [illegible]

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	41	CCV (Cont. Calib. Verif.)	3N PR	20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	42	BL 1209	"	"	"	"	(Processed Blank)
	43	BL 1209 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	44	64670	"	"	"	"	100mls
1	45	D	"	"	"	"	(Duplicate sample)
1	46	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	47	DS	"	"	"	"	(Duplicate Spiked sample)
2	48	64704	"	"	"	"	
3	49	64851	"	"	"	"	
4	50	64892	"	"	"	"	
5	51		"	"	"	"	
6	52		"	"	"	"	
7	53		"	"	"	"	
8	54		"	"	"	"	
9	55		"	"	"	"	
10	56		"	"	"	"	

Comments

* concentration based on 30 ml final volume, ** concentration based on 20 ml final volume

*** group of several Method 29 testcodes

Dilution factor of 1.5 is corrected by entering the calibration concentrations listed above

Procedure/Methodology:

1 Prepare 25 ppm Intermediate stock (if required) by pipetting 625 ul., of 1000 ppm Stock to 25 ml final volume of 2% HNO3
2 Prepare 0.05 ppm Working stock daily by pipetting 200 ul., of 25 ppm Stock to 100 ml final volume of 2% HNO3
3 Using the LIMS Screen "SCNDIG" enter the required samples into LIMS
4 Using the labeling program, "DIGLBL", retreive the "SCNDIG" list and create labels for the required samples.
5 Label the falcon tubes appropriately
6 Transfer a 20 ml. aliquot of well mixed sample into the designated falcon tube
7 Spike the tubes as indicated in the comment sector of the digestion sheet
8 Add 0.5 ml. of conc. Nitric Acid (HNO3), and 1 ml. of conc. Sulphuric acid, (H2SO4), to each tube
9 Add 3 ml. Potassium Permanganate (KMnO4), colour should remain for at least 15 minutes
10 Add 1.5 ml. of Potassium persulphate, (K2S2O8), to each tube
11 Mix samples, cap loosely and place in a water bath @ 95 degrees C for 2 hours
12 Remove tubes and allow to cool to room temperature
13 Add 1.0 ml. 20% Hydroxylamine Hydrochloride to each tube
14 Recap tubes and shake until the Potassium Permanganate (KMnO4) is destroyed and sample becomes colourless
15 Dilute the sample to a final volume of 30 ml., cap and mix well

REFERENCE STANDARDS/SPIKING SOLUTIONS:

Source: Inorganic Ventures Standard, see standard tracking binder for current lot and expiry date information

ICV/CCV STANDARDS:

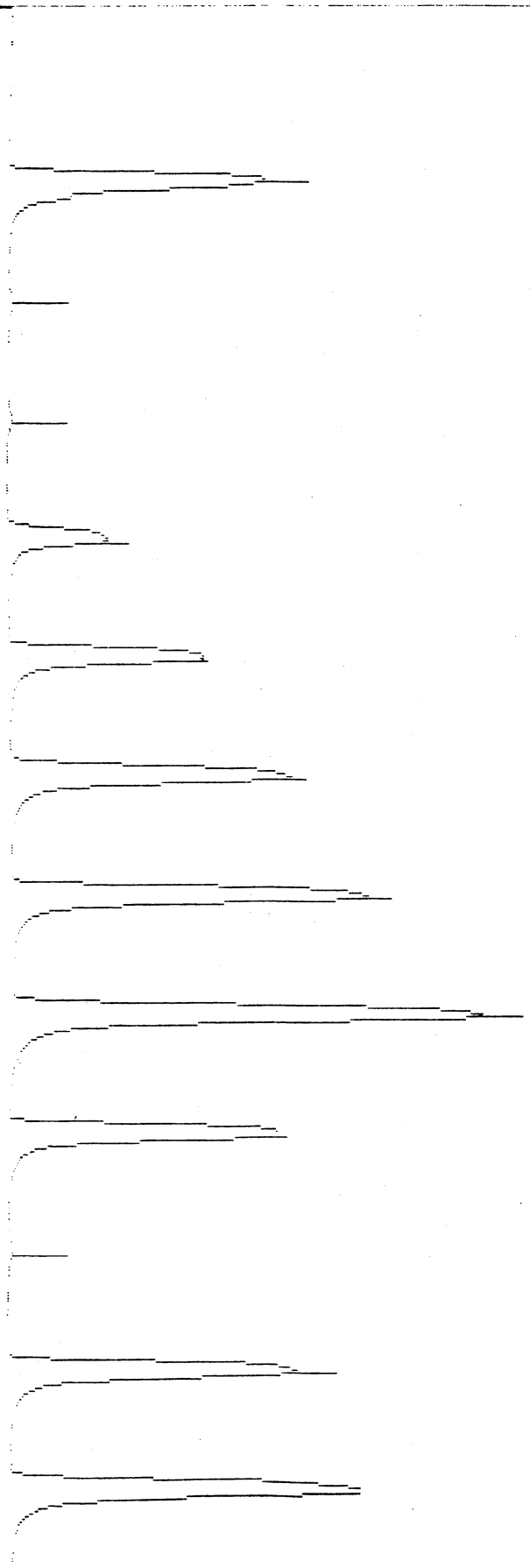
Source: High Purity MESS-ZENO 30/QCA Standard, see standard tracking binder for current lot

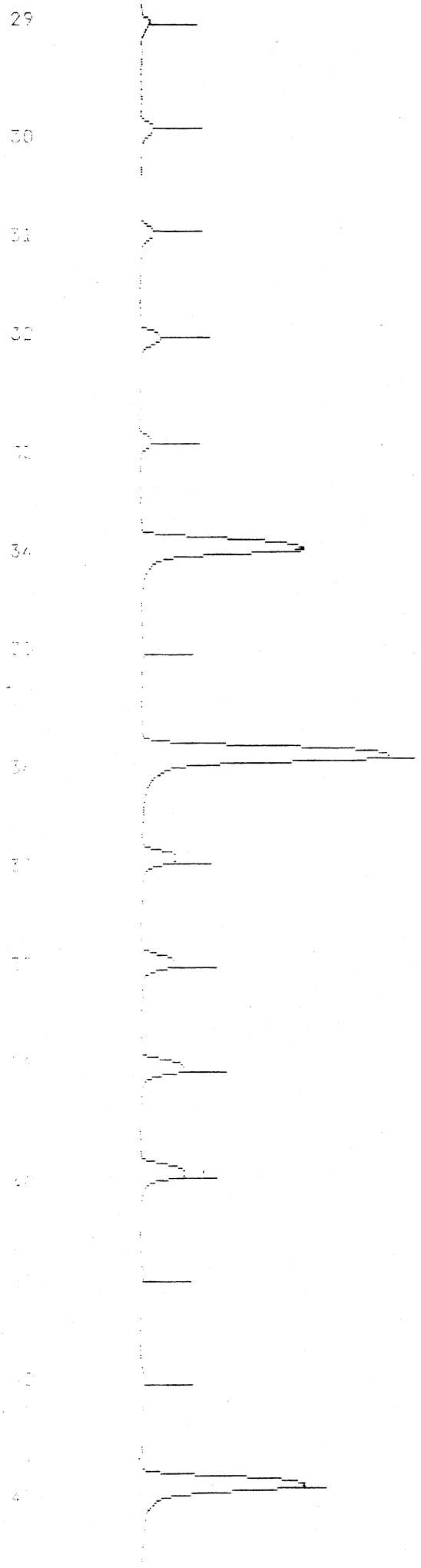
INTERNAL REFERENCE STANDARD: (2 ppb in 10% HNO3)

Source: EPA WS 378 or SPEX CertiPrep Trace Metal - Water Supply, see standard tracking binder for current source, lot and expiry date information.

All reagents used are of a grade suitable for mercury analyses

RUN DATE: 12-09-1999 CHART DATE: 12-10-1999
CHART SPEED: 30
DATA FILE NAME: C:\ DPI\DATA\991209WA.DAT

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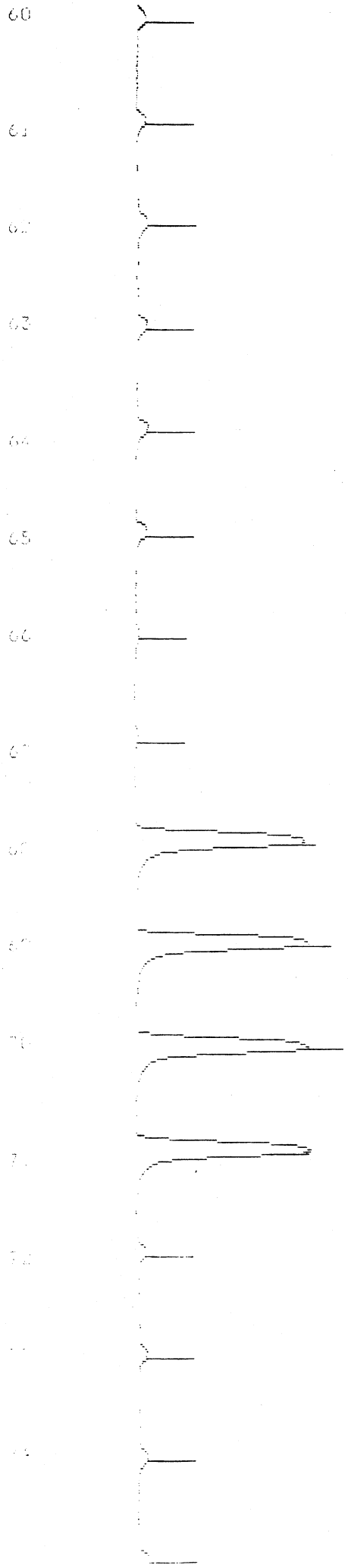
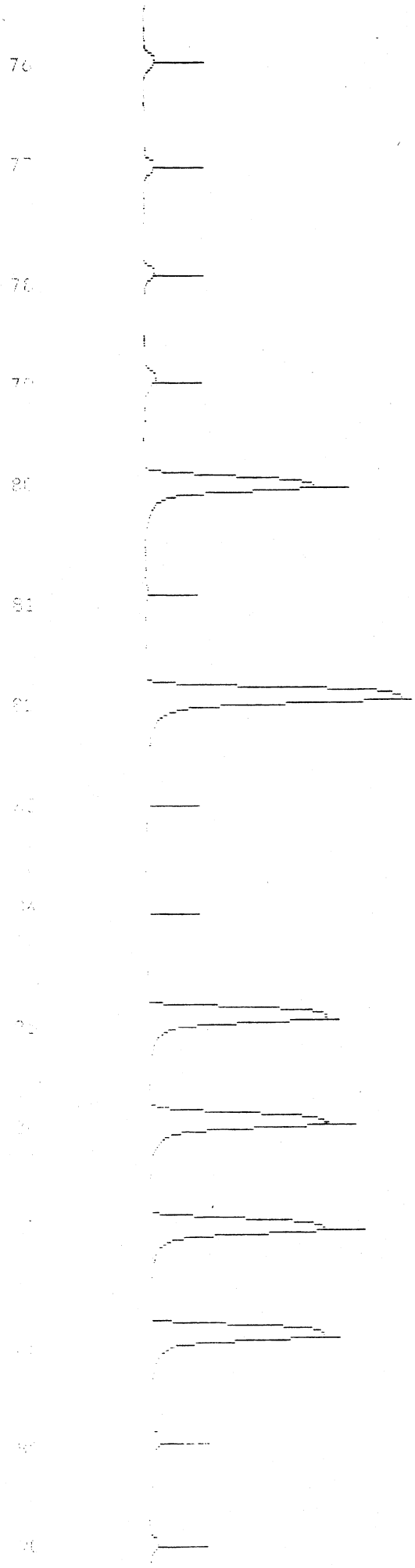
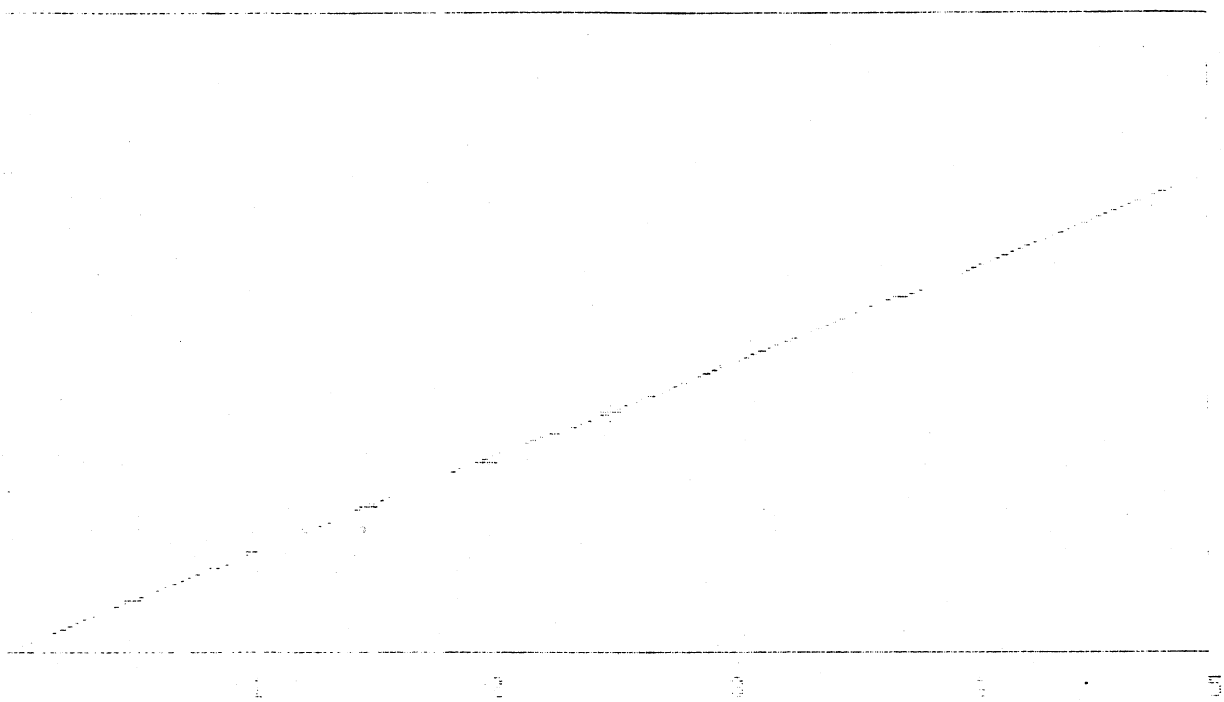


[illegible]	[illegible]	1	1	8.0		0.155	1.336	106%
[illegible]	[illegible]	1	1	8.2		0.133	1.360	104%
[illegible]	[illegible]	1	1	7.8			1.295	
[illegible]	[illegible]	1	1	0.2		<0.01	0.011	I
[illegible]	[illegible]	1	1	0.2			0.023	I
[illegible]	[illegible]	1	1	0.4		<0.01	0.044	I
[illegible]	[illegible]		1	0.3			0.031	I
[illegible]	[illegible]		1	0.7		<0.01	0.101	I
[illegible]	[illegible]		1	0.3			0.040	I
[illegible]	[illegible]			[illegible]			[illegible]	97%
[illegible]	[illegible]		1	[illegible]			-0.018	D
[illegible]	[illegible]			9.1			1.112	B
[illegible]	[illegible]		1	1.1		0.016	0.163	
[illegible]	[illegible]		1	1.1			0.163	
[illegible]	[illegible]		1	1.5		0.023	0.229	
[illegible]	[illegible]			[illegible]			0.229	
[illegible]	[illegible]			[illegible]		<0.01	-0.010	I
[illegible]	[illegible]			0.1			-0.006	I
[illegible]	[illegible]			[illegible]		0.097	[illegible]	97%
[illegible]	[illegible]			[illegible]			0.992	
[illegible]	[illegible]	1		6.0		0.100	0.994	100%
[illegible]	[illegible]			6.1			1.002	B
[illegible]	[illegible]			[illegible]		<0.04	0.031	I
[illegible]	[illegible]		1	[illegible]			0.035	I
[illegible]	[illegible]			0.3		<0.04	0.031	I
[illegible]	[illegible]			1.3			0.040	I
[illegible]	[illegible]			[illegible]		0.436	[illegible]	107%
[illegible]	[illegible]			[illegible]			1.093	
[illegible]	[illegible]			[illegible]		0.436	[illegible]	107%
[illegible]	[illegible]			[illegible]			[illegible]	
[illegible]	[illegible]			[illegible]		<0.04	[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	95%
[illegible]	[illegible]			1.0			-0.018	D
[illegible]	[illegible]			[illegible]			1.113	I
[illegible]	[illegible]			[illegible]		<0.04	[illegible]	I
[illegible]	[illegible]			[illegible]			0.031	I
[illegible]	[illegible]			[illegible]		<0.04	[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	I
[illegible]	[illegible]			[illegible]		<0.04	[illegible]	I
[illegible]	[illegible]	1		[illegible]			[illegible]	I
[illegible]	[illegible]			[illegible]		<0.01	[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	I
[illegible]	[illegible]			[illegible]		0.103	[illegible]	103%
[illegible]	[illegible]			[illegible]			1.039	
[illegible]	[illegible]			[illegible]		0.104	[illegible]	104%
[illegible]	[illegible]			6.3			1.04[illegible]	
[illegible]	[illegible]			[illegible]		<0.01	[illegible]	
[illegible]	[illegible]			0.2			[illegible]	I
[illegible]	[illegible]			[illegible]		<0.01	[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	I
[illegible]	[illegible]			[illegible]		<0.01	[illegible]	
[illegible]	[illegible]			0.			[illegible]	I
[illegible]	[illegible]			[illegible]		<0.01	[illegible]	I
[illegible]	[illegible]			[illegible]			[illegible]	
[illegible]	[illegible]			[illegible]			[illegible]	97%
[illegible]	[illegible]			[illegible]			[illegible]	
[illegible]	[illegible]			[illegible]			1.017	
[illegible]	[illegible]			[illegible]		<0.05	[illegible]	
[illegible]	[illegible]			[illegible]			-0.010	I
[illegible]	[illegible]			6.3		0.520	[illegible]	103%
[illegible]	[illegible]			[illegible]			1.039	
[illegible]	[illegible]			6.1		0.502	[illegible]	101%
[illegible]	[illegible]			6.1			[illegible]	
[illegible]	[illegible]			0.		<0.05	[illegible]	I

68684, 70190





			ppb	
		TUG		
64669		<0.01		
		0.103		103%
		0.102		102%
		0.030		
		0.027		

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064669	EER-CA2	MB R456	Mercury -	PV	-0.010	-99999.0	0.097	97.	0.101	101.	99/11/18	1BHY	99/11/19	MG01	37.	21.	*BLKIMP*
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	2.675						99/11/18	1BHY	99/11/19	MG01	37.	21.	
BL1118	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.097	97.	0.101	101.	99/11/18	1BHY	99/11/19	MG01	$$$	$$$	*BLKIMP*

3 Tests for OHHYX with an MDL of 0.010 ug Validated By CMB Control Chart Updated N/A IO Requirements met N/A

00027

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.19 Run Code: MG01 Matrix: IMP.

Analyst: MG Units: µg (see comments) MDL: 0.01

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG. REF.			
14			BL1119	INPO.		
15			"			
16			BL1119 S			
17			"			
18			BL1119 DS			
19			"			
20	10		65702			
21			"			
22			65702 D			
23			"			
24			65702 S			
25			"			
26			65702 DS			
27			"			
28			65693			
29			"			
30			65701			
31			"			
32			65703			
33			"			
34			CCV			
35			B			
36			D4			
37	10		65704			
38			"			
39			65705			
40			"			
41	10		65706			
42			"			
43			65707			
44			"			
45			65708			
46			"			
47			65709			
48			"			
49			BL1119	2NPO		
50			"			
51			BL1119 S			
52			"			
53			BL1119 DS			
54			"			
55	10		65710			
56			"			
57		MA	~~65710 B~~ CCV			
58		MA	" B			
59		MA	~~65710 S~~ D4			
60	10		65710 D			
61			65710 D			
62			65710 S			
63			"			
64			65710 DS			
65			"			
66			65711			
67			"			
68			65712			
69			"			
70			65713			
71			"			
72			65714			
73			"			
74			65715			
75			"			
76			657116			
77			"			
78			BL1118	2BHN		
79			"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99-11-19 Run Code: M601 Matrix: IMP.

Analyst: MG Units: µg (see comments) MDL: 0.01

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
81 ~~21~~			B			
22			D4			
23			BL1118 S			
24			"			
25			BL1118 DS			
26			"			
27		1/4	64891			
28	"	↓	"			
29	2/3	1/40	64670	UNDIGESTED		
30	↓	↓	"	"		
31	20	1/2	64670	DIGESTED		
32	↓	↓	"	"		
33			WS 378			
34			ORG. REF.			
35			CCV			
36			B			
37			D4			
38			BL1119	STA 1		
39			BL1119 S			
40			68663			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			68663 D			
42			63 S			
43			61			
44			61 S			
45			68806			
46			68978			
47			68813			
48			68882			
49			CCV			
50			B			
51			D4			
52						
53						
54						
55						
56						
57						
58						
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60						
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74						
75						
76						
77						
78						
79						
80						

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

µg/L

		100%
	TUG	98% 109%
65892	<0.01	
	0.100	100%
	0.101	101%
	<0.250	
	<0.250	
	2.501	100%
	2.439	97%
	<0.250	
	<0.250	
	<0.250	
		99%
	<0.250	
	<0.250	
	0.955	
	<0.250	
	<0.250	
	<0.250	
65763	NB <0.010	<0.01
	0.099	99%
	0.102	102%
	<0.250	
		99%
	<0.250	
	2.573	103%
	2.559	102%
	<0.250	

09035

	<0.250	
	<0.250	
	<0.250	
	<0.250	
-28MN.64669	<0.03	<0.01
		101%
	0.293	97%
	0.302	101%
-KMnO4	7.819	
		VOID; UNDIGESTED MT
	2.675	
		93%
		109%
		100%
		98%
		98%
		96%
		98%

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064669	EER-CA2	MB R456	Mercury -	PV	-0.030	-99999.0	0.301	101.	0.307	102.	99/11/17	2NKC	99/11/17	MG02	36.	20.	
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.100						99/11/17	2NKC	99/11/17	MG02	36.	20.	
064671	EER-CA2	FB-SI-OHM	Mercury -	PV	-0.100						99/11/17	2NKC	99/11/17	MG02	36.	20.	
064673	EER-CA2	R2-SI-OHM	Mercury -	PV	2.023	1.995	3.028	101.	3.028	101.	99/11/17	2NKC	99/11/17	MG02	35.	20.	
064674	EER-CA2	R3-SI-OHM	Mercury -	PV	2.505						99/11/17	2NKC	99/11/17	MG02	35.	20.	
064675	EER-CA2	R4-SI-OHM	Mercury -	PV	2.705						99/11/17	2NKC	99/11/17	MG02	34.	20.	
064678	EER-CA2	R2-SO-OHM	Mercury -	PV	-0.100						99/11/17	2NKC	99/11/17	MG02	35.	20.	
064679	EER-CA2	R3-SO-OHM	Mercury -	PV	0.188						99/11/17	2NKC	99/11/17	MG02	35.	20.	
064680	EER-CA2	R4-SO-OHM	Mercury -	PV	0.188						99/11/17	2NKC	99/11/17	MG02	34.	20.	
BL1117	INTERNAL		Mercury -	PV	-0.030	-99999.0	0.301	101.	0.307	102.	99/11/17	2NKC	99/11/17	MG02	$$$	$$$	

10 Tests for OHKCL with an MDL of 0.030 ug Validated By CMB Control Chart Updated N/A IO Requirements met N/A

00036

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.17 (WA Run Code: MGOU Matrix: IMP

Analyst: MG Units: µg (see comments) MDL: _____

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG. REF.			
14			BL1117	1GPR		
15			"			
16			BL1117 S			
17			"			
18			BL1117 DS			
19			"			
20			57933			
21			"			
22			57933 D			
23			"			
24			57933 S			
25			"			
26			57933 DS			
27			"			
28			57931			
29			"			
30			57932			
31			"			
32			57934			
33			"			
34			CCV			
35			B			
36			D4			
37			57935			
38			"			
39		1/5	57936			
40		↓	"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41		1/5	57937			
42		↓	"			
43			57938			
44			"			
45			57933			
46			"			
47			CCV			
48			B			
49			D4			
50			BL1117	ZNKC		
51			"			
52			BL1117 S			
53			"			
54			BL1117 DS			
55			"			
56		1/4	64673			
57		↓	"			
58			64673 D			
59			"			
60			64673 S			
61			"			
62			64673 DS			
63			"			
64			64670			
65			"			
66			64671			
67			"			
68			64674			
69			"			
70			CCV			
71			B			
72			D4			
73		1/2	64675			
74		↓	"			
75			64676			
76			"			
77			64678			
78			"			
79			64679			
80			"			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.17 (WA) Run Code: MG02 Matrix: IMP/WATER

Analyst: MG Units: µg (see comments) MDL: _____

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
21			64680			
22			"			
23			65529	1B		
24			"			
25			CCV			
26			B			
27			D4			
28			BL1117	ABAL		
29			BL1117 S			
30			67841			
31			841 D			
32			841 S			
33			67839			
34			39 S			
35			17			
36			67603			
37			05			
38			67988			
39			67757			
40			58			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			68599			
42	10	1/2	68612			
43			CCV			
44			B			
45			D4			
46			BL1117	ABAL		
47			BL1117 S			
48			67854			
49			54 D			
50			54 S			
51			55			
52			56			
53			57			
54			68589			
55			97			
56			98			
57			68087			
58			68316			
59						
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Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

EPA 7470 WATER PREPARATION LOG - MERCURY

09039 DG7470HG
DGHGLEACH, DG29HG***

Calibration Solutions:

#	I.D.	*Conc.	Spike	**Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
7	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List
- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples bulked and mixed
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	WKC	20 ml	30 ml	1 X	1.5 ppb = 600 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	10	BL 1117	"	"	"	"	(Processed Blank) 64669
	11	BL 1117 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	12	64673	"	"	"	"	mPVKCL 1000 mL
1	13	D	"	"	"	"	(Duplicate sample)
1	14	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	15	DS	"	"	"	"	(Duplicate Spiked sample)
2	16	64670	"	"	"	"	
3	17	71	"	"	"	"	
4	18	74	"	"	"	"	
5	19	75	"	"	"	"	
6	20	76	"	"	"	"	
7	21	78	"	"	"	"	
8	22	79	"	"	"	"	
9	23	80	"	"	"	"	
10	24		"	"	"	"	
	25	CCV (Cont. Calib. Verif.)		20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	26	BL	"	"	"	"	(Processed Blank)
	27	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	28		"	"	"	"	
1	29	D	"	"	"	"	(Duplicate sample)
1	30	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	31	DS	"	"	"	"	(Duplicate Spiked sample)
2	32		"	"	"	"	
3	33		"	"	"	"	
4	34		"	"	"	"	
5	35		"	"	"	"	
6	36		"	"	"	"	
7	37		"	"	"	"	
8	38		"	"	"	"	
9	39		"	"	"	"	
10	40		"	"	"	"	

Notes: Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C
DG29HGI, DG29HGF, DG101AA1, DG101AA2

Include External Reference Material (EPA WS 378 or SPEX CertiPrep TM - WS) per run

Prepare 0.05 ppm standards daily

HNO3 Lot. No. 119060	H2SO4 Lot. No. 318060	Bath Temps. 1 / 195°C

Prepared By: M Aliprepop Date: 99/1/7 Checked by: M Aliprepop

µg/L

98%

<0.0047

	0.096	96%
	0.095	95%
		VOID RERUN @ END
	0.090	
	0.188	105%
	0.199	115%
	<0.01	
	<0.01	
	<0.01	
		101%
	<0.01	
	<0.05	
	<0.05	
	<0.05	
	0.077	
		100%
64669	<0.03	
	0.301	101%
	0.307	102%
	2.023	
	1.995	
	3.028	101%
	3.028	101%
	<0.100	
	<0.100	
	2.505	
		101%
	2.705	
VOID MB	<0.100	RERUN ON NOV. 18 MB

8.788

20.03 ~~20.100~~ MS

102%

67755

100%

99%

67815, 67986

94%

103%

68085

95%

94%

95%

107%

99%

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064669	EER-CA2	MB R456	Mercury -	PV	-0.100	-99999.0	0.310	103.	0.312	104.	99/11/11	1NM4	99/11/11	MG01	30.	14.	
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.100						99/11/11	1NM4	99/11/11	MG01	30.	14.	
064671	EER-CA2	FB-SI-OHM	Mercury -	PV	-0.100						99/11/11	1NM4	99/11/11	MG01	30.	14.	
064673	EER-CA2	R2-SI-OHM	Mercury -	PV	0.138	0.142	0.772	95.	0.775	95.	99/11/11	1NM4	99/11/11	MG01	29.	14.	*PDS*
064674	EER-CA2	R3-SI-OHM	Mercury -	PV	0.298						99/11/11	1NM4	99/11/11	MG01	29.	14.	
064675	EER-CA2	R4-SI-OHM	Mercury -	PV	0.197						99/11/11	1NM4	99/11/11	MG01	28.	14.	
064676	EER-CA2	FB-SO-OHM	Mercury -	PV	0.367						99/11/11	1NM4	99/11/11	MG01	30.	14.	
064678	EER-CA2	R2-SO-OHM	Mercury -	PV	0.331						99/11/11	1NM4	99/11/11	MG01	29.	14.	
064679	EER-CA2	R3-SO-OHM	Mercury -	PV	0.784						99/11/11	1NM4	99/11/11	MG01	29.	14.	
064680	EER-CA2	R4-SO-OHM	Mercury -	PV	0.645						99/11/11	1NM4	99/11/11	MG01	28.	14.	
BL1111	INTERNAL		Mercury -	PV	-0.030	-99999.0	0.310	103.	0.312	104.	99/11/11	1NM4	99/11/11	MG01	$$$	$$$	

11 Tests for OHMN4 with an MDL of 0.030 ug Validated By CMS Control Chart Updated N/A IO Requirements met N/A

00049

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.11 Run Code: M601 Matrix: MP

Analyst: M6 Units: µg (see comments) MDL:

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.6		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.6		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.6		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG REF			
14			BL110	2N3B		
15			"			
16			BL110 S			
17			"			
18			BL110 DS			
19			"			
20		½	67363			
21			"			
22			67363 D			
23			"			
24			67363 S			
25			"			
26			67363 DS			
27			"			
28			CCV			
29			B			
30			D4			
31			BL11 11	1NM4		
32			"			
33			BL11 11 S			
34			"			
35			BL 11 11 DS			
36			"			
37	2/3		64673			
38			"			
39			64673 D			
40			"			
41	2/3		64673 S			
42			"			
43			64673 DS			
44			"			
45			64670			
46			"			
47			64671			
48			"			
49		½	64672			
50			"			
51			CCV			
52			B			
53			D4			
54	2/3		64674			
55			"			
56			64675			
57			"			
58			64676			
59			"			
60			64677			
61			"			
62			64678			
63			"			
64			64679			
65			"			
66			64680			
67			"			
68			CCV			
69			B			
70			D4			
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

[illegible] 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

00051

EPA 7470 WATER PREPARATION LOG - MERCURY

DG7470HG
DGHGLEACH, DG29HG***

Calibration Solutions:

#	I.D.	*Conc.	Spike	**Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
7	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List
- Digest Code/labels
- Samples poured out
- Acids added
- Reagents added
- Samples spiked
- Bath at 95 degrees C
- Samples digested
- Hydroxylamine HCl added
- Samples bulked and mixed
- Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	MMA	20 ml	30 ml	1 X	1.5 ppb = 600 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	10	BL " "	"	"	"	"	(Processed Blank)
	11	BL " " S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	12	64673	"	"	"	"	Volume: 1000 ml
1	13	" D	"	"	"	"	(Duplicate sample)
1	14	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	15	DS	"	"	"	"	(Duplicate Spiked sample)
2	16	64670	"	"	"	"	
3	17	71	"	"	"	"	
4	18	72	"	"	"	"	
5	19	74	"	"	"	"	
6	20	75	"	"	"	"	
7	21	76	"	"	"	"	
8	22	77	"	"	"	"	
9	23	78	"	"	"	"	
10	24	79	"	"	"	"	
	25	CCV (Cont. Calib. Verif.)		20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	26	BL	"	"	"	"	(Processed Blank)
	27	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	28		"	"	"	"	
1	29	D	"	"	"	"	(Duplicate sample)
1	30	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	31	DS	"	"	"	"	(Duplicate Spiked sample)
2	32		"	"	"	"	
3	33		"	"	"	"	
4	34		"	"	"	"	
5	35		"	"	"	"	
6	36		"	"	"	"	
7	37		"	"	"	"	
8	38		"	"	"	"	
9	39		"	"	"	"	
10	40		"	"	"	"	

Notes: Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C
DG29HGI, DG29HGF, DG101AA1, DG101AA2

Include External Reference Material (EPA WS 378 or SPEX CertiPrep TM - WS) per run

Prepare 0.05 ppm standards daily

HNO3 Lot. No. N/A | H2SO4 Lot. No. N/A | Bath Temps. N/A °C

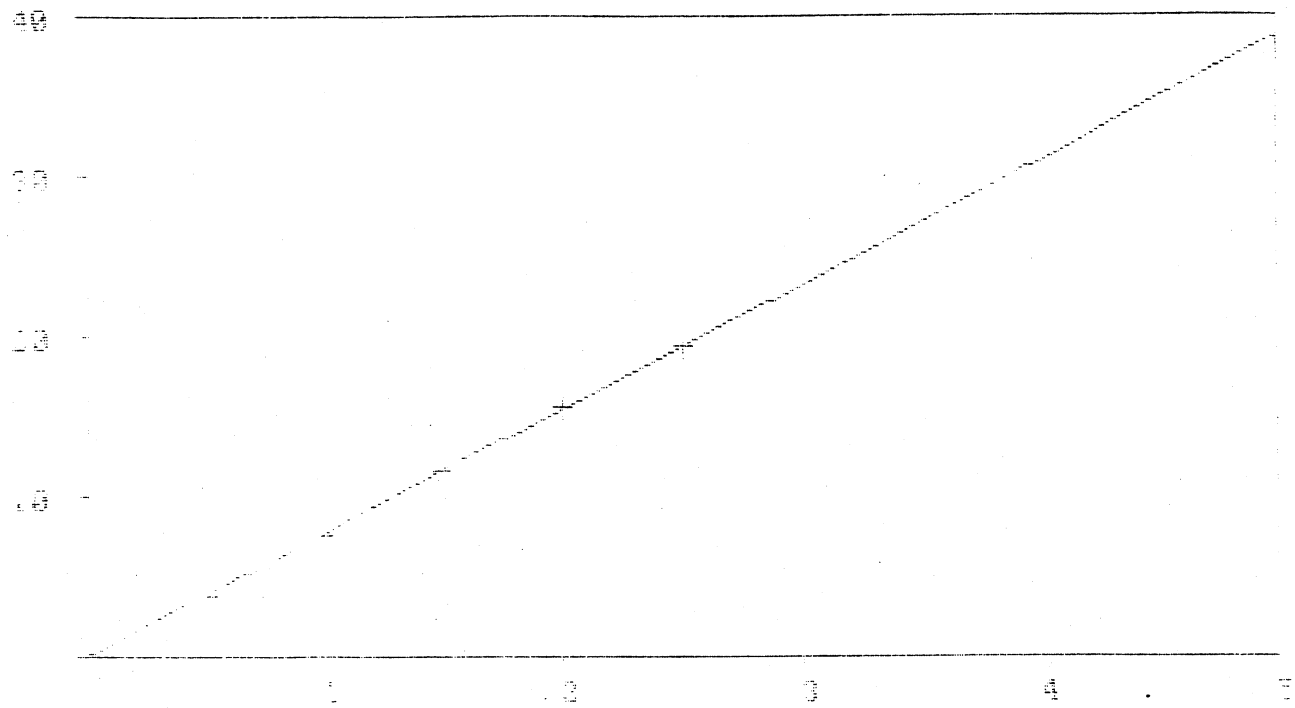
Prepared By: MN Date: 99.11.11 Checked by: MN

25	673638	2	1	5.1		1.318	
26	67363DS	2	1	5.0		1.299	
27	67363DS	2	1	5.0		1.306	
28	CCV	1	1	7.7	TMG	1.000	
29	B	1	1	0.0		0.002	b
30	D4	1	1	11.6		1.496	d
31	BL1111-1NM4	1	1	0.0	<0.03	0.002	s
32	BL1111-1NM4	1	1	0.0		0.002	I
33	BL11113	1	1	8.0	0.310	1.035	103%
34	BL11113	1	1	7.9		1.029	
35	BL11113DS	1	1	8.0	0.312	1.035	104%
36	BL11113DS	1	1	8.1		1.043	
37	64673	.6666	1	1.6	0.138	0.140	
38	64673	.6666	1	1.6		0.136	
39	64673D	.6666	1	1.7	0.142	0.144	
40	64673D	.6666	1	1.6		0.140	
41	64673S	.6666	1	8.9	0.772	0.770	95%
42	64673S	.6666	1	9.0		0.774	
43	64673DS	.6666	1	9.0	0.775	0.778	95%
44	64673DS	.6666	1	8.9		0.772	
45	64670	.6666	1	0.0	<0.100	0.001	I
46	64670	.6666	1	0.0		0.001	s
47	64671	.6666	1	0.3	<0.100	0.045	
48	64671	.6666	1	0.4		0.039	I
49	64672	1.333	1	9.2	1.590	1.590	
50	64672	1.333	1	9.2		1.590	
51	CCV	1	1	7.6		0.988	99%
52	B	1	1	0.0		0.002	b
53	D4	1	1	11.6		1.496	d
54	64674	.6666	1	3.4	0.298	0.296	
55	64674	.6666	1	3.5		0.300	
56	64675	.6666	1	2.3	0.197	0.199	
57	64675	.6666	1	2.3		0.195	
58	64676	.6666	1	4.2	0.367	0.368	
59	64676	.6666	1	4.2		0.366	
60	64677	.6666	1	3.9	0.343	0.340	
61	64677	.6666	1	4.0		0.345	c
62	64678	.6666	1	3.8	0.331	0.328	
63	64678	.6666	1	3.9		0.334	
64	64679	.6666	1	9.1	0.784	0.783	
65	64679	.6666	1	9.1		0.785	
66	64680	.6666	1	7.5	0.645	0.646	
67	64680	.6666	1	7.4		0.644	
68	CCV	1	1	7.5		0.978	98%
69	B	1	1	0.0		0.002	b
70	D4	1	1	11.6		1.496	d

INTERCEPT: -0.01 LINEAR COEF: 7.727891

CORRELATION COEF: .9999554

CHANNEL NAME: LDC
RUN NAME: 991111W



CALIBRATION ORDER: 1
SLOPE = 7.127891

CORRELATION: .99[illegible]%

CHANNEL NAME: LDC
RUN DATE: 11-11-99
CAMPAIGN NAME: 991111W
MATRIX NAME: MSWATER

ppb

CURV#	SAMPLE ID	DIL	WGT	HEIGHT/AREA	CONCENTRATION	SF
1	BLANKER	1	1	11.3	1.459	[illegible]
2	DUMMY	1	1	0.0	0.003	I
3	S1: 0.[illegible]	1	1	0.1	0.011	I
4	S2: 1.[illegible]	1	1	3.8	0.495	
5	S3: 1	1	1	7.6	0.988	
6	S4: 1.5	1	1	11.6	1.496	
7	S5: 2	1	1	15.5	2.000	
8	S6: 2.5	1	1	19.3	2.501	
9	ICV	1	1	11.0	1.430	95%
10	B		1	0.0	0.002	b
11	D4	1	1	11.6	1.496	d
12	WS 373	1	1	15.4	1.993	100%
13	ORG REC	1	1	17.5	2.264	113%
14	BL1110-2N33	1	1	0.0	0.002	I
15	BL1110-2N36	1	1	0.0	0.002	I
16	BL111006	1	1	7.9	1.026	s
17	BL111006	1	1	7.9	1.026	
18	BL111006	1	1	9.0	1.168	
19	BL111006	1	1	7.7	1.004	
20	67363	1	1	1.1	0.275	
21	67363	1	1	1.1	0.288	
22	[illegible]	1	1	1.0	0.269	

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064701	EER-CA2	Blank Batch B	Mercury -	PV	-0.050	-0.050	0.509	101.	0.504	101.	99/11/18	3BMN	99/11/18	MG03	37.	21.	
064702	EER-CA2	Blank Batch #1	Mercury -	PV	-0.050						99/11/18	3BMN	99/11/18	MG03	36.	21.	
064703	EER-CA2	Blank Batch #2	Mercury -	PV	-0.050						99/11/18	3BMN	99/11/18	MG03	36.	21.	
064705	EER-CA2	Batch Blank 991014	Mercury -	PV	-0.050						99/11/18	3BMN	99/11/18	MG03	36.	21.	
BL1118	INTERNAL		Mercury -	PV	-0.030	-99999.0	0.303	101.	0.300	100.	99/11/18	3BMN	99/11/18	MG03	$$$	$$$	

5 Tests for OHMN4 with an MDL of 0.030 ug Validated By CMS Control Chart Updated N/A IO Requirements met N/A

03058

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064676	EER-CA2	FB-SO-OHM	Mercury -	PV	-0.100						99/11/17	2NKC	99/11/18	MG03	36.	20.	

1 Tests for OHKCL with an MDL of 0.030 ug Validated By CMS Control Chart Updated N/A IO Requirements met N/A

00059

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.18(WA) Run Code: MG03 Matrix: TMP.

Analyst: MG Units: µg (see comments) MDL: 0.03

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG REF.			
14			BL1118	INKC.		
15			"			
16			BL1118 S			
17			"			
18			BL1118 DS			
19			"			
20			64883			
21			"			
22			64883 D			
23			"			
24			64883 S			
25			"			
26			64883 DS			
27			"			
28			64881			
29			"			
30			64882			
31			"			
32		1/4	64884			
33		↓	"			
34			CCV			
35			B			
36			D4			
37		1/2	64885			
38		↓	"			
39		1/4	64886			
40		↓	"			
41			64887			
42			"			
43			64888			
44			"			
45			64889			
46			"			
47			64890			
48			"			
49			BL1118	2NKC		
50			"			
51			BL1118 S			
52			"			
53			BL1118 DS			
54			"			
55			64894			
56			"			
57			~~[illegible]~~ CCV			
58			B			
59			D4			
60			64894 D			
61			"			
62			64894 S			
63			"			
64			64894 DS			
65			"			
66			64891			
67			"			
68			64892			
69			"			
70			64893			
71			"			
72			64895			
73			"			
74			64896			
75			"			
76			64897			
77			"			
78			64898			
79			"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.18 (WA) Run Code: MG03 Matrix: IMP.

Analyst: MG Units: µg (see comments) MDL: 0.03

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
21			B			
22			D4			
23			64899			
24			"			
25			64900			
26			"			
27			64676	KCl/HD.		
28			"			
29			64679	KCl/D		
30			"			
31			BL1118	1BMN		
32			"			
33			BL1118 S			
34			"			
35			BL1118 DS			
36			"			
37		1/8	64883			
38			"			
39			64883 D			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41		1/8	64883 S			
42			"			
43			CCV			
44			B			
45			D4			
46		1/8	64883 DS			
47			"			
48			64881			
49			"			
50			64882			
51			"			
52		1/8	64884			
53			"			
54			64885			
55			"			
56			64886			
57			"			
58			64887			
59			"			
60		1/5	64888			
61			"			
62		1/4	64889			
63			"			
64			64890			
65			"			
66			CCV			
67			B			
68			D4			
69			BL1118	2BMN		
70			"			
71			BL1118 S			
72			"			
73			BL1118 DS			
74			"			
75			64894			
76			"			
77			64894 D			
78			"			
79			64894 S			
80			"			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.18(WA) Run Code: MG03 Matrix: IMP./WATER

Analyst: MG Units: µg (see comments) MDL: 0.03

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
41 ~~21~~			64894 DS			
22			"			
23			64891			
24			"			
25			64892			
26			"			
27			64893			
28			"			
29			CCV			
30			B			
31			D4			
32		1/5	64895			
33		↓	"			
34			64896			
35		↓	"			
36			64897			
37			"			
38		1/4	64898			
39		↓	"			
40		↓	64899			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41		1/4	64899			
42		↓	64900			
43		↓	"			
44			BL1118	3BMN		
45			"			
46			BL1118 S			
47			"			
48			BL1118 DS			
49			"			
50			64701			
51			"			
52			CCV			
53			B			
54			D4			
55			64701 D			
56			"			
57			64701 S			
58			"			
59			64701 DS			
60			"			
61			64702			
62			"			
63			64703			
64			"			
65			64705			
66			"			
67			BL1118	1BHY		
68			"			
69			BL1118 S			
70			"			
71			BL1118 DS			
72			"			
73	1.5		64670			
74			"			
75			CCV			
76			B			
77			D4			
78	1.5		64881			
79	↓		"			
80	↓		64892			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.18 (WA) Run Code: M603 Matrix: IMP. /WATER

Analyst: MG Units: ~~µg~~ (see comments) MDL: _____

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
21	1.5		64892			
22			65554			
23			"			
24			65764			
25			"			
26			65693			
27			"			
28	"		CCV			
29			B			
30			D4			
31			BL1118	STBL		
32			BL1118 S			
33			68153			
34			53 D			
35			53 S			
36			51			
37			51 S			
38			68003			
39			020			
40			319			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			68324			
42			26			
43			28			
44			30			
45			32			
46			CCV			
47			B			
48			D4			
49			BL1118	STBL		
50			BL1118 S			
51			68318			
52			18 D			
53			18 S			
54			68871			
55			872			
56			WS 378			
57			ORG. REF			
58			CCV			
59			B			
60			D4			
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	41	CCV (Cont. Calib. Verif.)	38 MN	20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	42	BL 1118	"	"	"	"	(Processed Blank)
	43	BL 1118 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	44	64701	"	"	"	"	FV=500ml
1	45	D	"	"	"	"	(Duplicate sample)
1	46	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	47	DS	"	"	"	"	(Duplicate Spiked sample)
2	48	64702	"	"	"	"	
3	49	703	"	"	"	"	
4	50	705	"	"	"	"	
5	51		"	"	"	"	
6	52		"	"	"	"	
7	53		"	"	"	"	
8	54		"	"	"	"	
9	55		"	"	"	"	
10	56		"	"	"	"	

Comments

* concentration based on 30 ml final volume, ** concentration based on 20 ml final volume

*** group of several Method 29 testcodes

Dilution factor of 1.5 is corrected by entering the calibration concentrations listed above

Procedure/Methodology:

1 Prepare 25 ppm Intermediate stock (if required) by pipetting 625 ul., of 1000 ppm Stock to 25 ml final volume of 2% HNO3
2 Prepare 0.05 ppm Working stock daily by pipetting 200 ul., of 25 ppm Stock to 100 ml final volume of 2% HNO3
3 Using the LIMS Screen "SCNDIG" enter the required samples into LIMS
4 Using the labeling program, "DIGLBL", retreive the "SCNDIG" list and create labels for the required samples.
5 Label the falcon tubes appropriately
6 Transfer a 20 ml. aliquot of well mixed sample into the designated falcon tube
7 Spike the tubes as indicated in the comment sector of the digestion sheet
8 Add 0.5 ml. of conc. Nitric Acid (HNO3), and 1 ml. of conc. Sulphuric acid, (H2SO4), to each tube
9 Add 3 ml. Potassium Permanganate (KMnO4), colour should remain for at least 15 minutes
10 Add 1.5 ml. of Potassium persulphate, (K2S2O8), to each tube
11 Mix samples, cap loosely and place in a water bath @ 95 degrees C for 2 hours
12 Remove tubes and allow to cool to room temperature
13 Add 1.0 ml. 20% Hydroxylamine Hydrochloride to each tube
14 Recap tubes and shake until the Potassium Permanganate (KMnO4) is destroyed and sample becomes colourless
15 Dilute the sample to a final volume of 30 ml., cap and mix well

REFERENCE STANDARDS/SPIKING SOLUTIONS:
Source: Inorganic Ventures Standard, see standard tracking binder for current lot and expiry date information

ICV/CCV STANDARDS:
Source: High Purity MESS-ZENO 30/QCA Standard, see standard tracking binder for current lot

INTERNAL REFERENCE STANDARD: (2 ppb in 10% HNO3)
Source: EPA WS 378 or SPEX CertiPrep Trace Metal - Water Supply, see standard tracking binder for current source, lot and expiry date information.

All reagents used are of a grade suitable for mercury analyses

EPA 7470 WATER PREPARATION LOG - MERCURY

09065 DG7470HG
DGHGLEACH, DG29HG***

Calibration Solutions:

#	I.D.	*Conc.	Spike	**Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
7	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List
- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples bulked and mixed
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	1N KC	20 ml	30 ml	1 X	1.5 ppb = 600 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	10	BL 1118	"	"	"	"	(Processed Blank) 67880 MB
	11	BL 1118 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	12	64881	"	"	"	"	IMPV KCL 1000 mL
1	13	D	"	"	"	"	(Duplicate sample)
1	14	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	15	DS	"	"	"	"	(Duplicate Spiked sample)
2	16	64882	"	"	"	"	
3	17	83	"	"	"	"	FULL QC
4	18	84	"	"	"	"	
5	19	85	"	"	"	"	
6	20	86	"	"	"	"	
7	21	87	"	"	"	"	
8	22	88	"	"	"	"	
9	23	89	"	"	"	"	
10	24	90	"	"	"	"	
	25	CCV (Cont. Calib. Verif.)	2N KC	20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	26	BL 1118	"	"	"	"	(Processed Blank)
	27	BL 1118 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	28	64891	"	"	"	"	IMPV KCL 1000 mL
1	29	D	"	"	"	"	(Duplicate sample)
1	30	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	31	DS	"	"	"	"	(Duplicate Spiked sample)
2	32	92	"	"	"	"	
3	33	93	"	"	"	"	
4	34	94	"	"	"	"	FULL QC
5	35	95	"	"	"	"	
6	36	96	"	"	"	"	
7	37	97	"	"	"	"	
8	38	98	"	"	"	"	
9	39	99	"	"	"	"	
10	40	64900	"	"	"	"	

Notes: Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C
DG29HGI, DG29HGF, DG101AA1, DG101AA2

Include External Reference Material (EPA WS 378 or SPEX CertiPrep TM - WS) per run

Prepare 0.05 ppm standards daily

HNO3 Lot. No. 119060 | H2SO4 Lot. No. 38060 | Bath Temps. 1 195 °C

Prepared By: [illegible] Date: 99 11 18 Checked by: [illegible]

µg/L

		98%
		92%
	TUG	113%
64880	<0.03	
	0.298	99%
	0.303	101%
	0.981	
	1.057	

2.047	103%
<0.100	
<0.100	
4.568	
	99%
3.097	
4.481	
<0.100	
0.991	
0.405	
0.170	
<0.03	
0.298	99%
0.300	100%
0.249	
	101%
0.259	
1.292	103%
1.283	103%
<0.100	
<0.100	
<0.100	
0.590	
0.465	
<0.100	
0.115	
	101%
<0.100	
<0.100	
<0.100	

64880

00075

<0.03	
0.305	101%
0.304	101%
8.908	
9.244	
10.050	97%
	101%
9.996	91%
<0.100	
<0.100	
10.600	
11.796	
10.560	
<0.100	
9.446	
6.757	
8.330	
	100%
<0.03	
MS 0.285	98%
0.303	101%
0.706	
0.666	
1.721	103%
1.690	100%
	VOID; RERUN ON 4x DIL
<0.100	
0.182	
	100%
9.563	
10.151	

	4.8306	
	5.918	
	6.724	
	<0.03	
	0.303	101%
	0.300	100%
	<0.05	
		101%
	<0.05	
	0.509	101%
	0.504	101%
	<0.05	
	<0.05	
	<0.05	
64880 65692. 65763. 65836, 66553	<0.01	
	0.096	96%
	0.094	94%
		107%
	<0.01	
	<0.01	
	<0.01	
	0.022	
	0.024	
		96%
		100%
		101%
61993, 68009, 68310		101%

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
064669	EER-CA2	MB R456	Mercury -	PV	-0.0100	-99999.0	0.1020	102.	0.1030	103.	99/11/10	1NPO	99/11/10	MG02	29.	13.	*BLKIMP*
064670	EER-CA2	Reagent Blank OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	29.	13.	*DDL*
064671	EER-CA2	FB-SI-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	29.	13.	*DDL*
064673	EER-CA2	R2-SI-OHM	Mercury -	PV	-0.2500	-0.2500	2.4080	96.	2.4190	97.	99/11/10	1NPO	99/11/10	MG02	28.	13.	*DDL*
064674	EER-CA2	R3-SI-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	28.	13.	*DDL*
064675	EER-CA2	R4-SI-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	27.	13.	*DDL*
064676	EER-CA2	FB-SO-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	29.	13.	*DDL*
064678	EER-CA2	R2-SO-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	28.	13.	*DDL*
064679	EER-CA2	R3-SO-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	28.	13.	*DDL*
064680	EER-CA2	R4-SO-OHM	Mercury -	PV	-0.2500						99/11/10	1NPO	99/11/10	MG02	27.	13.	*DDL*
BL1110	INTERNAL		Mercury -	PV	-0.0100	-99999.0	0.1020	102.	0.1030	103.	99/11/10	1NPO	99/11/10	MG02	$$$	$$$	*BLKIMP*

11 Tests for OHPOX with an MDL of 0.010 ug Validated By CMB Control Chart Updated N/A IO Requirements met N/A

00077

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 99.11.10 Run Code: M602 Matrix: IMP.

Analyst: MG Units: µg (see comments) MDL: _____

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG. REF.			
14			BL1110	INPO		
15			"			
16			BL1110 S			
17			"			
18			BL1110 DS			
19			"			
20	10		64673			
21			"			
22			64673 D			
23			"			
24			64673 S			
25			"			
26			64673 DS			
27			"			
28			64670			
29			"			
30			64671			
31			"			
32			~~64673~~ MS			
33			"			
34			CCV			
35			B			
36			D4			
37	10		64674			
38			"			
39			64675			
40			"			
41	10		64676			
42			"			
43			64678			
44			"			
45			64679			
46			"			
47			64680			
48			"			
49			BL1110	2N3B		
50			"			
51			BL1110 S			
52			"			
53			BL1110 DS			
54			"			
55			65282			
56			"			
57		MS	~~65282 D~~ CCV			
58			B			
59			D4			
60			65282 D			
61			"			
62			65282 S			
63			"			
64			65282 DS			
65			"			
66			65281			
67			"			
68		1/20	65283			
69		↓	"			
70			65284			
71			"			
72			65285			
73			"			
74			67362			
75			"			
76			67363			
77			"			
78			67363 D			
79			"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

EPA 7470 WATER PREPARATION LOG - MERCURY

~~00079~~ DG7470HG
DGHGLEACH, DG29HG***

Calibration Solutions:

#	I.D.	*Conc.	Spike	**Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
7	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List
- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples bulked and mixed
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	INPO	20 ml	30 ml	1 X	1.5 ppb = 600 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	10	BL 1110	"	"	"	"	(Processed Blank)
	11	BL 1110 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	12	64673	"	1 ml	15 ml	10X	= FV POX 250 ml
1	13	D	"	↓	↓	↓	(Duplicate sample)
1	14	S	"	↓	↓	↓	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	15	DS	"	↓	↓	↓	(Duplicate Spiked sample)
2	16	64670	"	↓	↓	↓	
3	17	71	"	↓	↓	↓	
4	18	74	"	↓	↓	↓	
5	19	75	"	↓	↓	↓	
6	20	76	"	↓	↓	↓	
7	21	78	"	↓	↓	↓	
8	22	79	"	↓	↓	↓	
9	23	80	"	↓	↓	↓	
10	24		"	↓	↓	↓	
	25	CCV (Cont. Calib. Verif.)	2N3B	20 ml	30 ml	1 X	1.0 ppb = 400 ul. of 0.05 ppm HP MESS-ZENO 30/QCA Std.
	26	BL 1110	"	"	"	"	(Processed Blank)
	27	BL 1110 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	28	65082	"	"	"	"	= FV 3B 500 mL
1	29	D	"	"	"	"	(Duplicate sample)
1	30	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm Inorganic Ventures Std Interm.
1	31	DS	"	"	"	"	(Duplicate Spiked sample)
2	32	65281/67361	"	"	"	"	
3	33	65283	"	"	"	"	
4	34	84	"	"	"	"	
5	35	85	"	"	"	"	
6	36	67362	"	"	"	"	
7	37	63	"	"	"	"	FULL QC
8	38	64	"	"	"	"	
9	39	65	"	"	"	"	
10	40		"	"	"	"	

Notes: Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C
DG29HGI, DG29HGF, DG101AA1, DG101AA2

Include External Reference Material (EPA WS 378 or SPEX CertiPrep TM - WS) per run

Prepare 0.05 ppm standards daily

HNO3 Lot. No. 117060	H2SO4 Lot. No. 318060	Bath Temps. 1 195°C

Prepared By: M Thiaperop Date: ~~9410~~ 941110 Checked by: M Thiaperop

		PPb	
			99%
	TLLG		101%
			113%
64469	<0.01		
	0.102		102%
	0.103		103%
	<0.250		
	<0.250		
	2.408		96%
	2.419		97%
	<0.250		
	<0.250		
			97%
	<0.250		
	<0.250		
	<0.250		
	<0.250		
	<0.250		

65281, 67361

(CUP SKIPPED)

<0.05

05086

VOID MB

0.532 106%

0.528 105%

0.328

101%

0.328

0.858 105%

0.846 103%

<0.05

15.634

0.657

<0.05

<0.05

0.091 RERUN ON 2x Dil.

0.089

102%

0.441 70% *INTERFERENCE* REFER TO CHART.

0.443 71%

2.876

0.400

65971

<0.05

0.536 107%

0.533 107%

2.913

2.894

3.315 82%

100%

3.342 88%

Dil. check 3% RPD

<0.05

4.468

4. SHIPPING/RECEIVING DOCUMENTS

Airbills (No. of shipments)
Chain-of-Custody Records
Sample Log-In Sheets
Miscellaneous Shipping/Receiving Records (describe or list)
Jay notification

52

FedEx USA Airbill FedEx Tracking Number 8116 8126 2529

Form I.D. No. 0215

1 From Information

Date

FedEx Tracking Number 811681262529

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible] Dept./Floor/Suite/Room

City [illegible] State [illegible] ZIP [illegible]

2 Your Internal Billing Reference [illegible]

3 To Recipient's Name Bob McLeod Phone 905 332-[illegible]

Company Phyto Analytical Services

Address 229 Cayuga Rd.

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

To "HOLD" at FedEx location, print FedEx address here.

City Cheektowaga State NY ZIP 14225

8116 8126 2529

0095726564

4a *Packages up to 150 lbs.* Delivery commitment may be later in some areas

- [x] FedEx Priority Overnight — Next business morning
- [ ] FedEx Standard Overnight — Next business afternoon
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations
- [ ] FedEx 2Day* — Second business day
- [ ] FedEx Express Saver* — Third business day

* FedEx Letter Rate not available. †Minimum charge: One pound rate

4b *Packages over 150 lbs.* Delivery commitment may be later in some areas

- [ ] FedEx 1Day Freight* — Next business day
- [ ] FedEx 2Day Freight — Second business day
- [ ] FedEx 3Day Freight — Third business day

* Call for Confirmation

5

- [ ] FedEx Letter*
- [ ] FedEx Pak*
- [x] Other Pkg. — Includes FedEx Box, FedEx Tube, and customer pkg.

* Declared value limit $500

6

- [ ] **Saturday Delivery** — Available for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
- [ ] **Sunday Delivery** — Available for FedEx Priority Overnight to select ZIP codes
- [ ] **HOLD Weekday at FedEx Location** — Not available with FedEx First Overnight
- [ ] **HOLD Saturday at FedEx Location** — Available for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods?

- [x] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous Goods cannot be shipped in FedEx packaging.

7 *Bill to:*

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages	Total Weight	Total Charges
1	8 lb	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Signature Sign to authorize delivery without obtaining signature.

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Call 1·800·Go·FedEx (800 463 3339)

Visit our Web site at www.fedex.com

SNF 209 • Rev. Date 11/90 • Part #15480 © 1990 FedEx • PRINTED IN U.S.A.

359

88000

FedEx 10388804 Dangerous Goods Airbill — Sender's Copy

RETAIN FOR 1 YEAR — COPY FOR YOUR RECORDS

The World On Time

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss, including intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed amount documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid.

See the *FedEx Service Guide* for further details.

Questions? Call 1•800•Go•FedEx (800-463-3339) or Visit our Web site at www.fedex.com

1 From *Please print and press hard*

Date 10-22-99 — Sender's FedEx Account Number 1227-6640-3

Sender's Name: Tom McGrath — Phone (949) 552-1803

Company: ENERGY ENVIRONMENTAL RESEARCH

Address: 8001 IRVINE BLVD — Dept./Floor/Suite/Room

City: IRVINE — State: CA — ZIP: 92618

2 Your Internal Billing Reference (First 24 characters will appear on invoice): 3749-040

3 To

Recipient's Name: Ron McLeod — Phone (905) 332-8788

Company: Phylip Analytical Services

Address: 299 Cayuga Rd. — Dept./Floor/Suite/Room

City: Cheektowaga — State: NY — ZIP: 14225

For HLD at FedEx Location check here: ☐ Hold Weekday ☐ Hold

For Delivery check here: ☐ Saturday Delivery ☐ Sunday Delivery (Available for FedEx Priority Overnight to select ZIP codes)

4a Express Package Service *Packages up to 150 lbs* — Delivery commitment may be later in some areas

☒ FedEx Priority Overnight ☐ FedEx Standard Overnight ☐ FedEx 2Day ☐ FedEx Express Saver

4b Express Freight Service *Packages over 150 lbs* — Delivery commitment may be later in some areas

☐ FedEx 1Day Freight ☐ FedEx 2Day Freight ☐ FedEx 3Day Freight

5 Packaging

☒ Other Packaging

Dangerous Goods cannot be shipped in FedEx packaging

6 Special Handling

☒ Dangerous Goods as per attached Shipper's Declaration ☐ Cargo Aircraft Only

7 Payment

Bill to: ☒ Sender (Acct. No. in Section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Enter FedEx Acct. No. or Credit Card No. below

FedEx Account No.

Credit Card No. — Exp. Date

Total Packages	Total Weight	Total Declared Value*
2	25	$ 20,000.00

*When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for details.

FedEx Use Only

Signature Release Unavailable

PART #154827 • Rev. Date 11/98 ©1994-99 FedEx • PRINTED IN U.S.A.

FedEx Tracking Number: 813350197673 0204 — Form ID No. 374

Page 1 of 1 Pages

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable): ~~PASSENGER AND CARGO AIRCRAFT~~ / CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination

Shipment type: (delete non-applicable) NON-RADIOACTIVE / ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or I.D. No.	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr.	Authorization
Hydrogen peroxide, aqueous solution	5.1	UN2014	II	8	2 Fibreboard box x ~~0.625L~~ 2.5QL	506	

Additional Handling Information

Prepared for AIR TRANSPORT according to: (Customer MUST check one) ☐ 49 CFR ☒ ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Emergency Telephone Number (Required for U.S. Domestic Shipments): Chem Trac (800) 424-9300

Name/Title of Signatory: Dave Ladd, Technician

Place and Date: 8001 Irvine Blvd. / Irvine, CA

Signature (see warning above): 10-25-99

ACCEPTABLE FOR PASSENGER AIRCRAFT. THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT

Fed Dangerous Goods Airbill

Recipient's Copy

1 From

Date

Sender's FedEx Account Number [redacted]

Sender's Name

Phone

Company

Address

City State ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name

Phone

Company

Address

City State ZIP

For HOLD at FedEx Location check here

Hold Weekday Hold Saturday Saturday Delivery Sunday Delivery

4a Express Package Service *Packages up to 150 lbs.*

FedEx

FedEx

4b Express Freight Service *Packages over 150 lbs.*

FedEx

813350197662

Questions? Call 1•800•Go•FedEx (800-463-3339) or Visit our Web site at www.fedex.com

5 Packaging

☒ Other Packaging

Dangerous Goods cannot be shipped in FedEx packaging

6 Special Handling

☒ Dangerous Goods as per attached Shipper's Declaration

Cargo Aircraft Only

7 Payment

Bill to: Sender Recipient Third Party Credit Card Cash/Check

[redacted]

Total Packages	Total Weight	Total Declared Value	Total Charges
		$ .00	

CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY SERVICE

Signature Release Unavailable

37L

813350197662 0204

Page 1 of 1 Pages

Two completed and signed copies of this Declaration must be handed to the operator.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT

CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be breach of the applicable law, subject to legal penalties. This Declaration must not, in a circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA car agent.

Shipment type: *delete non-applicable*

NON-RADIOACTIVE / RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or I.D. No.	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr.	Authorization

Additional Handling Information

Prepared for AIR TRANSPORT according to: (Customer MUST check one)

49 CFR ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Place and Date of Signature

Emergency Telephone

Signature

IF ACCEPTABLE FOR PASSENGER AIRCRAFT THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

FedEx 10299324 Dangerous Goods Airbill 03091

The World On Time

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed a documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid.

See the *FedEx Service Guide* for further details.

Questions? Call 1•800•Go•FedEx (800-463-3339) or
Visit our Web site at www.fedex.com

1 From *Please print and press hard.*

Date 10-22-99 Sender's FedEx Account Number 1227-5640-3

Sender's Name Tom McGrath Phone (949) 552-1803

Company ENERGY ENVIRONMENTAL RESEARCH

Address 8001 IRVINE BLVD

Dept./Floor/Suite/Room

City IRVINE State CA ZIP 92618

2 Your Internal Billing Reference 3749-040

3 To

Recipient's Name Ron McLeod Phone (905) 332-8788

Company Phylip Analytical Services

Address 299 Cayuga Rd.

Dept./Floor/Suite/Room

City Cheektowaga State NY ZIP 14225

For at FedEx Location check here — Hold Weekday — Hold

For check here — Saturday Delivery — Sunday Delivery

4a Express Package Service *Packages up to 150 lbs* — FedEx Priority Overnight — FedEx Standard Overnight — FedEx 2Day — FedEx Express Saver

4b Express Freight Service *Packages over 150 lbs* — FedEx 1Day Freight — FedEx 2Day Freight — FedEx 3Day Freight

5 Packaging

☒ Other Packaging

Dangerous Goods cannot be shipped in FedEx packaging

6 Special Handling

☒ Dangerous Goods as per attached Shipper's Declaration — Cargo Aircraft Only

7 Payment

Bill to: ☒ Sender — Recipient — Third Party — Credit Card — Cash/Check

FedEx Account No

Credit Card No Exp. Date

Total Packages	Total Weight	Total Declared Value
		$ .00

FedEx Use Only

Signature Release Unavailable

374

FedEx Tracking Number 813350197684 Form ID No. 0204

Page 1 of 1 Pages

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable): ~~PASSENGER AND CARGO AIRCRAFT~~ CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination

Shipment type: (delete non-applicable) NON-RADIOACTIVE ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or ID No	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr.	Authorization
Oxidizing liquid, corrosive, n.o.8. (Potassium Permanganate) (Nitric Acid <1%) (Hydroxylamine Sulphate)	5.1	UN3098	II	8	7 Fibreboard boxes x 2L	506	

Additional Handling Information

Prepared for AIR TRANSPORT according to: (Customer MUST check one) — 49 CFR — ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Emergency Telephone Number: Chem Trac (800) 424-9300

Name/Title of Signatory: Dave Ladd, Technician

Place and Date: 8001 Irvine Blvd., Irvine, CA

Signature (see warning above): 10-25-99

IF ACCEPTABLE FOR PASSENGER AIRCRAFT THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT

Fed Dangerous Goods Airbill

00092

813350197695

Questions? Call 1•800•Go•FedEx (800-463-3339) or
Visit our Web site at www.fedex.com

1 From

Date _____ Sender's FedEx Account Number [redacted]

Sender's Name _____ Phone _____

Company _____

Address _____

City _____ State _____ ZIP _____

2 Your Internal Billing Reference _____

3 To

Recipient's Name _____

Company _____

Address _____

City _____

For HOLD at FedEx Location check here

___ Hold Weekday ___ Hold Saturday ☐ Saturday Delivery ☐ Sunday Delivery

4a Express Package Service *Packages up to 150 lbs*

___ FedEx Priority Overnight ___ FedEx Standard Overnight

___ FedEx 2Day ___ FedEx Express Saver

4b Express Freight Service *Packages over 150 lbs*

___ FedEx 1Day Freight ___ FedEx 2Day Freight

___ FedEx Priority Overnight ___ FedEx Standard Overnight

5 Packaging

☒ Other Packaging

Dangerous Goods cannot be shipped in FedEx envelopes or pouches

6 Special Handling

☒ Dangerous Goods as per attached Shipper's Declaration ___ Other

7 Payment

Bill to: ☒ Sender ___ Recipient ___ Third Party ___ Credit Card ___ Cash

[redacted]

Total Packages	Total Weight	Total Declared Value	Total Charges
		$ .00	

CONDITIONS DECLARED VALUE AND LIMIT OF LIABILITY SERVICE

Signature Release Unavailable

37L

813350197695 0204

Page 1 of 1 Pages

Two completed and signed copies of this Declaration must be handed to the operator.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT — CARGO AIRCRAFT ONLY

Airport of Departure: _____

Airport of Destination: _____

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be breach of the applicable law, subject to legal penalties. This Declaration must not, in a circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA car agent.

Shipment type: (delete non-applicable)

NON-RADIOACTIVE RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or I.D. No.	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr.	Authorization

Additional Handling Information

Prepared for AIR TRANSPORT according to (Customer MUST check one)

___ 49 CFR ___ ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Emergency Telephone Number _____

Name/Title of Signatory _____

Place and Date _____

Signature _____

IF ACCEPTABLE FOR PASSENGER AIRCRAFT THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

FedEx *Dangerous Goods Airbill* Recipient's Copy

0019

813350197798

Questions? Call 1•800•Go•FedEx (800-463-3339) or
Visit our Web site at www.fedex.com

1 From: [redacted]

2

3 To

For HOLD at FedEx Location check here
Hold Weekday Hold Saturday

☐ Saturday Delivery ☐ Sunday Delivery

4a Express Package Service

4b Express Freight Service

5 Packaging

☒ Other Packaging
Dangerous Goods cannot be shipped in FedEx packaging

6 Special Handling

☒ Dangerous Goods as per attached Shipper's Declaration ☐ Cargo Aircraft Only

7 Payment

Bill to: ☒ Sender ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

[redacted]

Total Packages	Total Weight	Total Declared Value	Total Charges
		$ .00	

CONDITIONS DECLARED VALUE AND LIMIT OF LIABILITY SERVICE Credit Card A

Signature Release Unavailable

374

FedEx Track Number 813350197798 0204

Page of Pages

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be breach of the applicable law, subject to legal penalties. This Declaration must not, in a circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA car agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable)
PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination

Shipment type: *(delete non-applicable)*
NON-RADIOACTIVE RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or I.D. No.	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr	Authorization

Additional Handling Information

Prepared for AIR TRANSPORT according to (Customer MUST check one)
☐ 49 CFR ☒ ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory
Place and Date
Signature (see warning above)

IF ACCEPTABLE FOR PASSENGER AIRCRAFT THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

Fed Ex

Dangerous Goods Airbill

Recipient's Copy

1 From

Date

Sender's FedEx Account Number

Sender's Name

Phone

Company

Address

City

State

ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name

Phone

Company

Address

City

For HOLD at FedEx Location check here

Hold Weekday

Hold Saturday

Saturday Delivery

Sunday Delivery

4a Express Package Service *Packages up to 150 lbs.*

FedEx Priority Overnight

FedEx Standard Overnight

FedEx 2Day

FedEx Express Saver

4b Express Freight Service *Packages over 150 lbs.*

FedEx 1Day Freight

FedEx 2Day Freight

FedEx Express Saver Freight

813350197813

Questions? Call 1•800•Go•FedEx (800-463-3339) or

Visit our Web site at www.fedex.com

5 Packaging

☒ Other Packaging

Dangerous Goods cannot be shipped in FedEx packaging

6 Special Handling

☒ Dangerous Goods as per Shipper's Declaration

Dry Ice

7 Payment

Bill to: Sender Recipient Third Party Credit Card

Total Packages | Total Weight | Total Declared Value $ .00 | Total Charges

CONDITIONS DECLARED VALUE AND LIMIT OF LIABILITY SERVICE Credit Card

Signature Release Unavailable

Express Package Number

Express Tracking No.

371

813350197813 0204

Page 1 of 1 Pages

Two completed and signed copies of this Declaration must be handed to the operator.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT

CARGO AIRCRAFT ONLY

Airport of Departure

Airport of Destination

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be a breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

Shipment type: *delete non-applicable*

NON-RADIOACTIVE RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or I.D. No.	Packing Group	Subsidiary Risk	Quantity and Type of Packaging	Packing Instr.	Authorization

Additional Handling Information

Prepared for AIR TRANSPORT according to (Customer MUST check one)

49 CFR ICAO / IATA

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory

Place and Date

Signature

Emergency Telephone

IF ACCEPTABLE FOR PASSENGER AIRCRAFT THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.

Page ___ of ___

US SAMPLE LOG IN SHEET

ENERGY ENOW

Lab Name: Philip Analytical Services Corporation, Burlington Laboratory

Received By (Print Name): K. Carano

Received By (Signature):

Client Project ID:

REMARKS:	Condition of Samples/Sample Shipment:
Custody Seal(s) Present ___ Absent ✓	813350197684
Chain of Custody Records Present ✓ Absent ___	Fed 8118 2367 9230 FedEx Tracking Number for Customer
Airbill Present ___ Absent ___	Fed 8118 2367 9241
Airbill No. 5[illegible] 8126 2529	Fed 8118 2367 9068
813350197662	Fed 8118 2367 9219
Fed 8118 2367 9160	Fed 8118 2367 9079
813350197695	Fed 8118 2367 9252
Fed 8118 2367 9116	Fed 8118 2367 9220 FedEx Tracking Number for Customer
Does Information on Custody Records and Samples Agree? Yes ✓ No ___	813350197695
Date Received at Lab 26-10-99	Fed 8118 2367 9013
Time Received 2:30p	Fed 8118 2367 9024
	Fed 8118 2367 9035 FedEx Tracking Number for Customer
	rec'd intact

Temperature of Coolers

Cooler ID:	Temperature
17 Boxes	not taken

Relinquished By: [illegible]

Date: [illegible]

Logbook No: ___

Logbook Page No. ___

Page ___ of ___

US SAMPLE LOG IN SHEET

ENERGY ENV

Lab Name: Philip Analytical Services Corporation, Burlington Laboratory

Received By (Print Name): K. Calcuro

Received By (Signature):

Client Project ID:

REMARKS:		Condition of Samples/Sample Shipment:
Custody Seal(s)	Present ___ Absent ✓	
Chain of Custody Records	Present ✓ Absent ___	
Airbill	Present ✓ Absent ___	
Airbill No.	8133501977 98	
Does information on Custody Records and Samples Agree?	Yes ✓ No ___	
Date Received at Lab	27-10-99	
Time Received	12:30p	

Temperature of Coolers	
Cooler ID:	Temperature
1 Box	not taken

Relinquished By: [signature]

Date: 27-10-99

Logbook No: ___

Logbook Page No. ___

Page ___ of ___

US SAMPLE LOG IN SHEET

ENERGY ENVIR

Lab Name: Philip Analytical Services Corporation, Burlington Laboratory

Received By (Print Name): K Gwaw

Received By (Signature):

Client Project ID:

REMARKS:		Condition of Samples/Sample Shipment:
Custody Seal(s)	Present ___ Absent ___	rec'd intact
Chain of Custody Records	Present ✓ Absent ___	
Airbill	Present ✓ Absent ___	
Air	FedEx Tracking Number 811681262518	
rs	Phone	
Company		
ress	Dept./Floor/Suite/Room	
	State ZIP 81335 C 197813	
Does Information on Custody Records and Samples Agree?	Yes ✓ No ___	
Date Received at Lab	[illegible]	
Time Received	[illegible]	

Temperature of Coolers

Cooler ID:	Temperature
1 Box	not taken

Relinquished By: [illegible]

Date: [illegible]

Logbook No: ___

Logbook Page No. ___

** TX STATUS REPORT ** AS OF OCT 29 1999 08:28 PAGE.01

PHILIP ANALYTICAL

	DATE	TIME	TO/FROM	MODE	MIN:SEC	PGS	JOB#	STATUS
09	10/29	08:27	1949857 1943	EC--S	00'48"	003	123	OK

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Bob Zimperman / Mike Fukuda
Client: Energy Environmental Research
Re Client Project: 3749-040
FAX #: 949-857-1943
Phone #: 949-552-1803

Samples for: DH Hg Speciation
were received in good condition unless
indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received	
064670	Reagent Blank OHM	99/10/12	99/10/28	Trans
064671	FB-SI-OHM	99/10/12	99/10/28	
064672	R1-SI-OHM *	99/10/12	99/10/28	
064673	R2-SI-OHM	99/10/13	99/10/28	
064674	R3-SI-OHM	99/10/13	99/10/28	
064675	R4-SI-OHM	99/10/14	99/10/28	
064676	FB-SO-OHM	99/10/12	99/10/28	
064677	R1-SO-OHM *	99/10/12	99/10/28	
064678	R2-SO-OHM	99/10/13	99/10/28	
064679	R3-SO-OHM	99/10/13	99/10/28	
064680	R4-SO-OHM	99/10/14	99/10/28	
064701	Blank Batch B	99/10/12	99/10/28	Kinds Blanks
064702	Blank Batch #1	99/10/13	99/10/28	
064703	Blank Batch #2	99/10/13	99/10/28	
064705	Batch Blank 991014	99/10/13	99/10/28	

Comments: * on Hold

Date 99/10/29

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Bob Zimperman / Mike Fukuda
Client: Energy Environmental Research
Re Client Project: 3749-040
FAX #: 949-857-1943
Phone #: 949-552-1803

Samples for: [illegible]
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
064670	Reagent Blank OHM	99/10/12	99/10/28
064671	FB-SI-OHM	99/10/12	99/10/28
064672	R1-SI-OHM	99/10/12	99/10/28
064673	R2-SI-OHM	99/10/13	99/10/28
064674	R3-SI-OHM	99/10/13	99/10/28
064675	R4-SI-OHM	99/10/14	99/10/28
064676	FB-SO-OHM	99/10/12	99/10/28
064677	R1-SO-OHM	99/10/12	99/10/28
064678	R2-SO-OHM	99/10/13	99/10/28
064679	R3-SO-OHM	99/10/13	99/10/28
064680	R4-SO-OHM	99/10/14	99/10/28
064701	Blank Batch B	99/10/12	99/10/28
064702	Blank Batch #1	99/10/13	99/10/28
064703	Blank Batch #2	99/10/13	99/10/28
064705	Batch Blank 991014	99/10/13	99/10/28

Comments: [illegible]

Date 99/10/29

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Bob Zimperman
Client: Energy Environmental Research
Re Client Project: 3749-040
FAX #: 949-857-1943
Phone #: 949-552-1803

Samples for: Hg
were received in good condition unless
indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
064704	RB-OHM-7 HNO3	99/10/13	99/10/28

Comments:

Date 99/10/29

Mike: / Ron

You have requested that we record all sample volumes upon receipt.

The bottles have been marked for volumes and there was not significant leakage during shipment. Will this information suffice?

We will have to adjust the liquid sample volumes during the preparative process. Then we take the samples to a set final volume. That final process volume is what we base the reported results on. We do not normally record the volumes upon receipt but do check for losses during shipment.

Please confirm if you need the volumes upon receipt recorded.

Ron

Appendix E

Audit Data Sheets

Quality Assurance Audits

As specified in the SSTP, a technical system audit (TSA) and meterbox audit was performed at both sampling locations. These audits are explained below.

Technical Systems Audit

Robert Sanford, GE-EERs Project QA Manager, performed a TSA of both the scrubber inlet and outlet sampling procedures for the first and second runs of the test series. The results of the TSA for run 2 are included in this appendix. The TSA logs for the first run are not included since the failed final leak check at the scrubber inlet invalidated the run. The auditor observed the train preparation and recovery procedures in the recovery lab for both sample trains and selected portions of the sampling proceudres at each sample location. A couple of variations from the Ontario Hydro Method or the SSTP were noted during the TSA. These include:

- The target sample volume of 2.5 dscm was exceeded by less than 2% on some runs. This slight exceedance of the target sample volume should have no impact on the test results.
- The filter temperature specification is the greater of 248°F or 27°F higher than the stack temperature. The stack temperature was consistently about 120°F and the filter temperature was maintained above 210°F but not consistently above 248°F. No moisture was observed in the Teflon probe liner or on the filter during or after the first or second test runs.

Meterbox Audit

The accuracy of the sample meterboxes was checked prior to the first test run against a critical orifice to confirm that they were still functioning properly after transport to the sampling locations. This meterbox audit consisted of two runs of 5-7 minute duration at a flowrate of 0.75 cfm. The calculated meter cal factors for this check varied from the calibrated values by 0.5 and 1.4% for meterbox CA4 and by 3.1 and 1.7% for meterbox CA2. These results indicated that both meterboxes were functioning properly. The meterbox audit forms and the calibration form for the critical orifice are included in this apprendix.

Technical Systems Audit for Ontario Hydro Mercury Speciation Method
(Page 1)

AUDITOR NAME Bob Sanford OPERATOR NAME Bob Zimmerman
SAMPLE LOCATION Scrubber Inlet HELPER NAME Jeff Oed
TEST DATE 10/13/99 TEST RUN # R2-SI-OAM

TRAIN PREPERATION

Was glassware cleaned per method? Yes (water & acid rinse) Acid soak? Yes
Funnels, petri dishes, sample jars, wash bottles, tweezers, spatulas cleaned also? Yes
Openings sealed in transit to prevent contamination? Yes
Reagents blended per method? Yes Are they well labeled? Yes
Lab cleaned items still get acid washed before use? Yes
Organized work-area to avoid mixing sample equip? Yes - Inlet & Outlet Trains kept separate
Wash bottles well labeled and organized? All well labeled & color coded
Impingers filled using a graduated cylinder? Yes
Balance check with proper standards? Yes
Grease used on glassware? None used
Surgical gloves worn? Yes

PRE SAMPLING CHECKS

**Preliminary Information used to perform ISO sampling
Moist % 7.6 avg DP 0.394 cyclonic check No - Per SSTP
Nozzle size 0.2550 O2 % 5. CO2 % ~~13.5~~ ~11.5 RCS
Volume 21.5 SCF Barometer 29.8 Sample point Traverse
**Calibration of sampling equipment, unique ID #, date performed

	ID #	Date	Factor
Nozzle	C1	10/1/99	.2550
Pitot	63	9/29/99	CP= 0.84
Thermocouple	2004	9/30/99	—
Meter Box	CA2	10/4/99	Y= 1.0062 DH@ 1.7678

**Train configuration contents of impingers
#1 100 ml KCl #2 100 ml KCl #3 100 ml KCl #4 100 ml HNO3/H2O2 soln.
#5 100 ml KMnO4 H2SO4 #6 100 ml KMnO4 H2SO4 #7 100 ml KMnO4 H2SO4 #8 Silica Gel others —
Filter info Type Teflon Quartz Fiber Number 99100111 Weighed Yes other prep
Comments on train config (no metal allowed) No metal on O2 grease
Probe Nozzle: Material Quartz Type Stainless Glass-1400°F Properly Selected Yes
Probe Liner Material Teflon - Per SSTP - Took an extended amount of time to get the liner up to 248°F.
Pitot: Type S Properly attached (No interference) With mistaking, the nozzle & pitot are on the same axis & separated by ~2". (Continued in notes)
Sampling equipment cleaned and prepared per Method Yes
Initial leak checks Pitot Yes Gas Meter 0.00 CFM 10 in. HG
Meter Box Level Yes Manometers Zeroed? Yes
Temperature stable before starting Probe Yes oven Yes imp ice Yes
ISO Kinetic calculation technique "K" factor Yes other —
Did liquid in Impinger travel from Impinger to impinger No

Technical Systems Audit for Ontario Hydro Mercury Speciation Method
(Page 2)

DURING SAMPLING CHECKS

Probe held level in position at point? YES Nozzle orientation into flow? YES
Ports clean of dust before probe insertion? YES Carefull not scrape nozzle? YES
Pitot lines blown out frequency? BEFORE & ONCE DURING RUN Check Mano zero /level? YES
Material used to seal around probe? CLOTH BAGS ASBESTOS PAPER Probe moved at proper time? YES
Leak checks at port change? BEFORE & AFTER Volume recorded? YES
Maintain temp filter out= 248 TARGET Probe = 248 TARGET Imp out = _____
SEE COMMENTS → Orsat bag taken for O2/CO2? YES - FUME Ports sealed? POSITIVE PRESSURE STACK WITH ASBESTOS PORTS
Filter changed during run? NO New filter No. noted on runsheet? —
List delays where probe left in stack ONLY DELAYS ARE DURING PORT CHANGE DUE TO OBSTRUCTIONS
Data forms completed properly and at proper time? PITOT CHECK SHEET NOT IN PACKAGE -
List any problems during run - ONCE PRE-RUN HEATER PROBLEMS & HARD TO GET ONE MOVING PROBE AROUND OBSTRUCTIONS. - ALSO BOOKS & NOZZLE DURING PREP. THE NOZZLE & FILTER WERE REPLACED.

POST SAMPLING CHECKS

Probe promptly removed from stack? YES Nozzle sealed while cooling? YES
Final leak checks Pitot YES Gas Meter 0.00 CFM 10 " HG
Iso Cks GOOD Filter Condition GOOD -
Openings sealed with TEFLON TAPE Probe YES Filter YES Train YES.
Runsheet filled out completely, legibly and at proper time? HAD TO GET A PITOT CHECK SHEET
Describe what was done to move sample train. PROBE & UMBILICAL SEPARATED FROM TRAIN. CARRIED TO RECOVERY LAB SEPARATELY. TWO PEOPLE TO CARRY PROBE. FILTER REMOVED & SEALED BEFORE MOVING.

(DID NOT OBSERVE THIS SINCE I WAS AT THE ST LOCATION. DID OBSERVED FINAL LEAK DURING 1)

SAMPLE TRAIN RECOVERY

Arrived with openings sealed: probe YES filter YES train YES
Impingers weighed? YES Did train backwash? NO Overflow? NONE
Recorded visual inspection comments for impingers? YES - LOOKED GOOD
Does filter look wet? DRY Is it ripped? NO Is it discolored? LIGHT TAN
Any pieces of filter lost? NO Any particulate lost? NO
Probe wash technique? 3 RINSES WITH DI/HNO3 WITH TEFLON BRUSH IN BETWEEN; 2 PEOPLE UTILIZED
Probe recovered by two people? YES (DAVE LADD & JOHN JACKSON) TO BE ABLE TO MOVE PROBE WITHOUT SPILLING
Any liquid or particulate lost during probe wash? NO
Teflon brush used for: Probe YES Nozzle YES Filter housing YES
Were steps taken to avoid mixing components of different trains? KEPT ON SEPARATE TABLES; COOL
What steps were taken to avoid ambient contamination? CHARCOAL FILTER ON AC; FUME HOOD; LIMITED PERSONNEL IN LAB
Is the first KmnO4 impinger clear? NO
Use pre-cleaned or acid washed sample jars? YES - PRECLEANED TRACE METAL
Is recovery flowchart posted? YES - OVER BOTH RECOVERY TABLES Is it utilized? YES - AT BOTH LOCATIONS
Data recorded in logbook? LOG SHEETS.
Surgical Gloves worn? YES Fume hood utilized? FOR PORTIONS OF RECOVERY
Process samples kept out of recovery lab to prevent contamination? YES
Sample handling: Lid sealed? YES Liquid line? YES
Proper sample label? YES COC filled out properly? YES
KMnO4 jar properly vented? YES Size hole? #70
Method for punching hole? DRILL BIT (WITHOUT DRILL)

Technical Systems Audit for Ontario Hydro Mercury Speciation Method
(Page 3)

COMMENTS

ALL ACTIVITIES PERFORMED ACCORDING TO SSTP.
NO MAJOR PROBLEMS ENCOUNTERED WHICH WOULD IMPACT FINAL RESULT.

- HAD INITIAL PROBLEMS WITH TEMP CONTROLLER BUT BOB FIXED IT. TOOK SOME TIME TO GET PROBE / LINES UP TO TEMP.

- REGARDING PITOT - TC IS AT SAME DEPTH AS PITOT BUT ABOUT 1" OFF AXIS. PITOT & NOZZLE ABOUT 3" AWAY FROM UNISTRUT WHICH HOLDS THE HEATED TEFLON PROBE LINER.

- BOB / JEFF REDUCED NOZZLE SIZE FOR TWO AND SINGLE TESTERAMS VOLUME WAS SLIGHTLY ABOVE THE LIMIT

- FURTHER ANALYSIS FROM TESTERAM SHOWED HIGH O2 LOW CO2 RESULTS. MIKE FUKUDA LOCATED PROBLEMS & FIXED LEAK. RESULTS LOOK MORE REASONABLE.

- THE QUARTZ NOZZLE WAS STORED DURING PREP. THE NOZZLE & FILTER WERE REPLACED & TESTING PROCEEDED. THE ~~NOZZ~~ FILTER WAS REPLACED IN CASE SHARDS OF GLASS THAT COULD ~~BE~~ DAMAGE IT WERE LODGED IN IT.

- I WAS A-TIME SAMPLE LOCATION DURING THE INITIAL LEAKCHECK & FIRST TWO PORT CHANGES. I ~~ALSO~~ OBSERVED THE TRAIN PREP & RELOADING THE TRAIN IN THE LAB. [illegible]

Technical Systems Audit for Ontario Hydro Mercury Speciation Method
(Page 1)

AUDITOR NAME Bob Sanford OPERATOR NAME John Jackson
SAMPLE LOCATION Stack (S3) HELPER NAME Mike Fukuda
TEST DATE 10/13/99 TEST RUN # R2-SO-01m

TRAIN PREPERATION

Was glassware cleaned per method? Yes Acid Rinse Acid soak? Yes
Funnels, petri dishes, sample jars, wash bottles, tweezers, spatulas cleaned also? Yes
Openings sealed in transit to prevent contamination? Yes
Reagents blended per method? Yes Are they well labeled? Yes
Lab cleaned items still get acid washed before use? Yes
Organized work-area to avoid mixing sample equip? Yes - Inlet & Outlet Trains kept separate
Wash bottles well labeled and organized? Yes - + Color Coded.
Impingers filled using a graduated cylinder? Yes
Balance check with proper standards? Yes
Grease used on glassware? No
Surgical gloves worn? Always

PRE SAMPLING CHECKS

**Preliminary Information used to perform ISO sampling
Moist % 12.3 avg DP 1.319 cyclonic check Swirl 5.66° (Performed Prior to First Run)
Nozzle size — O2 % 20.5 CO2 % 11.2
Volume 21.96 Barometer 29.5 Sample point Traverse
**Calibration of sampling equipment, unique ID #, date performed

	ID #	Date	Factor
Nozzle	P-6	9/24/99	.2042
Pitot	94	9/30/99	CP= 0.84
Thermocouple			
Meter Box	CA4	10/4/99	Y= .9992 DH@ 1.7956

Note on this TC

**Train configuration contents of impingers
#1 100ml KCl #2 100ml KCl #3 100ml KCl #4 100ml HNO3-H2O2 Soln.
#5 100ml KMnO4 H2SO4 #6 100ml KMnO4 H2SO4 #7 100ml KMnO4 H2SO4 #8 Silica Gel others —
Filter info Type Quartz Fiber Number 99093040 Weighed Yes other prep —
Comments on train config (no metal allowed) No Metal / No Grease
Probe Nozzle: Material Quartz Type Standard (Button Hook) Properly Selected Selected for 0.75 cfm. This is used for upper limit
Probe Liner Material Teflon - As specified in SSTP
Pitot: Type S Properly attached (No interference) Yes
Sampling equipment cleaned and prepared per Method Yes
Initial leak checks Pitot Yes Gas Meter 0.001 CFM 10 in. HG
Meter Box Level Yes Manometers Zeroed? Yes
Temperature stable before starting Probe Yes oven Yes imp ice Yes
ISO Kinetic calculation technique "K" factor Yes other —
Did liquid in Impinger travel from Impinger to impinger No

Technical Systems Audit for Ontario Hydro Mercury Speciation Method
(Page 2)

DURING SAMPLING CHECKS

Probe held level in position at point? YES Nozzle orientation into flow? YES
Ports clean of dust before probe insertion? YES Carefull not scrape nozzle? YES
Pitot lines blown out frequency? NEGATIVE PRESSURE MOISTURE NO PROBLEM Check Mano zero /level? YES
Material used to seal around probe? RAGS Probe moved at proper time? YES
Leak checks at port change? BEFORE & AFTER Volume recorded? YES
Maintain temp filter out = >210°F Probe = 728°F Imp out = CONDITION LESS THAN 60°F
Orsat bag taken for O2/CO2? YES - FUSITE Ports sealed? WITH RAGS.
Filter changed during run? NO New filter No. noted on runsheet? —
List delays where probe left in stack THERE WAS SOME DELAY BETWEEN PORTS 3 & 4 WHILE WAI
Data forms completed properly and at proper time? YES FOR SCRUBBER LOCATION TO CATCH UP
List any problems during run NO SIGNIFICANT PROBLEMS

MAINTAINED AT LEAST 27°F GREATER THAN STACK TEMP BUT NOT 724°F. (SEE NOTE)

POST SAMPLING CHECKS -

Probe promptly removed from stack? YES Nozzle sealed while cooling? YES
Final leak checks Pitot ✓ Gas Meter 0.001 CFM 12 " HG
Iso Cks GOOD Filter Condition ~~SLIGHT TAN COLOR~~ RCS GOOD CONDITION
Openings sealed with TEFLON TAPE Probe YES Filter YES Train YES
Runsheet filled out completely, legibly and at proper time? YES
Describe what was done to move sample train. SEPARATED TRAIN FILTER & PROBE SEPARED ALL CONDENSATES & MOVED TRAIN TO RECOVERY LAB, IN ELEVATOR

SAMPLE TRAIN RECOVERY

Arrived with openings sealed: probe YES filter YES train YES
Impingers weighed? YES Did train backwash? NO Overflow? NONE
Recorded visual inspection comments for impingers?
Does filter look wet? NO Is it ripped? NO Is it discolored? SLIGHT TAN COLOR
Any pieces of filter lost? NO Any particulate lost? NO
Probe wash technique? 2 PEOPLE USING TEFLON BRUSH (FLEXIBLE); 0.1N & WASHED OREFRAN WITH BRUSH OTHERWISE CONTAINED
Probe recovered by two people? YES 3 PEOPLES WITH BOTTLES & STOPPERS; NO FINGERS; DUPLICATE PROCE
Any liquid or particulate lost during probe wash? NO
Teflon brush used for: Probe YES Nozzle YES Filter housing YES
Were steps taken to avoid mixing components of different trains? RECOVERED ON 2 SEPARATE TABLE
What steps were taken to avoid ambient contamination? CARBON FILTER ON AC: & COLOR CODED ~~NO PLASTIC SAMPLE TUBES~~ LIMITED ACCESS TO LAB BY UNAUTHORIZED PERSONNEL
Is the first KmnO4 impinger clear? NO
Use pre-cleaned or acid washed sample jars? PRE CLEANED - TRACE METAL
Is recovery flowchart posted? ABOVE BOTH RECOVERY TABLES Is it utilized? YES
Data recorded in logbook? IN LOG SHEETS
Surgical Gloves worn? YES Fume hood utilized? FOR PARTS OF RECOVERY
Process samples kept out of recovery lab to prevent contamination? YES
Sample handling: Lid sealed? YES Liquid line? YES
Proper sample label? YES - PER SSTP COC filled out properly? YES - PER SSTP
KMnO4 jar properly vented? YES Size hole? #70 DRILL BIT
Method for punching hole? USED DRILL BIT BY HAND.

COMMENTS

- INFORMED MIKE THAT TARGET SAMPLE VOLUME IS 1-2.5 dscm. (~ 35½ → 88.5 dscf). 1ST DRY VOLUME WAS A BIT HIGH. HE DECIDED THAT THE VOLUME WAS CLOSE ENOUGH & ANY EXCEEDANCE WOULD NOT AFFECT RESULTS. LEFT THE NOZZLE THE SAME SIZE.

- I WAS AT THIS SAMPLING LOCATION DURING THE LAST 2 PORTS & THE FINAL LEAK CHECK & TRAIN TEARDOWN. I OBSERVED THE TRAIN PRIOR RECOVERY IN THE LAB.

- SPEC FOR FILTER TEMP IS 248°F OR 27°F GREATER THAN STACK TEMP WHICHEVER IS HIGHER. FILTER TEMP BEING MAINTAINED AT SIGNIFICANTLY HIGHER TEMP. THAN STACK BUT NOT GREATER THAN 248°F AT ALL TIMES. AT SOME POINTS THE FILTER BOX EXTENDS OUT THE DOOR OF THE CONCRETE SHELL AROUND THE STACKS. ~~IT IS DIFFI~~ MIKE DOES NOT WANT TO TAKE THE CHANCE OF OVERTEMPING THE TEFLON PROBE LINER BY TURNING THE OVEN TEMP UP SIGNIFICANTLY. NO MOISTURE SEEN IN TEFLON PROBE LINER OR IN FILTER DURING RUN 1 OR THIS RUN.

EPA Critical Orifice Calibration Form

(This form used to CALIBRATE critical orifice per EPA 40CFR60, Appendix A, Method 5 §7.2.2)

Critical Orifice ID: 63 AD

Date (m/d/y): 10/6/99

Critical Vacuum (in.Hg): 16

Calibrated by: Bob Z

DATA ENTRY	Run __1__		Run _2__		units
Meter Box Number	CA 2		CA 2		n/a
Meter Calibration Factor, Y	1.0062		1.0062		n/a
Barometric Pressure, Pbar	29.60		29.60		in.Hg
Ambient Temperature, Tamb	72.0		72.0		°F
Elapsed Time, _	5.0		5.0		min
Dry Gas Meter Temperatures	**inlet**	**outlet**	**inlet**	**outlet**	
Initial	72.0	72.0	72.0	72.0	°F
Final	68.0	67.0	67.0	67.0	°F
Average, Tm	**69.8**		**69.5**		°F
Dry Gas Meter:					
Final Volume Reading	281.648		285.280		cu.ft.
Initial Volume Reading	278.000		281.648		cu.ft.
NET Volume, Vm	**3.648**		**3.632**		cu.ft.
Dry Gas Meter Orifice, _H	1.70		1.70		in.WC
Pump Vacuum, VAC	15.0		15.0		in.Hg
K' factor, K'	**13.0651**		**13.0139**		(cu.ft)(°R) / (in.Hg)(min)
% Difference *	0.20		-0.20		%
Average K'	**13.0395**				

* The individual K' values should not differ by more than 0.5% from the average K'.

Checklist for Data Sheets

Plant: IPSC, IPP
City: Delta, UT

	SI - Scrubber Inlet						SO - Stack						Full
Test No.	Pre-I	FB	SI-1	SI-2	SI-3	SI-4	Pre-S	FB	SO-1	SO-2	SO-3	SO-4	**Test**
Field Test Summary			C	C	C	C			C	C	C	C	C
OHM Reduced Data	C	n a	X	C	C	C	C	n a	C	C	C	C	n a
Field Data Form	C	C	X	C	C	C	C	C	C	C	C	C	n a
Impinger Weight Form	C	C	C	C	C	C	C	C	C	C	C	C	n a
Method 3 Data Form	n a	n a				C	rh	n a	C	C	C	C	n a
Velocity Traverse	C	n a	n a	n a	n a	n a	C	n a	n a	n a	n a	n a	n a
Moisture Runsheet	rh	n a	n a	n a	n a	n a	rh	n a	n a	n a	n a	n a	n a
OHM QA QC Form (5 pgs)	n a	X	C	C	C	C	n a	X	C	C	C	C	n a
Method 3 QC Form	n a					C	n a	n a	C	C	C	C	n a
Glassware Checklist	n a	C	n a	n a	C	n a	n a	C	n a	C	n a	n a	n a
Corrective Action Form(s)	n a				3	2	n a	n a	1	n a	n a	n a	n a

n/a = Not Applicable
C = Form Completed and Checked
X = Form Incomplete
rh = Recorded by hand - No form

Problems and Corrective Actions (Summary)

1 Fyrite pump leaks, discontinue use; force-feed Tedlar bag.
2 Inlet M3 samples read hi-O2 - Found leak at inlet to meter box Orsat sampling system (fixed leak during SI-Run4, port 3)
3 Nozzle broken during port change after 2nd port. Replaced nozzle and continue test.

CORRECTIVE ACTION FORM NO. (B) - 55

Originator Mike Fukuda Date: 10/14/99

Person Responsible for Replying: B Zimmerman / McGrath Contract Involved: IPSC

Description of problem and when identified: 10/13/99 - Reported Pyrite Analysis - Sampling Look Diluted! (14-18% O_2)

State cause of problem, if known or suspected: Found Loose Nut on Rotameter in Meter Box, Also - Small 3/32" Hole in Silicon Tubing @ Orifice

Sequence of Corrective Action: (If no responsible person is identified, notify Project Manager immediately. Submit all CA forms to Project Manager for initial approval of CA.)

State, Date, Person and Action Planned:

10/13 - MF - Tightened Nuts, Pulled New Bag - ~16% O_2

10/14 - Re-inspect - Leak Check on Pulled New Sample during Port 1

- Analyzer still Shows 14% - 16% O_2
- Disconnect Tubing from Orifice - Found Leak in Tubing, Replaced
- Pulled T. Bag (Ports 3-5), Analyze - 6% O_2, 9% CO_2
- Still Shows Diluted vs. Stack (7.5%, 10.5%)

Recommend Use Stack DATA.

CA Initially Approved by: _____ Date: _____

Follow up Dates: _____

Final CA Approved By: _____ Date: _____

Information copies to:

RESPONSIBLE PERSON/DEPARTMENT QA/QC MANAGER:

QA/QC MANAGER: _____

PROJECT MANAGER: _____

Figure 6-2. Corrective action form.

Glassware Kits for Speciated Mercury sampling

Train SET Color: PURPLE

Glassware for	Stack Method 5 style		
Type	**Required per train**	**Packed in this box**	**Packed by/ DATE**
Modify Impingers	5	5	J. Dean 9-27-99
Silica Gel Impingers	1	1	"
GS Impingers	2	2	"
"U" tubes	7	7	"
Elbow adapter	0	0	"
Clamps	21	21	"
3" filter housing	1	1	"
"S"	1	1	"
ball adapt filter inlet 1/2" sahn	1	1	"
1/2 3/8 TFE unions	0	0	"
1/2" TFE unions	2	2	"

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS
Location: Scrubber Inlet
Dates: 13 Oct 99

Personnel: BZ / JD
Test Run #: R#2 - S1 - OHM
Sample Train ID: orange

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column	29.80	10/13	DL
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		Y		
Equip soaked >4 hours	before using	minimum of 4 hrs			Y		
All grease removed from glassware	before using	no grease	re-clean reagents		Y		
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		Y		
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		Y		
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y	10/13	
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y	10/13	
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y		
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPSC Personnel: Jeff D. / Bob Z

Location: INLET Test Run #: Run 2 SI OHM

Dates: 10-13-99 Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed ? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		yes	10-12	JD
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1	yes	10-13	JD
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2	NA	NA	NA
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2	yes	10-11	JD
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2	yes	10-13	JD
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice	yes	10-13	JD
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5	yes	10-13	JD
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle		yes	10-13	JD
Field DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5	yes	10-13	JD
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5	~~10-13~~ yes	10-12	BS
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2	yes	10-13	JD
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2	yes	10-13	JD
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2	yes	10-13	JD
Level and zero manometers	initial, and occasional during the runs				yes	10-13	JD
Blow out pitot lines	initial and as required during run				yes	10-13	JD
Complete runsheet header	before sampling	no blank cells	fill out completely		yes	10-13	JD
Confirm that impingers are in the proper order	before sampling	# impingers 1- 8	if not yet used switch, if contamination is	OH HG method	yes	10-13	JD
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run	yes	10-13	JD
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing	yes	10-13	JD

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPSC
Personnel: JEFF D / BOB Z
Location: INLET
Test Run #: Run 2 SI OHM
Dates: 10-13-99
Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	yes	10-13	JD BZ
Ports clean and nozzle installed with no dust from	initially and each port change				yes	10-13	JD BZ
Port sealed while at sample point	each point	leakage	Reseal port		yes	10-13	JD BZ
Probe held level	each point	eyeball	adjust level		yes	10-13	JD BZ
Data recorded to runsheet completely	each traverse point				yes	10-13	JD BZ
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			yes	10-13	JD BZ
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run	yes	10-13	JD BZ
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape		yes	10-13	JD BZ
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader		yes	10-13	JD BZ
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks	yes	10-12	JD BZ
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly		yes	10-13	JD BZ

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: FPS
Location: SCRUBBER INLET
Dates: 10-13-99
Personnel: D. LADD
Test Run #: R2-3I-OHM

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-13-99	D Ladd
Visual comments of train noted on (Imp wt sheet)	during recovery	NA	noted on Imp wt sheet		Y		
Take Reagent blanks	once per blend	50 ml			Y		
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily	Y		
Check Labels, COC for completeness	after recovery	NA	fill out completely		Y		
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4		Y		
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar	Y		
Check that lids are sealed and liquid line marked	before shipping	na	Teflon tape lid and mark level		Y		
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light	Y		
Check that samples are packed properly	before shipping	no loose samples all samples isolated	Repack		Y		

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPSC
Location: S-INLET
Dates: 10/11/99
Personnel: MF
Test Run#: R2-S1-OHM

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		PASS	10/13	
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		PASS	12/9	DJ.
Sample Analysis							
Field Reagent Blank	One per batch	any Hg detected	subtract from sample results (1)		(2) PASS	12/17	TM
Field Blank	One per sample location	none				12/10	DJ.
Lab Spike	most frequent of every 10th sample or each batch	none	none		PASS	12/10	DJ.
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze samples		PASS	12/10	DJ.
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this guideline flag the results, the results may be invalid.

2. Data corrected for Hg in hydroxylamine. No Hg detected in other reagents.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS

Location: SCRUBBER INLET

Dates: 10-13-99

Personnel: J. DEAN / B. ZIMMERMAN / D. LADD

Test Run #: R3-SI-OHM-

Sample Train ID: BLUE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column			
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		Yes	9-27-99	J. DEAN
Equip soaked >4 hours	before using	minimum of 4 hrs			Yes	9-27-99	J. DEAN
All grease removed from glassware	before using	no grease	re-clean reagents		Yes	9-27-99	J. DEAN
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		Yes	9-27-99	J. DEAN
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		Yes	9-27-99	J. DEAN
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y	10-13-99	D. LADD
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y	10-13-99	D. LADD
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y	10-13-99	D. LADD
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPSC Personnel: JEFF D / BOB Z

Location: INLET Test Run #: Run 3 SI OHM

Dates: 10-13-99 Sample Train ID: BLUE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		yes	10-11	JD BZ
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1	yes	10-13	JD BZ
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average <20 deg	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2	NA	NA	NA
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2	yes	10-13	JD BZ
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2	yes	10-13	JD BZ
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice	yes	10-13	JD BZ
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5	yes	10-13	JD BZ
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle		yes	10-13	JD BZ
eld DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5	yes	10-12	B.S.
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5	"	"	"
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2	yes	10-13	JD BZ
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2	yes	10-13	
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2	yes	10-13	
Level and zero manometers	initial, and occasional during the run				yes	10-13	
Blow out pitot lines	initial and as required during run				yes	10-13	
Complete runsheet header	before sampling	no blank cells	fill out completely		yes	10-13	
Confirm that impingers are in the proper order	before sampling	# impingers 1-8	if not yet used switch, if contamination is suspected change train	OH HG method	yes	10-13	
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run	yes	10-13	
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing	yes	10-13	✓

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPSC

Personnel: J.D. - B.Z

Location: INLET

Test Run #: Run 3 ST OHM

Dates: 10-13 -99

Sample Train ID: Blue

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	Yes	10-13	JD BZ
Ports clean and nozzle installed with no dust from port in nozzle	initially and each port change				↓	↓	↓
Port sealed while at sample point	each point	leakage	Reseal port				
Probe held level	each point	eyeball	adjust level				
Data recorded to runsheet completely	each traverse point				✓	✓	✓
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			Yes	10-13	BZ JD
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run	Yes	↓	↓
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape		Yes		
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader		Yes	✓	✓
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks	Yes	10-12	BZ JD
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly		Yes	10-13	JD

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: D. LADD

Location: SCRUBBER INLET

Test Run #: 123-SI-OHM

Dates: 10-14-99

Sample Train ID: BLUE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-14-99	DLADD
Visual comments of train noted on (Imp wt sheet)	during recovery	NA	noted on Imp wt sheet		Y		
Take Reagent blanks	once per blend	50 ml			Y		
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily	Y		
Check Labels, COC for completeness	after recovery	NA	fill out completely		Y		
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4		Y		
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar	Y		
Check that lids are sealed and liquid line marked	before shipping	na	Teflon tape lid and mark level		Y		
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light	Y		
Check that samples are packed properly	before shipping	no loose samples all samples isolated	Repack		Y		

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPSC

Personnel: M.F.

Location: Scrubber Inlet

Test Run #: R3-51-OHM

Dates: 10/13/55

Sample Train ID: BLUE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		yes.	10/13	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		yes	12/9	DJ.
Sample Analysis							
Field Reagent Blank	One per batch	any Hg detected	subtract from sample results (1)		(2)	12/17	TM
Field Blank	One per sample location	none			yes	12/9	DJ.
Lab Spike	most frequent of every 10th sample or each batch	none	none		yes	12/9	DJ
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze samples		yes	12/9	DJ.
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this guideline flag the re the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents.

Glassware Kits for Speciated Mercury sampling

Train SET Color	Blue		
Glassware for	Inlet Method 17 style		
Type	Required per train	Packed in this box	Packed by/ DATE
Modify Impingers	5	5	J. Dean 9-27-99
SilicaGel impingers	1	Ø	"
GS Impingers	2	2	"
"U" tubes	7	7	"
Elbow adapter 3/8 shank to ball	1	1	"
Clamps	16	16	"
3" filter housing	0	Ø	"
"S"	0	Ø	"
ball adapt filter inlet	0	Ø	"
1/2 3/8 TFE unions	1	1	"
1/2" TFE unions	0	Ø	"
other			
other			
other			
other			

Test Project: IPSC - IPP - OHM

Sampling Location: SI - Inlet

Date: Oct (10)/1.1/99

Personnel: MF, JJ

Test No.: Run 4 - 50 - M3

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Collection							
Leak Check Tedlar Bag	prior to test	any leak	replace bag	pressurize to 2 - 4 in. H2O and let stand overnight	Pass	10/14	MF
Check Meterbox - Tedlar Bag Connection	before and after each sample port	any leak	reseal connection		Pass	10/14	
Sample Analysis							
Replicate Analysis	triplicate	Three MW differ from mean by less than 0.3 lb/lb-mole	repeat until three consecutive results meet the control limit		Pass	10/14	

Figure 6-1. QA/QC checklist for EPA Method 3.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS

Location: SCRUBBER INLET

Dates: 10-14-99

Personnel: BOB ZIMMERMAN/DAVE LADD/JEFF DEAN

Test Run #: R4-SI-OHM

Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column	Y	10-13-99	D L
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		Y		
Equip soaked >4 hours	before using	minimum of 4 hrs			Y		
All grease removed from glassware	before using	no grease	re-clean reagents		Y		
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		Y		
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		Y		
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y		
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y		
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y	10-13-99	D Ladd
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: B. Zimmerman / J. Dean

Location: Scrubber Inlet Test Run #: R4-SI-OHM

Dates: 10-14-99 Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed ? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		yes	10-11	JD BZ
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1	yes	10-14	JD BZ
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2	N/A	N/A	N/A
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2	yes	10-14	JD BZ
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2			
Check TC cal date	before sampling	<. months ago	replace TC or post-test calibration	check at critical junction with ice			
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5			
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle				
Field DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5	yes	10-12	B.S.
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5	yes	"	"
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2	yes	10-14	BZ JD
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2			
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2			
Level and zero manometers	initial, and occasional during the runs						
Blow out pitot lines	initial and as required during run						
Complete runsheet header	before sampling	no blank cells	fill out completely				
Confirm that impingers are in the proper order	before sampling	# impingers 1- 8	if not yet used switch, if contamination is	OH HG method			
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run			
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing			

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPS
Personnel: B. Zimperman / J. Dean
Location: Scrubber Inlet
Test Run #: R4-SI-OHM
Dates: 10-14-99
Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	yes	10-14	JD BZ
Ports clean and nozzle installed with no dust from	initially and each port change				↓	↓	↓
Port sealed while at sample point	each point	leakage	Reseal port		↓	↓	↓
Probe held level	each point	eyeball	adjust level		↓	↓	↓
Data recorded to runsheet completely	each traverse point				✓	✓	✓
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			yes	10-14	JD BZ
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run	↓	↓	↓
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape		↓	↓	↓
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader		↓	↓	↓
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks	↓	↓	↓
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly		✓	✓	✓

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: DAVE LADD

Location: SCRUBBER INLET Test Run #: R4-SI-OHM

Dates: 10-14-99 Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-14-99	DLADD
Visual comments of train noted on (Imp wt	during recovery	NA	noted on Imp wt sheet				
Take Reagent blanks	once per blend	50 ml					
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily			
Check Labels, COC for completeness	after recovery	NA	fill out completely				
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4				
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar			
Check that lids are sealed and liquid line	before shipping	na	Teflon tape lid and mark level				
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light			
Check that samples are packed properly	before shipping	no loose samples all samples	Repack				

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPS Personnel: MIKE FUKUDA

Location: SCRUBBER INLET Test Run #: R4-SI-OHM

Dates: 10-14-99 Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		Pass	12/14	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		Pass	12/9	DJ
Sample Analysis							
Field Reagent Blank	One per batch	ny Hg detecte	subtract from sample results		2	12/17	TM
Field Blank	One per sample location	none			PASS	12/9	[illegible]
Lab Spike	most frequent of every 10th sample or each	none	none		PASS	12/9	DJ
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze		PASS	12/9	DJ
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: INNER MOUNTAIN POWER SERVICE

Location: INLET SD RUN #1 FIELD BLANK

Dates:

Personnel: J. DEAN

Test Run #: SD 1 FIELD BLANK

Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column			
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		yes	9-27-99	J. DEAN
Equip soaked >4 hours	before using	minimum of 4 hrs			yes	9-27-99	J. DEAN
All grease removed from glassware	before using	no grease	re-clean reagents		yes	9-27-99	J. DEAN
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		yes	9-27-99	J. DEAN
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		yes	9-27-99	J. DEAN
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Yes	10-12-99	D. LADD
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Yes	10-11-99	D. LADD
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Yes	10-11-99	D LADD
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Yes	10-11-99	D. Ladd
Glassware rinsed with 10% HNO3	before train assembly	NA			Yes	10-11-99	DEJ
KMnO4 blended fresh daily	before using	daily	blend new reagent		Yes	10-12-99	DEJ
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	~~Yes~~ O.K.	10-11-99	D Ladd
Train weighed (data on Imp wt sheet)	before assembly	NA			Yes	10-12-99	D Ladd
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Yes	10-12-99	D Ladd

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: INNER MOUNTAIN POWER Personnel: BOB Z, JEFF D

Location: INLET Test Run #: FIELD BLANK

Dates: 10-12-99 Sample Train ID: OIRANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		yes	10-12	J.D.
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1	yes	10-11	B.Z. J.D
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average <20 deg	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2	N/A	N/A	N/A
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2	yes	#16 3 10-12	B.Z. J.D.
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2	yes	10-12	B.Z. J.D
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice	yes	10-12	B.Z. J.D
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5	yes	10-12	B.Z. J.D
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle		yes	#9 10-12	B.Z. J.D.
Field DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5			
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5			
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2	yes	10-12	B.Z. J.D
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2	yes	10-12	B.Z J.D
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2	yes	10-12	B.Z. J.D
Level and zero manometers	initial, and occasional during the run				yes	10-12	B.Z. J.D
Blow out pitot lines	initial and as required during run				yes	10-12	B.Z J.D
Complete runsheet header	before sampling	no blank cells	fill out completely		yes	10-12	B.Z J.D
Confirm that impingers are in the proper order	before sampling	# impingers 1-8	if not yet used switch, if contamination is suspected change train	OH HG method	yes	10-12	B.Z J.D
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run	yes	10-12	B.Z. J.D
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing	N/A	N/A	N/A

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: INNER MOUNTAIN POWER

Personnel: BOB Z JEFF DEAN

Location: INLET

Test Run #: FIELD BLANK

Dates: 10-12-99

Sample Train ID: OTA-MEC

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan			
Ports clean and nozzle installed with no dust from port in nozzle	initially and each port change						
Port sealed while at sample point	each point	leakage	Reseal port	FIELD	BLANK		
Probe held level	each point	eyeball	adjust level				
Data recorded to runsheet completely	each traverse point						
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			N/A	N/A	N/A
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run	YES	10-12	JD BZ
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape		Yes	10-12	JD
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader		N/A	N/A	N/A
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks	YES	10-12	J.D. B.Z.
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly		YES	10-12	J.D.

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: B2-JP-DC

Location: SCRUBBER INLET

Test Run #: FIELD BLANK

Dates: 10-12-99

Sample Train ID: ORANGE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Yes	10-12-99	DCL
Visual comments of train noted on (Imp wt sheet)	during recovery	NA	noted on Imp wt sheet		Yes	↓	↓
Take Reagent blanks	once per blend	50 ml			Yes	10-12-99	DCL
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily	Yes	10-12-99	DC
Check Labels, COC for completeness	after recovery	NA	fill out completely		Yes	↓	↓
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4		Yes	↓	↓
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar	Yes	10-12-99	DC
Check that lids are sealed and liquid line marked	before shipping	na	Teflon tape lid and mark level		↓	↓	↓
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light	↓	↓	↓
Check that samples are packed properly	before shipping	no loose samples all samples isolated	Repack		↓	↓	↓

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPS

Personnel: MF

Location: Inlet

Test Run #: FR 51. OHM

Dates: 10/12/99

Sample Train ID: Orange

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		N/A	10/12	
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		N/A		
Sample Analysis							
Field Reagent Blank	One per batch	any Hg detected	subtract from sample results (1)		2	12/17	[illegible]
Field Blank	One per sample location	none			N/A	N/A	DJ
Lab Spike	most frequent of every 10th sample or each batch	none	none		N/A	12/9	DJ
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze samples		PASS	12/14	DJ
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this guideline flag the re the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents

Glassware Kits for Speciated Mercury sampling

Train SET Color	ORANGE		
Glassware for	Inlet Method 17 style		
Type	Required per train	Packed in this box	Packed by/ DATE
Modify Impingers	5	5	J.Deas 9-27-99
SilicaGel impingers	1	1	"
GS Impingers	2	2	"
"U" tubes	7	7	"
Elbow adapter 3/8 shank to ball	1	1	"
Clamps	16	16	"
3" filter housing	0	Ø	"
"S"	0	Ø	"
ball adapt filter inlet	0	Ø	"
1/2 3/8 TFE unions	1	1	"
1/2" TFE unions	0	Ø	"
other			
other			
other			
other			

Test Project: IPSC IPP OHM

Sampling Location: STACK, UNIT 2

Date: 13 OCT. 1999

Personnel: MF / JJ

Test No.: Run 2 - 50 - M3

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Collection							
Leak Check Tedlar Bag	prior to test	any leak	replace bag	pressurize to 2 - 4 in. H2O and let stand overnight	PASS	10/13	[illegible]
Check Meterbox - Tedlar Bag Connection	before and after each sample port	any leak	reseal connection		PASS	10/13	[illegible]
Sample Analysis							
Replicate Analysis	triplicate	Three MW differ from mean by less than 0.3 lb/lb-mole	repeat until three consecutive results meet the control limit		PASS	10/13	[illegible]

Figure 6-1. QA/QC checklist for EPA Method 3.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS
Location: SCRUBBER OUTLET
Dates: 10-13-99

Personnel: J. JACKSON / M. FUKUDA
Test Run #: R2-30-OHM
Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column	Y	10-13-99	DL
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		Y		
Equip soaked >4 hours	before using	minimum of 4 hrs			Y		
All grease removed from glassware	before using	no grease	re-clean reagents		Y		
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		Y		
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		Y		
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y		
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y		
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y	10-13-99	DL
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: Jackson / MF

Location: Scrubber Outlet Test Run #: R2-SO-OHM

Dates: 13 Oct 97 Sample Train ID: Amber

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed ? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		Y	10/12	
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1		10/10	
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2		10/10	
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2		10/10	
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2		10/13	
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice		10/12	
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5		10/13	
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle			10/	
Field DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5		10/12	
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5		10/12	
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2		10/13	
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2		10/13	
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2			
Level and zero manometers	initial, and occasional during the runs						
Blow out pitot lines	initial and as required during run						
Complete runsheet header	before sampling	no blank cells	fill out completely				
Confirm that impingers are in the proper order	before sampling	# impingers 1- 8	if not yet used switch, if contamination is	OH HG method			
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run			
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing			

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: Jenkins / MF

Location: Scrubber Outlet

Test Run #: R2 30 - Cl+M

Dates: 13 Oct 99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	Y	10/13	[illegible]
Ports clean and nozzle installed with no dust from	initially and each port change				↓	↓	↓
Port sealed while at sample point	each point	leakage	Reseal port		↓	↓	↓
Probe held level	each point	eyeball	adjust level		↓	↓	↓
Data recorded to runsheet completely	each traverse point				↓	↓	↓
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			Y	10/13	[illegible]
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run	Y	↓	↓
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape		↓	↓	↓
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader		↓	↓	↓
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks	↓	↓	[illegible]
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly		↓	↓	

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: D. LAIDD

Location: SCRUBBER OUTLET Test Run #: B2-80-OHM

Dates: 10-13-99 Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-13-99	D LAIDD
Visual comments of train noted on (Imp wt	during recovery	NA	noted on Imp wt sheet		Y		
Take Reagent blanks	once per blend	50 ml			Y		
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily	Y		
Check Labels, COC for completeness	after recovery	NA	fill out completely		Y		
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4		Y		
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar	Y		
Check that lids are sealed and liquid line	before shipping	na	Teflon tape lid and mark level		Y		
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light	Y		
Check that samples are packed properly	before shipping	no loose samples all samples	Repack		Y		

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPSC

Personnel: M Fuhrbacher

Location: S. Outlet

Test Run #: RL-50-OHM

Dates: 10/13/99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		PASS	10/13	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		PASS	12/10	[illegible]
Sample Analysis							
Field Reagent Blank	One per batch	ny Hg detecte	subtract from sample results		2	12/17	TPM
Field Blank	One per sample location	none			PASS	12/10	[illegible]
Lab Spike	most frequent of every 10th sample or each	none	none		PASS	12/10	[illegible]
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze		PASS	12/10	[illegible]
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents

Glassware Kits for Speciated Mercury sampling

Train SET Color: LT- Green

Glassware for	Stack Method 5 style		
Type	**Required per train**	**Packed in this box**	**Packed by/ DATE**
Modify Impingers	5	5	[illegible] 9-27-99
Silica Gel Impingers	1	1	"
GS Impingers	2	2	"
"U" tubes	7	7	"
Elbow adapter	0	~~0~~	"
Clamps	21	21	"
3" filter housing	1	1	"
"S"	1	1	"
ball adapt filter inlet 1/2" sahn	1	1	"
1/2 3/8 TFE unions	0	~~0~~	"
1/2" TFE unions	2	2	"

Test Project: IPSC IPP OHM

Sampling Location: Unit #2 - Stack

Date: 13 OCT 1999

Personnel: M. Fukuda / J. Jackson

Test No.: R3-50-~~04~~ M3

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Collection							
Leak Check Tedlar Bag	prior to test	any leak	replace bag	pressurize to 2 - 4 in. H2O and let stand overnight	PASS	10/13	MF
Check Meterbox - Tedlar Bag Connection	before and after each sample port	any leak	reseal connection		PASS	10/13	MF
Sample Analysis							
Replicate Analysis	triplicate	Three MW differ from mean by less than 0.3 lb/lb-mole	repeat until three consecutive results meet the control limit		PASS	10/13	MF

Figure 6-1. QA/QC checklist for EPA Method 3.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS

Location: SCRUBBER OUTLET

Dates: 10-13-99

Personnel: J. JACKSON / M. FUKUDA

Test Run #: R3-50-OHM

Sample Train ID: LT. GREEN

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column			
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		yes	9-27-99	J. DEAN
Equip soaked >4 hours	before using	minimum of 4 hrs			yes	9-27-99	J. DEAN
All grease removed from glassware	before using	no grease	re-clean reagents		yes	9-27-99	J. DEAN
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		yes	9-27-99	J. DEAN
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		yes	9-27-99	J. DEAN
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y	10-13-99	D. LADD
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y	10-13-99	D. LADD
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y	10-13-99	D. LADD
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPS
Personnel: JT / DF
Location: Scrubber outlet
Test Run #: R3-60-OHM
Dates: 13 Oct 99
Sample Train ID: Green

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		Y	10/13	JT
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1			
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average <20 deg	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2			
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2			
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2			
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice			
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5			
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle				
.eld DH@ check. or	before sampling	+/-3 %	use another meter	EPA Method 5			
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5			
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2			
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2			
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2			
Level and zero manometers	initial, and occasional during the runs						
Blow out pitot lines	initial and as required during run						
Complete runsheet header	before sampling	no blank cells	fill out completely				
Confirm that impingers are in the proper order	before sampling	# impingers 1-8	if not yet used switch, if contamination is suspected change train	OH HG method			
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run			
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing			

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: JS / MF

Location: Scrubber Outlet

Test Run #: R3 - SO - OHM

Dates: 13 Oct 97

Sample Train ID: Green

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	Y	10/13	JS
Ports clean and nozzle installed with no dust from port in nozzle	initially and each port change						
Port sealed while at sample point	each point	leakage	Reseal port				
Probe held level	each point	eyeball	adjust level				
Data recorded to runsheet completely	each traverse point						
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			Y		JS
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run			
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape				
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader				
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks			
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly				

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: D. LADD

Location: Scrubber outlet

Test Run #: R3-SO-OHM

Dates: 10-14-99

Sample Train ID: CT Green

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-14-99	D LADD
Visual comments of train noted on (Imp wt sheet)	during recovery	NA	noted on Imp wt sheet		Y		
Take Reagent blanks	once per blend	50 ml			Y		
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily	Y		
Check Labels, COC for completeness	after recovery	NA	fill out completely		Y		
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4		Y		
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar	Y		
Check that lids are sealed and liquid line marked	before shipping	na	Teflon tape lid and mark level		Y		
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light	Y		
Check that samples are packed properly	before shipping	no loose samples all samples isolated	Repack		Y		

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPSC

Personnel: M. Fuhler

Location: Sc. Ont/A

Test Run #: R3-50.OHM

Dates: 10/14/99

Sample Train ID: LH GrH

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		Pass	10/14	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		Pass	12/10	[illegible]
Sample Analysis							
Field Reagent Blank	One per batch	any Hg detected	subtract from sample results (1)		2	12/17	TM
Field Blank	One per sample location	none			Pass	12/10	DS
Lab Spike	most frequent of every 10th sample or each batch	none	none		↓	↓	DS
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze samples		↓	↓	DS
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this guideline flag the re the results may be invalid.

2. data corrected for Hg in hydroxylamine., No Hg in other reagents.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS
Location: SCRUBBER OUTLET
Dates: 10-14-99

Personnel: J. DEAN / D. LADD
Test Run #: R4-SO-OHM
Sample Train ID: PURPLE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column	Y	10-14-99	D LADD
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		Y		
Equip soaked >4 hours	before using	minimum of 4 hrs			Y		
All grease removed from glassware	before using	no grease	re-clean reagents		Y		
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		Y		
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		Y		
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Y		
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Y		
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Y	10-14-99	D Ladd
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Y		
Glassware rinsed with 10% HNO3	before train assembly	NA			Y		
KMnO4 blended fresh daily	before using	daily	blend new reagent		Y		
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Y		
Train weighed (data on Imp wt sheet)	before assembly	NA			Y		
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Y		

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: J. JACKSON / M. FUKUDA

Location: SCRUBBER OUTLET Test Run #: R4-SO-OHM

Dates: 10-14-99 Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed ? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		Y	10/14	JJ
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1			
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2			
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2			
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2			
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice			
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5			
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle				
Field DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5			
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5			
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2			
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2			
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2			
Level and zero manometers	initial, and occasional during the runs						
Blow out pitot lines	initial and as required during run						
Complete runsheet header	before sampling	no blank cells	fill out completely				
Confirm that impingers are in the proper order	before sampling	# impingers 1- 8	if not yet used switch, if contamination is	OH HG method			
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run			
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing			

TABLE 6-1c. Ontario Hydro Method QA / QC

Test Project: IPS Personnel: DAVE LADD

Location: SCRUBBER OUTLET Test Run #: R4-50-OHM

Dates: 10-14-99 Sample Train ID: PURPLE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sample Train Recovery							
Openings of sampling train received sealed	from the stack	NA	reseal, note on Imp wt sheet		Y	10-14-99	D Ladd
Visual comments of train noted on (Imp wt	during recovery	NA	noted on Imp wt sheet				
Take Reagent blanks	once per blend	50 ml					
KMnO4 Reagent Blanks	once per blend	50 ml		Blend new batch daily			
Check Labels, COC for completeness	after recovery	NA	fill out completely				
Jars 3 and 5 have pink color (not clear)	90 minutes after recovery	visible color	Add more KMnO4				
Cap of KMNO4 vented follow Figure 5-4	before shipping	all samples	note deviations on Imp wt sheet	Do not fill jar more than 75% allow head space in jar			
Check that lids are sealed and liquid line	before shipping	na	Teflon tape lid and mark level				
Make sure clear sample jars are foil wrapped	before shipping	NA		Protect contents from Ultra Violet light			
Check that samples are packed properly	before shipping	no loose samples all samples	Repack				

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: J Jackson / M. Fukuda

Location: Scrubber Outlet

Test Run #: 24-50-OHN

Dates: 10-14-99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	Y	10/14	JJ
Ports clean and nozzle installed with no dust from	initially and each port change						
Port sealed while at sample point	each point	leakage	Reseal port				
Probe held level	each point	eyeball	adjust level				
Data recorded to runsheet completely	each traverse point						
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			Y	10/14	JJ
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run			
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape				
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader				
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks			
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly				

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPS Personnel: M. FUKUDA

Location: Scrubber Outlet Test Run #: R4-50-OHM

Dates: 10-14-99 Sample Train ID: Purple.

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		Pass	10/14	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors		Pass	12/10	[illegible]
Sample Analysis							
Field Reagent Blank	One per batch	ny Hg detecte	subtract from sample results		2	12/17	[illegible]
Field Blank	One per sample location	none			Pass	12/10	[illegible]
Lab Spike	most frequent of every 10th sample or each	none	none		Pass	12/10	[illegible]
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze		Pass	12/10	[illegible]
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents.

TABLE 6-1. Ontario Hydro Method QA / QC

Test Project: IPS

Location: SCRUBBER OUTLET

Dates: 10-12-99

Personnel: J. DEAN

Test Run #: F.B

Sample Train ID: PURPLE

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Offsite Activities							
Aneroid Barometer check	before using	0.1 " Hg	adjust linkage	calibrate against HG column			
Check that fresh Nitric acid used for glassware acid wash	before using	< 6 months	get new reagents		yes	9-27-99	J. DEAN
Equip soaked >4 hours	before using	minimum of 4 hrs			yes	9-27-99	J. DEAN
All grease removed from glassware	before using	no grease	re-clean reagents		yes	9-27-99	J. DEAN
Sample jars, funnels, wash bottles, tweezers, and brushes cleaned	before using		buy precleaned for Metals		yes	9-27-99	J. DEAN
Seal Train openings and put into sets (mark with colored tape)	before using	3 independent sets easily identified	remark trains		yes	9-27-99	J. DEAN
Confirm that calibration for precision lab balance used to weigh filter or solids is current	before using	annual certification	calibrate or get new balance	check with "S" weights	Yes	10-12-99	[illegible]
Check reagent expiration date	before using	< than 6 months old for open container	acquire new reagents		Yes	10-12-99	[illegible]
Sample Train Assembly							
Sufficient solutions blended for planned samples	at start of testing	Field and Reagent blanks	blank all reagents and each batch of KMnO4		Yes	10-12-99	[illegible]
Check field balance calibration	before using	+/- .1 Gram	get new balance	"S" type standards	Yes	10-12-99	[illegible]
Glassware rinsed with 10% HNO3	before train assembly	NA			Yes	10-11-99	[illegible]
KMnO4 blended fresh daily	before using	daily	blend new reagent		Yes	10-12-99	[illegible]
No wetted metal in the sampling train	before assembly	may interfere with metals	replace metal components	teflon or glass coated OK	Yes	10-12-99	[illegible]
Train weighed (data on Imp wt sheet)	before assembly	NA			Yes	10-12-99	[illegible]
Confirm that filter has been pre-weighted (record filter No on Impinger Weight Sheet)	before assembly	NA			Yes	10-12-99	[illegible]

FB

FB

TABLE 6-1a. Ontario Hydro Method QA / QC

Test Project: IPP

Personnel: JS / MF

Location: Stack unit 2

Test Run #: Field Blank

Dates: 12 Oct 99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Pre - Sampling Activities							
Preliminary moisture	before Iso run	NA	see historical data		Y	10/11	JS
Mark sample points on probe	before sampling	NA	mark probe	EPA Method 1	Y	↓	↓
Cyclonic flow check	once per location per load condition, or use historical data	absolute value of angle average <20 deg	find new location, install swirl vanes, or use probe rotation technique	EPA Method 2	Y	↓	↓
Check Pitot Tube Cal date	before sampling	< 6 months ago	get new pitot or post-test calibration	EPA Method 2	Y	10/12	↓
Pitot Tube Inspection	before sampling	not damaged	repair or replace	EPA Method 2	Y	10/11	↓
Check TC cal date	before sampling	< months ago	replace TC or post-test calibration	check at critical junction with ice			
Check Dry gas meter cal	before sampling	< 6 months ago	replace meter or post-test calibration	EPA Method 5	Y	10/12	↓
Measure glass Nozzle	before sampling	< .004" max vs min	replace Nozzle	EPA Method 5			
.eld DH@ check, or	before sampling	+/-3 %	use another meter	EPA Method 5	Y	10/12	↓
Field orifice check	before sampling	+/-2 %	use another meter	EPA Method 5	Y	↓	↓
Nozzle spacing to pitot and TC	before sampling	NA	adjust	EPA Method 2	Y	↓	↓
"A" side of pitot into the flow	before sampling	NA	reverse	EPA Method 2	Y	↓	↓
Pitot leak checks	before sampling	no leak in 15 seconds	fix and recheck	EPA Method 2	Y	↓	↓
Level and zero manometers	initial, and occasional during the runs				Y	↓	↓
Blow out pitot lines	initial and as required during run				Y	↓	↓
Complete runsheet header	before sampling	no blank cells	fill out completely		Y	↓	↓
Confirm that impingers are in the proper order	before sampling	# impingers 1-8	if not yet used switch, if contamination is suspected change train	OH HG method	Y	↓	↓
Sampling system leak check	initial, port changes, and final	.02"H2O or 4% of avg sampling rate	locate and repair leak	post leak check done@ vacuum > 1" HG than max during run	Y	↓	↓
Wait for M17 filter to heat up in stack with nozzle out of flow	each port change	wait > 5 minutes	NA	stabilizes temp of filter housing	Y	↓	↓

TABLE 6-1b. Ontario Hydro Method QA / QC

Test Project: IPS

Personnel: Jackson

Location: Stack

Test Run #: Field Blank

Dates: 12 Oct 99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Sampling Activities							
Simultaneous sampling with other locations	per Test Plan	per Test Plan	stop sampling and inform field test leader	Per Test Plan	Y	10/12	[illegible]
Ports clean and nozzle installed with no dust from port in nozzle	initially and each port change						
Port sealed while at sample point	each point	leakage	Reseal port				
Probe held level	each point	eyeball	adjust level				
Data recorded to runsheet completely	each traverse point						
Post Sampling Activities							
Probe promptly removed from stack	end of run	few minutes			Y	10/12	
Final leak checks recorded	end of run	.02"H2O or 4% of avg sampling rate	report problems to Field Team Leader	record volume at vacuum 1" Hg more than Max on run			
All openings sealed with TFE tape	end of run	all openings	seal withTFE tape				
Iso Kinetic check	end of run	90-110 %	report problems to Field Team Leader				
Field Blank train	once per location			Duplicate all steps taken during run including initial, port change, and post testleak checks			
Check runsheet for completeness and legibility	end of run	no empty entries	fill in all blanks legibly				

INTERMOUTAIN GENERATING STATION UNIT 2 BOILER OPERATING DATA FOR RUN 2

	Coal Feed Rate Tons Totalized	Generator Output MW Gross	Steam Gen. Rate lbs/hr. X1000	No. of Burners Firing (Pulverizers inservice)								Excess O2 %
				A	B	C	D	E	F	G	H	
Timestamp	2COAXI185A	2TGBPK0022	2FWAFT0025	2SGAES0005	2SGAES0006	2SGAES0007	2SGAES0008	2SGAES0009	2SGAES0010	2SGAES0011	2SGAES0012	2INAKV0061
Average	**335**	**875**	**6226**	**ON**	**ON**	**ON**	**OFF**	**ON**	**ON**	**ON**	**ON**	**2.59**
13-Oct-99 11:45:00	178516	872	6,198	ON	ON	ON	OFF	ON	ON	ON	ON	2.66
13-Oct-99 11:50:00	178544	875	6,198	ON	ON	ON	OFF	ON	ON	ON	ON	2.68
13-Oct-99 11:55:00	178572	874	6,220	ON	ON	ON	OFF	ON	ON	ON	ON	2.59
13-Oct-99 12:00:00	178599	874	6,209	ON	ON	ON	OFF	ON	ON	ON	ON	2.47
13-Oct-99 12:05:00	178627	873	6,195	ON	ON	ON	OFF	ON	ON	ON	ON	2.35
13-Oct-99 12:10:00	178655	876	6,193	ON	ON	ON	OFF	ON	ON	ON	ON	2.36
13-Oct-99 12:15:00	178683	877	6,237	ON	ON	ON	OFF	ON	ON	ON	ON	2.36
13-Oct-99 12:20:00	178711	873	6,213	ON	ON	ON	OFF	ON	ON	ON	ON	2.50
13-Oct-99 12:25:00	178739	876	6,205	ON	ON	ON	OFF	ON	ON	ON	ON	2.46
13-Oct-99 12:30:00	178767	876	6,196	ON	ON	ON	OFF	ON	ON	ON	ON	2.41
13-Oct-99 12:35:00	178794	873	6,202	ON	ON	ON	OFF	ON	ON	ON	ON	2.37
13-Oct-99 12:40:00	178822	875	6,177	ON	ON	ON	OFF	ON	ON	ON	ON	2.39
13-Oct-99 12:45:00	178851	875	6,226	ON	ON	ON	OFF	ON	ON	ON	ON	2.42
13-Oct-99 12:50:00	178878	877	6,288	ON	ON	ON	OFF	ON	ON	ON	ON	2.45
13-Oct-99 12:55:00	178906	873	6,265	ON	ON	ON	OFF	ON	ON	ON	ON	2.47
13-Oct-99 13:00:00	178933	875	6,225	ON	ON	ON	OFF	ON	ON	ON	ON	2.71
13-Oct-99 13:05:00	178961	876	6,261	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 13:10:00	178988	871	6,238	ON	ON	ON	OFF	ON	ON	ON	ON	2.70
13-Oct-99 13:15:00	179016	875	6,239	ON	ON	ON	OFF	ON	ON	ON	ON	2.66
13-Oct-99 13:20:00	179044	877	6,245	ON	ON	ON	OFF	ON	ON	ON	ON	2.51
13-Oct-99 13:25:00	179072	873	6,246	ON	ON	ON	OFF	ON	ON	ON	ON	2.62
13-Oct-99 13:30:00	179100	874	6,239	ON	ON	ON	OFF	ON	ON	ON	ON	2.66
13-Oct-99 13:35:00	179128	875	6,203	ON	ON	ON	OFF	ON	ON	ON	ON	2.49
13-Oct-99 13:40:00	179156	874	6,271	ON	ON	ON	OFF	ON	ON	ON	ON	2.68
13-Oct-99 13:45:00	179184	876	6,256	ON	ON	ON	OFF	ON	ON	ON	ON	2.65
13-Oct-99 13:50:00	179212	874	6,262	ON	ON	ON	OFF	ON	ON	ON	ON	2.63
13-Oct-99 13:55:00	179240	875	6,275	ON	ON	ON	OFF	ON	ON	ON	ON	2.60
13-Oct-99 14:00:00	179268	875	6,244	ON	ON	ON	OFF	ON	ON	ON	ON	2.57
13-Oct-99 14:05:00	179296	873	6,269	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
13-Oct-99 14:10:00	179324	876	6,271	ON	ON	ON	OFF	ON	ON	ON	ON	2.48
13-Oct-99 14:15:00	179352	875	6,220	ON	ON	ON	OFF	ON	ON	ON	ON	2.50
13-Oct-99 14:20:00	179380	873	6,261	ON	ON	ON	OFF	ON	ON	ON	ON	2.49
13-Oct-99 14:25:00	179408	873	6,208	ON	ON	ON	OFF	ON	ON	ON	ON	2.71
13-Oct-99 14:30:00	179436	876	6,220	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 14:35:00	179463	873	6,256	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 14:40:00	179491	875	6,216	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 14:45:00	179519	874	6,211	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 14:50:00	179547	873	6,189	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
13-Oct-99 14:55:00	179575	874	6,189	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 15:00:00	179603	877	6,201	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 15:05:00	179631	875	6,224	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 15:10:00	179659	875	6,179	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 15:15:00	179687	875	6,184	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 15:20:00	179715	874	6,233	ON	ON	ON	OFF	ON	ON	ON	ON	2.73

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER
OPERATING DATA FOR RUN 2

	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Casing A	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033
Average	**8.05**	**291**	**293**	**0.6112**
Casing B	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037
Average	**8.43**	**322**	**316**	**0.7311**
Casing C	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**8.28**	**294**	**287**	**0.5466**
Average/Total	**8.25**	**303**	**299**	**1.889**

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER OPERATING DATA FOR RUN 2

	A Casing Fabric Filter				B Casing Fabric Filter				C Casing Fabric Filter			
	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Timestamp	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**8.05**	**291**	**293**	**0.61**	**8.43**	**322**	**316**	**0.7311**	**8.28**	**294**	**287**	**0.5466**
13-Oct-99 11:45:00	8.11	286	291	0.5488	8.37	314	310	0.8215	8.21	288	282	0.4567
13-Oct-99 11:50:00	7.81	286	291	0.6188	8.29	314	310	0.7086	8.21	288	280	0.5258
13-Oct-99 11:55:00	8.06	286	291	0.6356	8.46	315	310	0.7237	8.30	288	283	0.4215
13-Oct-99 12:00:00	8.12	287	292	0.6383	8.37	315	311	0.8121	8.37	289	280	0.4289
13-Oct-99 12:05:00	7.94	287	292	0.4731	8.39	316	311	0.8086	8.39	289	283	0.5096
13-Oct-99 12:10:00	7.85	288	292	0.7192	8.46	316	310	0.6500	8.42	290	281	0.5121
13-Oct-99 12:15:00	7.79	288	293	0.7328	8.29	317	310	0.7504	8.25	290	282	0.4587
13-Oct-99 12:20:00	8.18	288	293	0.5508	8.40	317	312	0.8062	8.19	291	281	0.5043
13-Oct-99 12:25:00	8.06	289	293	0.6160	8.38	317	313	0.7356	8.13	291	285	0.5531
13-Oct-99 12:30:00	7.95	289	294	0.6887	8.27	318	313	0.6903	8.07	291	285	0.5637
13-Oct-99 12:35:00	7.90	289	294	0.6477	8.30	319	312	0.7996	8.06	292	285	0.3481
13-Oct-99 12:40:00	7.78	291	294	0.6137	8.40	321	313	0.7625	8.04	293	286	0.5208
13-Oct-99 12:45:00	8.02	292	294	0.5613	8.40	324	314	0.8457	8.40	295	286	0.5623
13-Oct-99 12:50:00	8.06	292	295	0.6258	8.28	324	316	0.6828	8.46	295	288	0.5531
13-Oct-99 12:55:00	7.87	292	295	0.6500	8.29	323	316	0.7555	8.27	294	285	0.5051
13-Oct-99 13:00:00	7.81	292	295	0.5031	8.19	323	315	0.8375	8.34	293	286	0.5289
13-Oct-99 13:05:00	7.84	292	295	0.5610	8.20	322	315	0.6324	8.13	293	287	0.5945
13-Oct-99 13:10:00	7.84	291	294	0.5774	8.15	322	315	0.7778	8.26	293	284	0.4961
13-Oct-99 13:15:00	7.87	291	294	0.5520	8.29	322	315	0.6461	8.20	293	287	0.6125
13-Oct-99 13:20:00	8.46	291	294	0.6035	8.62	322	316	0.7926	8.15	293	284	0.5817
13-Oct-99 13:25:00	7.91	291	294	0.6192	8.30	322	315	0.7004	8.12	294	286	0.6231
13-Oct-99 13:30:00	8.06	291	293	0.6887	8.40	322	316	0.6692	8.25	294	286	0.5375
13-Oct-99 13:35:00	7.79	291	292	0.5981	8.06	322	315	0.6672	7.98	295	289	0.6024
13-Oct-99 13:40:00	7.98	291	292	0.4578	8.35	323	316	0.6137	8.02	296	286	0.6160
13-Oct-99 13:45:00	7.83	292	292	0.6410	8.27	326	317	0.5582	8.05	297	290	0.5695
13-Oct-99 13:50:00	8.06	292	293	0.5809	8.52	326	318	0.5508	8.20	298	288	0.5750
13-Oct-99 13:55:00	8.18	294	293	0.6278	8.51	326	319	0.6824	8.56	299	289	0.5414
13-Oct-99 14:00:00	8.32	294	293	0.6098	9.10	326	319	0.7344	8.79	297	288	0.5841
13-Oct-99 14:05:00	8.30	294	293	0.5953	8.96	326	318	0.6809	8.40	296	291	0.6590
13-Oct-99 14:10:00	8.35	294	293	0.6863	8.65	326	318	0.6156	8.34	297	289	0.5061
13-Oct-99 14:15:00	8.27	292	293	0.6481	8.54	326	319	0.7449	8.34	296	292	0.6010
13-Oct-99 14:20:00	8.17	293	294	0.5805	8.55	326	320	0.7039	8.20	296	291	0.6184
13-Oct-99 14:25:00	8.20	294	294	0.6065	8.58	326	320	0.7418	8.46	296	289	0.4918
13-Oct-99 14:30:00	8.25	294	294	0.6012	8.60	326	320	0.7953	8.53	297	289	0.5762
13-Oct-99 14:35:00	8.44	293	294	0.5631	8.37	326	318	0.8355	8.44	296	292	0.5797
13-Oct-99 14:40:00	8.28	293	294	0.6871	8.65	326	318	0.7668	8.27	296	292	0.6465
13-Oct-99 14:45:00	8.05	293	294	0.6156	8.48	326	319	0.7453	8.17	297	292	0.3918
13-Oct-99 14:50:00	7.92	293	294	0.5336	8.27	325	319	0.7645	8.07	297	292	0.5692
13-Oct-99 14:55:00	8.29	293	294	0.5711	8.52	325	320	0.8129	8.48	297	292	0.5797
13-Oct-99 15:00:00	8.20	293	294	0.6703	8.45	325	319	0.7055	8.39	297	292	0.6246
13-Oct-99 15:05:00	8.21	293	294	0.6569	8.41	325	318	0.6930	8.40	297	293	0.5613
13-Oct-99 15:10:00	7.86	293	294	0.6930	8.55	325	318	0.7946	8.40	298	290	0.5016
13-Oct-99 15:15:00	8.11	292	294	0.5117	8.55	326	320	0.8488	8.40	298	293	0.6270
13-Oct-99 15:20:00	7.98	293	294	0.7336	8.47	326	320	0.7047	8.30	297	290	0.6309

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 2

	A Module						B Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**0.00**	**7.81**	**0**	**275**	**47**	**0.07**	**16.26**	**5.70**	**15**	**275**	**108**	**2.00**
13-Oct-99 11:45:00	0.00	7.81	0	268	38	0.07	16.79	5.69	3	268	108	1.99
13-Oct-99 11:50:00	0.00	7.81	0	269	38	0.07	16.77	5.69	0	269	108	1.99
13-Oct-99 11:55:00	0.00	7.81	0	269	39	0.07	16.75	5.69	2	269	107	1.99
13-Oct-99 12:00:00	0.00	7.81	0	269	39	0.07	16.73	5.69	3	269	107	1.99
13-Oct-99 12:05:00	0.00	7.81	0	270	40	0.07	16.71	5.70	119	270	108	1.99
13-Oct-99 12:10:00	0.00	7.81	0	270	40	0.07	16.70	5.70	1	270	108	1.99
13-Oct-99 12:15:00	0.00	7.81	0	270	40	0.07	16.66	5.70	1	270	108	1.99
13-Oct-99 12:20:00	0.00	7.81	0	271	41	0.07	16.56	5.70	3	271	109	1.99
13-Oct-99 12:25:00	0.00	7.81	0	271	41	0.07	16.45	5.70	5	271	109	1.99
13-Oct-99 12:30:00	0.00	7.81	0	271	42	0.07	16.35	5.70	1	271	104	1.99
13-Oct-99 12:35:00	0.00	7.81	0	272	42	0.07	16.25	5.70	0	272	102	1.99
13-Oct-99 12:40:00	0.00	7.81	0	272	42	0.07	16.22	5.70	8	272	107	1.99
13-Oct-99 12:45:00	0.00	7.81	0	272	43	0.07	16.20	5.70	119	272	108	1.99
13-Oct-99 12:50:00	0.00	7.81	0	273	43	0.07	16.18	5.70	0	273	108	1.99
13-Oct-99 12:55:00	0.00	7.81	0	273	44	0.07	16.08	5.70	1	273	108	1.99
13-Oct-99 13:00:00	0.00	7.81	0	273	44	0.07	15.98	5.70	0	273	108	1.99
13-Oct-99 13:05:00	0.00	7.81	0	274	44	0.07	16.07	5.70	3	274	107	1.99
13-Oct-99 13:10:00	0.00	7.81	0	274	45	0.07	16.05	5.70	1	274	107	1.99
13-Oct-99 13:15:00	0.00	7.81	0	274	45	0.07	15.99	5.70	1	274	107	1.99
13-Oct-99 13:20:00	0.00	7.81	0	274	46	0.07	15.94	5.70	52	274	107	1.99
13-Oct-99 13:25:00	0.00	7.81	0	275	46	0.07	15.94	5.70	1	275	105	2.00
13-Oct-99 13:30:00	0.00	7.81	0	275	46	0.07	15.93	5.70	7	275	109	2.00
13-Oct-99 13:35:00	0.00	7.81	0	275	47	0.07	15.93	5.70	114	275	110	2.00
13-Oct-99 13:40:00	0.00	7.81	0	276	47	0.07	15.92	5.70	0	276	111	2.00
13-Oct-99 13:45:00	0.00	7.81	0	276	48	0.07	15.92	5.70	3	276	109	2.00
13-Oct-99 13:50:00	0.00	7.81	0	276	48	0.07	16.03	5.70	1	276	108	2.00
13-Oct-99 13:55:00	0.00	7.81	0	277	48	0.07	16.19	5.70	1	277	108	2.00
13-Oct-99 14:00:00	0.00	7.81	0	277	49	0.07	16.19	5.70	1	277	108	2.00
13-Oct-99 14:05:00	0.00	7.81	0	277	49	0.07	16.18	5.70	0	277	108	2.00
13-Oct-99 14:10:00	0.00	7.81	0	278	50	0.07	16.19	5.70	1	278	109	2.00
13-Oct-99 14:15:00	0.00	7.81	0	278	50	0.07	16.29	5.70	1	278	109	2.00
13-Oct-99 14:20:00	0.00	7.81	0	278	50	0.07	16.39	5.70	5	278	109	2.00
13-Oct-99 14:25:00	0.00	7.81	0	279	51	0.08	16.48	5.70	120	279	109	2.00
13-Oct-99 14:30:00	0.00	7.81	0	279	51	0.08	16.58	5.70	42	279	109	2.00
13-Oct-99 14:35:00	0.00	7.81	0	279	52	0.08	16.67	5.70	1	279	109	2.00
13-Oct-99 14:40:00	0.00	7.81	0	280	52	0.08	16.28	5.71	0	280	109	2.00
13-Oct-99 14:45:00	0.00	7.81	0	280	52	0.08	15.89	5.71	0	280	109	2.00
13-Oct-99 14:50:00	0.00	7.81	0	280	53	0.08	15.87	5.71	1	280	109	2.00
13-Oct-99 14:55:00	0.00	7.81	0	281	53	0.08	15.94	5.71	0	281	109	2.00
13-Oct-99 15:00:00	0.00	7.81	0	281	54	0.08	16.04	5.71	2	281	109	2.00
13-Oct-99 15:05:00	0.00	7.80	0	281	54	0.08	16.16	5.71	1	281	109	2.00
13-Oct-99 15:10:00	0.00	7.80	0	282	54	0.08	16.28	5.71	34	282	109	2.00
13-Oct-99 15:15:00	0.00	7.80	0	282	55	0.08	16.40	5.71	1	282	109	2.00
13-Oct-99 15:20:00	0.00	7.80	0	282	55	0.08	16.49	5.71	1	282	109	2.00

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 2

	C Module						D Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**20.00**	**5.66**	**21.11**	**275**	**119**	**0.00**	**15.97**	**5.67**	**13**	**275**	**109**	**0.00**
13-Oct-99 11:45:00	20.00	5.66	3.55	268	119	0.00	16.19	5.67	1	268	108	0.00
13-Oct-99 11:50:00	20.00	5.66	119.97	269	119	0.00	16.21	5.67	114	269	108	0.00
13-Oct-99 11:55:00	20.00	5.66	0.44	269	119	0.00	16.23	5.67	0	269	108	0.00
13-Oct-99 12:00:00	20.00	5.65	0.36	269	119	0.00	16.25	5.67	0	269	108	0.00
13-Oct-99 12:05:00	20.00	5.65	0.37	270	119	0.00	16.27	5.67	2	270	108	0.00
13-Oct-99 12:10:00	20.00	5.65	1.33	270	119	0.00	16.28	5.67	0	270	108	0.00
13-Oct-99 12:15:00	20.00	5.65	1.41	270	119	0.00	16.16	5.67	1	270	108	0.00
13-Oct-99 12:20:00	20.00	5.65	4.28	271	119	0.00	16.06	5.67	1	271	108	0.00
13-Oct-99 12:25:00	20.00	5.65	119.69	271	119	0.00	16.09	5.67	1	271	108	0.00
13-Oct-99 12:30:00	20.00	5.65	4.60	271	119	0.00	16.12	5.67	1	271	108	0.00
13-Oct-99 12:35:00	20.00	5.65	0.72	272	119	0.00	16.14	5.67	27	272	108	0.00
13-Oct-99 12:40:00	20.00	5.65	0.56	272	119	0.00	16.17	5.67	118	272	108	0.00
13-Oct-99 12:45:00	20.00	5.65	2.30	272	119	0.00	16.20	5.67	0	272	109	0.00
13-Oct-99 12:50:00	20.00	5.65	1.48	273	119	0.00	16.15	5.67	0	273	109	0.00
13-Oct-99 12:55:00	20.00	5.65	119.97	273	119	0.00	16.08	5.67	1	273	109	0.00
13-Oct-99 13:00:00	20.00	5.65	0.18	273	119	0.00	16.01	5.67	1	273	109	0.00
13-Oct-99 13:05:00	20.00	5.65	0.34	274	119	0.00	15.95	5.67	0	274	109	0.00
13-Oct-99 13:10:00	20.00	5.65	2.08	274	119	0.00	15.95	5.67	0	274	109	0.00
13-Oct-99 13:15:00	20.00	5.65	0.46	274	119	0.00	15.96	5.67	0	274	109	0.00
13-Oct-99 13:20:00	20.00	5.65	2.57	274	119	0.00	15.97	5.67	1	274	109	0.00
13-Oct-99 13:25:00	20.00	5.65	1.35	275	119	0.00	15.98	5.67	1	275	109	0.00
13-Oct-99 13:30:00	20.00	5.65	119.35	275	119	0.00	15.92	5.67	1	275	109	0.00
13-Oct-99 13:35:00	20.00	5.65	2.47	275	119	0.00	15.85	5.67	4	275	109	0.00
13-Oct-99 13:40:00	20.00	5.65	0.31	276	119	0.00	15.77	5.67	118	276	109	0.00
13-Oct-99 13:45:00	20.00	5.66	1.34	276	119	0.00	15.69	5.67	0	276	109	0.00
13-Oct-99 13:50:00	20.00	5.66	3.20	276	119	0.00	15.71	5.67	0	276	109	0.00
13-Oct-99 13:55:00	20.00	5.66	1.67	277	119	0.00	15.84	5.67	0	277	109	0.00
13-Oct-99 14:00:00	20.00	5.66	61.40	277	119	0.00	15.97	5.67	0	277	109	0.00
13-Oct-99 14:05:00	20.00	5.66	83.52	277	119	0.00	15.96	5.67	1	277	109	0.00
13-Oct-99 14:10:00	20.00	5.66	0.41	278	119	0.00	15.83	5.67	2	278	109	0.00
13-Oct-99 14:15:00	20.00	5.66	0.87	278	119	0.00	15.73	5.67	2	278	109	0.00
13-Oct-99 14:20:00	20.00	5.66	1.29	278	119	0.00	15.75	5.67	1	278	109	0.00
13-Oct-99 14:25:00	20.00	5.66	2.27	279	119	0.00	15.78	5.67	0	279	109	0.00
13-Oct-99 14:30:00	20.00	5.66	8.90	279	119	0.00	15.81	5.67	1	279	109	0.00
13-Oct-99 14:35:00	20.00	5.66	119.97	279	119	0.00	15.84	5.67	1	279	109	0.00
13-Oct-99 14:40:00	20.00	5.66	0.43	280	119	0.00	15.86	5.67	120	280	109	0.00
13-Oct-99 14:45:00	20.00	5.66	1.65	280	119	0.00	15.89	5.68	45	280	109	0.00
13-Oct-99 14:50:00	20.00	5.66	1.78	280	119	0.00	15.92	5.68	0	280	109	0.00
13-Oct-99 14:55:00	20.00	5.66	3.43	281	119	0.00	15.94	5.68	0	281	109	0.00
13-Oct-99 15:00:00	20.00	5.66	2.98	281	119	0.00	15.97	5.68	1	281	109	0.00
13-Oct-99 15:05:00	20.00	5.66	119.55	281	119	0.00	15.95	5.68	1	281	109	0.00
13-Oct-99 15:10:00	20.00	5.67	0.29	282	119	0.00	15.89	5.68	1	282	109	0.00
13-Oct-99 15:15:00	20.00	5.67	1.43	282	119	0.00	15.84	5.68	0	282	110	0.00
13-Oct-99 15:20:00	20.00	5.67	2.30	282	119	0.00	15.78	5.68	2	282	110	0.00

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 2

	E Module						F Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**0.00**	**4.00**	**0**	**275**	**64**	**0.00**	**14.53**	**5.67**	**13**	**275**	**107**	**1.96**
13-Oct-99 11:45:00	0.00	4.00	0	268	63	0.00	14.74	5.67	0	268	106	1.94
13-Oct-99 11:50:00	0.00	4.00	0	269	63	0.00	14.73	5.67	0	269	106	1.94
13-Oct-99 11:55:00	0.00	4.00	0	269	63	0.00	14.72	5.67	0	269	106	1.93
13-Oct-99 12:00:00	0.00	4.00	0	269	63	0.00	14.71	5.67	0	269	106	1.94
13-Oct-99 12:05:00	0.00	4.00	0	270	63	0.00	14.70	5.67	6	270	106	1.95
13-Oct-99 12:10:00	0.00	4.00	0	270	63	0.00	14.70	5.67	120	270	106	1.96
13-Oct-99 12:15:00	0.00	4.00	0	270	63	0.00	14.69	5.67	0	270	106	1.94
13-Oct-99 12:20:00	0.00	4.00	0	271	63	0.00	14.68	5.67	1	271	106	1.95
13-Oct-99 12:25:00	0.00	4.00	0	271	63	0.00	14.67	5.67	0	271	106	1.97
13-Oct-99 12:30:00	0.00	4.00	0	271	63	0.00	14.66	5.67	1	271	106	1.95
13-Oct-99 12:35:00	0.00	4.00	0	272	63	0.00	14.65	5.67	4	272	106	1.95
13-Oct-99 12:40:00	0.00	4.00	0	272	63	0.00	14.65	5.67	1	272	106	1.97
13-Oct-99 12:45:00	0.00	4.00	0	272	63	0.00	14.64	5.67	1	272	106	1.96
13-Oct-99 12:50:00	0.00	4.00	0	273	63	0.00	14.63	5.67	1	273	107	1.94
13-Oct-99 12:55:00	0.00	4.00	0	273	63	0.00	14.62	5.67	0	273	107	1.95
13-Oct-99 13:00:00	0.00	4.00	0	273	64	0.00	14.61	5.67	0	273	107	1.96
13-Oct-99 13:05:00	0.00	4.00	0	274	64	0.00	14.60	5.67	0	274	107	1.97
13-Oct-99 13:10:00	0.00	4.00	0	274	64	0.00	14.59	5.67	1	274	107	1.94
13-Oct-99 13:15:00	0.00	4.00	0	274	64	0.00	14.59	5.67	0	274	107	1.97
13-Oct-99 13:20:00	0.00	4.00	0	274	64	0.00	14.58	5.67	1	274	107	1.96
13-Oct-99 13:25:00	0.00	4.00	0	275	64	0.00	14.57	5.67	1	275	107	1.95
13-Oct-99 13:30:00	0.00	4.00	0	275	64	0.00	14.56	5.67	15	275	107	1.96
13-Oct-99 13:35:00	0.00	4.00	0	275	64	0.00	14.55	5.67	120	275	107	1.96
13-Oct-99 13:40:00	0.00	4.00	0	276	64	0.00	14.54	5.67	0	276	107	1.97
13-Oct-99 13:45:00	0.00	4.00	0	276	65	0.00	14.53	5.67	0	276	107	1.98
13-Oct-99 13:50:00	0.00	4.00	0	276	65	0.00	14.52	5.67	0	276	107	1.97
13-Oct-99 13:55:00	0.00	4.00	0	277	65	0.00	14.51	5.67	4	277	107	1.96
13-Oct-99 14:00:00	0.00	4.00	0	277	65	0.00	14.49	5.67	1	277	107	1.96
13-Oct-99 14:05:00	0.00	4.00	0	277	65	0.00	14.47	5.67	15	277	108	1.96
13-Oct-99 14:10:00	0.00	4.00	0	278	65	0.00	14.46	5.67	117	278	108	1.97
13-Oct-99 14:15:00	0.00	4.00	0	278	65	0.00	14.44	5.67	1	278	108	1.98
13-Oct-99 14:20:00	0.00	4.00	0	278	65	0.00	14.43	5.67	0	278	108	1.97
13-Oct-99 14:25:00	0.00	4.00	0	279	65	0.00	14.41	5.67	0	279	108	1.98
13-Oct-99 14:30:00	0.00	4.00	0	279	65	0.00	14.39	5.67	2	279	108	1.99
13-Oct-99 14:35:00	0.00	4.00	0	279	66	0.00	14.38	5.67	0	279	108	2.00
13-Oct-99 14:40:00	0.00	4.00	0	280	66	0.00	14.36	5.67	1	280	108	1.98
13-Oct-99 14:45:00	0.00	4.00	0	280	66	0.00	14.35	5.67	0	280	107	1.97
13-Oct-99 14:50:00	0.00	4.00	0	280	66	0.00	14.33	5.67	3	280	107	1.97
13-Oct-99 14:55:00	0.00	4.00	0	281	66	0.00	14.31	5.67	1	281	107	1.97
13-Oct-99 15:00:00	0.00	4.00	0	281	66	0.00	14.30	5.67	40	281	106	1.97
13-Oct-99 15:05:00	0.00	4.00	0	281	66	0.00	14.28	5.67	120	281	106	1.97
13-Oct-99 15:10:00	0.00	4.00	0	282	66	0.00	14.27	5.67	0	282	106	1.97
13-Oct-99 15:15:00	0.00	4.00	0	282	66	0.00	14.25	5.67	1	282	106	1.97
13-Oct-99 15:20:00	0.00	4.00	0	282	67	0.00	14.24	5.67	0	282	105	1.97

INTERMOUTAIN GENERATING STATION UNIT 2
CEMS DATA FOR RUN 2

	Unit Two Stack		
Timestamp	SO2 ppm (wet)	NOx ppm (wet)	CO2 % (wet)
Average	**20.9**	**253**	**13.16**
10/13/99 11:45	21.2	249	13.24
10/13/99 12:00	20.7	251	13.24
10/13/99 12:15	20.5	254	13.24
10/13/99 12:30	21.0	254	13.27
10/13/99 12:45	20.8	250	13.16
10/13/99 13:00	20.8	254	13.17
10/13/99 13:15	21.0	254	13.17
10/13/99 13:30	21.2	256	13.18
10/13/99 13:45	21.1	255	13.14
10/13/99 14:00	20.8	255	13.13
10/13/99 14:15	20.9	256	13.13
10/13/99 14:30	21.3	255	13.12
10/13/99 14:45	20.6	254	13.10
10/13/99 15:00	20.7	252	13.11
10/13/99 15:15	20.9	250	13.08
10/13/99 15:30	20.4	248	13.04

INTERMOUTAIN GENERATING STATION UNIT 2
OPACITY DATA FOR RUN 2

Timestamp		Unit Two Stack Opacity %
Average		**3.2**
10/13/99	11:42	3.0
10/13/99	11:48	3.0
10/13/99	11:54	3.0
10/13/99	12:00	3.0
10/13/99	12:06	3.0
10/13/99	12:12	3.0
10/13/99	12:18	3.0
10/13/99	12:24	3.0
10/13/99	12:30	3.0
10/13/99	12:36	3.0
10/13/99	12:42	4.0
10/13/99	12:48	3.0
10/13/99	12:54	3.0
10/13/99	13:00	3.0
10/13/99	13:06	3.0
10/13/99	13:12	3.0
10/13/99	13:18	3.0
10/13/99	13:24	3.0
10/13/99	13:30	3.0
10/13/99	13:36	4.0
10/13/99	13:42	3.0
10/13/99	13:48	3.0
10/13/99	13:54	3.0
10/13/99	14:00	3.0
10/13/99	14:06	3.0
10/13/99	14:12	3.0
10/13/99	14:18	4.0
10/13/99	14:24	3.0
10/13/99	14:30	3.0
10/13/99	14:36	3.0
10/13/99	14:42	3.0
10/13/99	14:48	3.0
10/13/99	14:54	3.0
10/13/99	15:00	4.0
10/13/99	15:06	4.0
10/13/99	15:12	4.0
10/13/99	15:18	4.0
10/13/99	15:24	3.0

INTERMOUTAIN GENERATING STATION UNIT 2 BOILER OPERATING DATA FOR RUN 3

	Coal Feed Rate	enerator Outp	Steam Gen. Rate	No. of Burners Firing (Pulverizers inservice)								Excess O2
	Tons Totalized	MW Gross	lbs/hr. X1000	A	B	C	D	E	F	G	H	%
Timestamp	2COAXI185A	2TGBPK0022	2FWAFT0025	2SGAES0005	2SGAES0006	2SGAES0007	2SGAES0008	2SGAES0009	2SGAES0010	2SGAES0011	2SGAES0012	2INAKV0061
Average	**334**	**875**	**6148**	**ON**	**ON**	**ON**	**OFF**	**ON**	**ON**	**ON**	**ON**	**2.75**
13-Oct-99 17:30:00	180441	874	6,159	ON	ON	ON	OFF	ON	ON	ON	ON	2.77
13-Oct-99 17:35:00	180468	874	6,161	ON	ON	ON	OFF	ON	ON	ON	ON	2.77
13-Oct-99 17:40:00	180496	877	6,140	ON	ON	ON	OFF	ON	ON	ON	ON	2.86
13-Oct-99 17:45:00	180524	877	6,154	ON	ON	ON	OFF	ON	ON	ON	ON	2.97
13-Oct-99 17:50:00	180552	875	6,157	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 17:55:00	180580	873	6,196	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:00:00	180607	874	6,144	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:05:00	180635	876	6,155	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:10:00	180663	876	6,130	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:15:00	180691	872	6,119	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:20:00	180719	875	6,181	ON	ON	ON	OFF	ON	ON	ON	ON	2.73
13-Oct-99 18:25:00	180746	875	6,162	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
13-Oct-99 18:30:00	180774	877	6,141	ON	ON	ON	OFF	ON	ON	ON	ON	2.76
13-Oct-99 18:35:00	180802	872	6,202	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
13-Oct-99 18:40:00	180830	875	6,148	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
13-Oct-99 18:45:00	180857	876	6,236	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
13-Oct-99 18:50:00	180885	872	6,167	ON	ON	ON	OFF	ON	ON	ON	ON	2.79
13-Oct-99 18:55:00	180913	877	6,145	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
13-Oct-99 19:00:00	180941	873	6,201	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
13-Oct-99 19:05:00	180968	875	6,068	ON	ON	ON	OFF	ON	ON	ON	ON	2.77
13-Oct-99 19:10:00	180997	875	6,140	ON	ON	ON	OFF	ON	ON	ON	ON	2.76
13-Oct-99 19:15:00	181024	875	6,201	ON	ON	ON	OFF	ON	ON	ON	ON	2.76
13-Oct-99 19:20:00	181052	873	6,126	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
13-Oct-99 19:25:00	181080	874	6,130	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
13-Oct-99 19:30:00	181108	876	6,151	ON	ON	ON	OFF	ON	ON	ON	ON	2.74
13-Oct-99 19:35:00	181136	873	6,120	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
13-Oct-99 19:40:00	181164	874	6,137	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
13-Oct-99 19:45:00	181192	875	6,132	ON	ON	ON	OFF	ON	ON	ON	ON	2.67
13-Oct-99 19:50:00	181219	875	6,164	ON	ON	ON	OFF	ON	ON	ON	ON	2.68
13-Oct-99 19:55:00	181247	873	6,131	ON	ON	ON	OFF	ON	ON	ON	ON	2.68
13-Oct-99 20:00:00	181275	875	6,132	ON	ON	ON	OFF	ON	ON	ON	ON	2.68
13-Oct-99 20:05:00	181303	876	6,123	ON	ON	ON	OFF	ON	ON	ON	ON	2.69
13-Oct-99 20:10:00	181331	874	6,070	ON	ON	ON	OFF	ON	ON	ON	ON	2.69
13-Oct-99 20:15:00	181358	875	6,122	ON	ON	ON	OFF	ON	ON	ON	ON	2.69
13-Oct-99 20:20:00	181386	876	6,117	ON	ON	ON	OFF	ON	ON	ON	ON	2.69
13-Oct-99 20:25:00	181414	875	6,137	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
13-Oct-99 20:30:00	181442	878	6,128	ON	ON	ON	OFF	ON	ON	ON	ON	2.79
13-Oct-99 20:35:00	181470	876	6,148	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
13-Oct-99 20:40:00	181497	874	6,148	ON	ON	ON	OFF	ON	ON	ON	ON	2.77
13-Oct-99 20:45:00	181525	875	6,140	ON	ON	ON	OFF	ON	ON	ON	ON	2.76
13-Oct-99 20:50:00	181553	876	6,167	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
13-Oct-99 20:55:00	181581	874	6,132	ON	ON	ON	OFF	ON	ON	ON	ON	2.74
13-Oct-99 21:00:00	181609	875	6,184	ON	ON	ON	OFF	ON	ON	ON	ON	2.73

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER OPERATING DATA SUMMARY FOR RUN 3

	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Casing A	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033
Average	**7.56**	**289**	**294**	**0.5856**
Casing B	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037
Average	**7.99**	**322**	**315**	**0.7184**
Casing C	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**7.76**	**295**	**289**	**0.5922**
Average/Total	**7.77**	**302**	**300**	**1.896**

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER OPERATING DATA FOR RUN 3

	A Casing Fabric Filter				B Casing Fabric Filter				C Casing Fabric Filter			
	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Timestamp	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**7.56**	**289**	**294**	**0.59**	**7.99**	**322**	**315**	**0.7184**	**7.76**	**295**	**289**	**0.5922**
13-Oct-99 17:30:00	7.60	289	291	0.6371	8.13	320	313	0.7211	7.83	293	288	0.6602
13-Oct-99 17:35:00	7.61	289	291	0.5723	8.05	320	314	0.7067	7.59	293	285	0.5664
13-Oct-99 17:40:00	7.50	289	291	0.5422	7.92	320	314	0.7770	7.60	294	287	0.5645
13-Oct-99 17:45:00	7.46	289	291	0.4524	7.79	320	313	0.7711	7.49	294	285	0.6303
13-Oct-99 17:50:00	7.27	289	291	0.3930	7.68	321	313	0.6020	7.70	294	289	0.5996
13-Oct-99 17:55:00	7.28	290	291	0.5897	7.81	321	314	0.6215	7.55	295	290	0.5957
13-Oct-99 18:00:00	7.57	288	291	0.5746	7.98	321	315	0.6805	7.59	295	289	0.5943
13-Oct-99 18:05:00	7.62	288	293	0.6707	8.09	322	315	0.7473	7.76	295	286	0.5783
13-Oct-99 18:10:00	7.73	289	293	0.5832	8.14	322	314	0.6438	7.93	295	289	0.6348
13-Oct-99 18:15:00	7.57	289	293	0.5715	8.04	323	315	0.7875	7.78	295	288	0.5457
13-Oct-99 18:20:00	7.51	289	294	0.4891	8.03	323	316	0.6301	7.67	296	289	0.5235
13-Oct-99 18:25:00	7.51	289	294	0.6145	8.04	324	314	0.7625	7.75	297	291	0.6106
13-Oct-99 18:30:00	7.28	289	294	0.5512	7.98	324	315	0.6930	7.87	297	289	0.6494
13-Oct-99 18:35:00	7.62	289	295	0.6215	8.07	324	314	0.6922	8.00	297	290	0.5757
13-Oct-99 18:40:00	7.53	289	295	0.5133	8.13	324	316	0.7590	7.99	296	291	0.5996
13-Oct-99 18:45:00	7.51	289	295	0.6196	8.02	324	315	0.6512	7.86	296	292	0.6088
13-Oct-99 18:50:00	7.47	289	295	0.6199	7.97	323	316	0.7516	7.74	296	290	0.6336
13-Oct-99 18:55:00	7.29	289	295	0.6299	7.98	323	315	0.7242	7.61	297	289	0.6285
13-Oct-99 19:00:00	7.32	290	295	0.5977	7.74	323	316	0.7239	7.63	295	292	0.4688
13-Oct-99 19:05:00	7.79	290	295	0.6629	8.16	323	316	0.6961	7.70	295	289	0.5638
13-Oct-99 19:10:00	7.65	290	295	0.5281	8.14	323	316	0.7922	7.87	296	290	0.5877
13-Oct-99 19:15:00	7.68	289	295	0.7110	8.04	323	317	0.5891	8.03	295	289	0.6528
13-Oct-99 19:20:00	7.54	289	295	0.6778	8.12	323	315	0.7955	7.77	295	290	0.4965
13-Oct-99 19:25:00	7.62	289	295	0.5293	7.96	323	315	0.8066	7.67	295	291	0.6184
13-Oct-99 19:30:00	7.66	289	295	0.6668	7.95	323	317	0.7567	7.81	295	288	0.6070
13-Oct-99 19:35:00	7.66	290	295	0.5809	8.04	322	315	0.7004	7.92	295	292	0.5633
13-Oct-99 19:40:00	7.61	290	295	0.6024	7.92	322	317	0.6942	7.88	295	289	0.6133
13-Oct-99 19:45:00	7.88	290	295	0.5751	8.10	322	317	0.7844	7.85	295	289	0.5852
13-Oct-99 19:50:00	7.49	290	295	0.5289	7.97	322	316	0.6535	7.82	296	292	0.6524
13-Oct-99 19:55:00	7.47	290	295	0.6371	7.86	322	316	0.6879	7.67	294	290	0.5774
13-Oct-99 20:00:00	7.38	290	295	0.5996	7.78	322	317	0.7317	7.63	295	289	0.4449
13-Oct-99 20:05:00	7.28	290	295	0.5559	7.93	322	317	0.7655	7.79	294	291	0.5883
13-Oct-99 20:10:00	7.59	290	295	0.6305	8.07	322	315	0.7090	8.05	294	291	0.6070
13-Oct-99 20:15:00	7.69	290	295	0.6133	8.40	322	315	0.7992	8.31	294	292	0.6028
13-Oct-99 20:20:00	7.72	290	294	0.5895	8.11	322	316	0.6766	7.76	293	291	0.5289
13-Oct-99 20:25:00	7.71	290	294	0.5633	8.06	322	314	0.7074	7.64	294	288	0.5488
13-Oct-99 20:30:00	7.59	290	294	0.6164	8.12	322	316	0.6641	7.88	295	288	0.6430
13-Oct-99 20:35:00	7.50	290	294	0.5985	7.81	322	314	0.6555	7.59	295	291	0.6469
13-Oct-99 20:40:00	7.70	290	294	0.6426	7.97	322	316	0.7602	7.61	296	288	0.5871
13-Oct-99 20:45:00	7.72	290	294	0.5348	7.96	322	315	0.7895	7.57	296	291	0.6070
13-Oct-99 20:50:00	7.66	290	294	0.6309	7.95	322	316	0.7360	7.60	296	289	0.6028
13-Oct-99 20:55:00	7.73	290	294	0.6477	7.92	322	316	0.7160	7.59	296	288	0.6211
13-Oct-99 21:00:00	7.61	290	294	0.4145	7.81	322	315	0.7766	7.65	296	288	0.6492

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA SUMMARY FOR RUN 3

	A Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
A Module	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
B Module	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**16.28**	**5.71**	**14**	**278**	**109**	**2.00**
C Module	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006
Average	**20.00**	**5.69**	**17**	**278**	**119**	**NC**
D Module	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**15.54**	**5.69**	**17**	**278**	**108**	**NC**
E Module	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
F Module	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**14.32**	**5.68**	**11**	**278**	**106**	**1.97**
Average/Total	**16.53**	**5.69**	**59**	**278**	**111**	**1.99**

NA - not applicable, module not operational
NC - not included in calculation of average. Assumed pressure sensor was inoperational during testing.

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 3

	A Module						B Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**0.00**	**7.79**	**0**	**278**	**62**	**0.08**	**16.28**	**5.71**	**14**	**278**	**109**	**2.00**
13-Oct-99 17:30:00	0.00	7.80	0	280	62	0.08	16.02	5.71	2	280	108	2.00
13-Oct-99 17:35:00	0.00	7.80	0	280	62	0.08	15.85	5.71	0	280	108	2.00
13-Oct-99 17:40:00	0.00	7.79	0	280	62	0.08	16.22	5.71	3	280	108	2.00
13-Oct-99 17:45:00	0.00	7.79	0	280	62	0.08	16.09	5.71	0	280	108	2.00
13-Oct-99 17:50:00	0.00	7.79	0	280	62	0.08	15.97	5.71	0	280	108	2.00
13-Oct-99 17:55:00	0.00	7.79	0	280	62	0.08	15.84	5.71	15	280	109	2.00
13-Oct-99 18:00:00	0.00	7.79	0	280	62	0.08	15.72	5.71	118	280	109	2.00
13-Oct-99 18:05:00	0.00	7.79	0	279	62	0.08	15.77	5.71	0	279	109	2.00
13-Oct-99 18:10:00	0.00	7.79	0	279	62	0.08	16.09	5.71	2	279	109	2.00
13-Oct-99 18:15:00	0.00	7.79	0	279	62	0.08	16.51	5.71	116	279	109	2.00
13-Oct-99 18:20:00	0.00	7.79	0	279	62	0.08	16.36	5.71	44	279	109	2.00
13-Oct-99 18:25:00	0.00	7.79	0	279	62	0.08	16.32	5.71	0	279	109	2.00
13-Oct-99 18:30:00	0.00	7.79	0	279	62	0.09	16.33	5.71	1	279	109	2.00
13-Oct-99 18:35:00	0.00	7.79	0	279	62	0.09	16.33	5.71	2	279	109	2.00
13-Oct-99 18:40:00	0.00	7.79	0	279	62	0.09	16.34	5.71	3	279	109	2.00
13-Oct-99 18:45:00	0.00	7.79	0	279	62	0.09	16.35	5.71	1	279	109	2.00
13-Oct-99 18:50:00	0.00	7.79	0	279	62	0.09	16.37	5.71	1	279	110	2.00
13-Oct-99 18:55:00	0.00	7.79	0	279	62	0.09	16.38	5.71	2	279	110	2.00
13-Oct-99 19:00:00	0.00	7.79	0	279	62	0.09	16.33	5.71	1	279	110	2.00
13-Oct-99 19:05:00	0.00	7.79	0	279	62	0.09	16.09	5.71	1	279	110	2.00
13-Oct-99 19:10:00	0.00	7.79	0	278	62	0.09	16.00	5.71	36	278	110	2.00
13-Oct-99 19:15:00	0.00	7.79	0	278	62	0.09	16.22	5.71	92	278	110	2.00
13-Oct-99 19:20:00	0.00	7.79	0	278	62	0.09	16.44	5.71	1	278	110	2.00
13-Oct-99 19:25:00	0.00	7.79	0	278	62	0.08	16.62	5.71	0	278	110	2.00
13-Oct-99 19:30:00	0.00	7.79	0	278	62	0.08	16.61	5.71	0	278	110	2.00
13-Oct-99 19:35:00	0.00	7.79	0	278	62	0.08	16.51	5.71	3	278	110	2.00
13-Oct-99 19:40:00	0.00	7.79	0	278	62	0.08	16.41	5.71	1	278	110	2.00
13-Oct-99 19:45:00	0.00	7.79	0	278	62	0.08	16.41	5.71	1	278	110	2.00
13-Oct-99 19:50:00	0.00	7.79	0	278	62	0.08	16.44	5.71	4	278	110	2.00
13-Oct-99 19:55:00	0.00	7.79	0	278	62	0.08	16.48	5.71	4	278	110	2.00
13-Oct-99 20:00:00	0.00	7.79	0	278	62	0.08	16.47	5.71	1	278	110	2.00
13-Oct-99 20:05:00	0.00	7.79	0	278	62	0.08	16.46	5.71	1	278	110	2.00
13-Oct-99 20:10:00	0.00	7.79	0	278	62	0.08	16.45	5.71	0	278	110	2.00
13-Oct-99 20:15:00	0.00	7.79	0	278	62	0.08	16.40	5.71	1	278	110	2.00
13-Oct-99 20:20:00	0.00	7.78	0	277	62	0.08	16.24	5.71	1	277	109	2.00
13-Oct-99 20:25:00	0.00	7.78	0	277	62	0.08	16.01	5.71	0	277	109	2.00
13-Oct-99 20:30:00	0.00	7.78	0	277	61	0.08	15.91	5.71	1	277	109	2.00
13-Oct-99 20:35:00	0.00	7.78	0	277	61	0.08	16.00	5.71	1	277	109	2.00
13-Oct-99 20:40:00	0.00	7.78	0	277	61	0.08	16.26	5.71	2	277	108	2.00
13-Oct-99 20:45:00	0.00	7.78	0	277	61	0.08	16.36	5.71	13	277	108	2.00
13-Oct-99 20:50:00	0.00	7.78	0	277	60	0.08	16.46	5.71	114	277	108	2.00
13-Oct-99 20:55:00	0.00	7.78	0	277	60	0.08	16.57	5.71	0	277	108	2.00
13-Oct-99 21:00:00	0.00	7.78	0	277	60	0.08	16.88	5.71	1	277	108	2.00

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 3

	C Module						D Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**20.00**	**5.69**	**17.45**	**278**	**119**	**0.00**	**15.54**	**5.69**	**17**	**278**	**108**	**0.00**
13-Oct-99 17:30:00	20.00	5.68	4.48	280	119	0.00	15.66	5.68	0	280	109	0.00
13-Oct-99 17:35:00	20.00	5.68	0.97	280	119	0.00	15.68	5.68	1	280	108	0.00
13-Oct-99 17:40:00	20.00	5.68	119.62	280	119	0.00	15.67	5.68	0	280	108	0.00
13-Oct-99 17:45:00	20.00	5.68	0.29	280	119	0.00	15.52	5.68	1	280	108	0.00
13-Oct-99 17:50:00	20.00	5.68	0.90	280	119	0.00	15.36	5.68	0	280	108	0.00
13-Oct-99 17:55:00	20.00	5.69	2.50	280	119	0.00	15.37	5.68	1	280	108	0.00
13-Oct-99 18:00:00	20.00	5.69	0.73	280	119	0.00	15.39	5.68	14	280	108	0.00
13-Oct-99 18:05:00	20.00	5.69	0.92	279	119	0.00	15.41	5.68	115	279	108	0.00
13-Oct-99 18:10:00	20.00	5.69	0.71	279	119	0.00	15.42	5.68	0	279	108	0.00
13-Oct-99 18:15:00	20.00	5.69	0.50	279	119	0.00	15.44	5.68	0	279	108	0.00
13-Oct-99 18:20:00	20.00	5.69	0.29	279	119	0.00	15.45	5.68	1	279	108	0.00
13-Oct-99 18:25:00	20.00	5.69	1.20	279	119	0.00	15.47	5.68	0	279	108	0.00
13-Oct-99 18:30:00	20.00	5.69	1.21	279	119	0.00	15.49	5.68	0	279	108	0.00
13-Oct-99 18:35:00	20.00	5.69	1.99	279	119	0.00	15.46	5.68	1	279	108	0.00
13-Oct-99 18:40:00	20.00	5.69	2.62	279	119	0.00	15.35	5.68	1	279	108	0.00
13-Oct-99 18:45:00	20.00	5.69	119.97	279	119	0.00	15.29	5.68	1	279	108	0.00
13-Oct-99 18:50:00	20.00	5.69	1.26	279	119	0.00	15.60	5.69	1	279	108	0.00
13-Oct-99 18:55:00	20.00	5.69	0.66	279	119	0.00	15.74	5.69	60	279	108	0.00
13-Oct-99 19:00:00	20.00	5.69	0.51	279	119	0.00	15.71	5.69	111	279	108	0.00
13-Oct-99 19:05:00	20.00	5.69	1.65	279	119	0.00	15.69	5.69	0	279	108	0.00
13-Oct-99 19:10:00	20.00	5.69	4.29	278	119	0.00	15.66	5.69	0	278	108	0.00
13-Oct-99 19:15:00	20.00	5.69	119.97	278	119	0.00	15.64	5.69	0	278	108	0.00
13-Oct-99 19:20:00	20.00	5.70	74.47	278	119	0.00	15.61	5.69	1	278	108	0.00
13-Oct-99 19:25:00	20.00	5.70	0.40	278	119	0.00	15.59	5.69	0	278	108	0.00
13-Oct-99 19:30:00	20.00	5.70	1.72	278	119	0.00	15.56	5.69	1	278	108	0.00
13-Oct-99 19:35:00	20.00	5.70	3.28	278	119	0.00	15.59	5.69	1	278	108	0.00
13-Oct-99 19:40:00	20.00	5.70	3.56	278	119	0.00	15.66	5.69	1	278	108	0.00
13-Oct-99 19:45:00	20.00	5.70	5.51	278	119	0.00	15.71	5.69	3	278	108	0.01
13-Oct-99 19:50:00	20.00	5.70	119.04	278	119	0.00	15.71	5.69	120	278	108	0.01
13-Oct-99 19:55:00	20.00	5.70	1.21	278	119	0.00	15.72	5.69	72	278	108	0.01
13-Oct-99 20:00:00	20.00	5.70	3.53	278	119	0.00	15.70	5.69	0	278	108	0.01
13-Oct-99 20:05:00	20.00	5.70	2.96	278	119	0.00	15.66	5.69	0	278	108	0.01
13-Oct-99 20:10:00	20.00	5.70	2.40	278	119	0.00	15.62	5.69	0	278	108	0.01
13-Oct-99 20:15:00	20.00	5.70	0.64	278	119	0.00	15.58	5.69	0	278	108	0.01
13-Oct-99 20:20:00	20.00	5.70	4.18	277	119	0.00	15.54	5.69	1	277	108	0.01
13-Oct-99 20:25:00	20.00	5.70	2.01	277	119	0.00	15.51	5.69	1	277	108	0.01
13-Oct-99 20:30:00	20.00	5.70	119.97	277	119	0.00	15.49	5.69	1	277	108	0.01
13-Oct-99 20:35:00	20.00	5.70	0.26	277	119	0.00	15.47	5.69	1	277	108	0.01
13-Oct-99 20:40:00	20.00	5.71	1.85	277	119	0.00	15.44	5.69	4	277	108	0.01
13-Oct-99 20:45:00	20.00	5.71	0.93	277	119	0.00	15.42	5.69	120	277	108	0.01
13-Oct-99 20:50:00	20.00	5.71	2.80	277	119	0.00	15.40	5.69	75	277	108	0.01
13-Oct-99 20:55:00	20.00	5.71	1.42	277	119	0.00	15.38	5.69	0	277	108	0.01
13-Oct-99 21:00:00	20.00	5.71	10.81	277	119	0.00	15.37	5.69	0	277	108	0.02

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 3

	E Module						F Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**0.00**	**4.00**	**0**	**278**	**72**	**0.00**	**14.32**	**5.68**	**11**	**278**	**106**	**1.97**
13-Oct-99 17:30:00	0.00	4.00	0	280	69	0.00	14.24	5.68	0	280	107	1.97
13-Oct-99 17:35:00	0.00	4.00	0	280	70	0.00	14.24	5.68	0	280	107	1.97
13-Oct-99 17:40:00	0.00	4.00	0	280	70	0.00	14.24	5.68	0	280	107	1.98
13-Oct-99 17:45:00	0.00	4.00	0	280	70	0.00	14.24	5.68	1	280	107	1.98
13-Oct-99 17:50:00	0.00	4.00	0	280	70	0.00	14.24	5.68	3	280	107	1.97
13-Oct-99 17:55:00	0.00	4.00	0	280	70	0.00	14.24	5.68	2	280	107	1.97
13-Oct-99 18:00:00	0.00	4.00	0	280	70	0.00	14.24	5.68	0	280	107	1.97
13-Oct-99 18:05:00	0.00	4.00	0	279	70	0.00	14.24	5.68	1	279	106	1.96
13-Oct-99 18:10:00	0.00	4.00	0	279	70	0.00	14.24	5.68	8	279	106	1.96
13-Oct-99 18:15:00	0.00	4.00	0	279	70	0.00	14.25	5.68	16	279	106	1.96
13-Oct-99 18:20:00	0.00	4.00	0	279	71	0.00	14.25	5.68	120	279	106	1.98
13-Oct-99 18:25:00	0.00	4.00	0	279	71	0.00	14.26	5.68	0	279	106	1.98
13-Oct-99 18:30:00	0.00	4.00	0	279	71	0.00	14.26	5.68	0	279	106	1.97
13-Oct-99 18:35:00	0.00	4.00	0	279	71	0.00	14.27	5.68	0	279	106	1.97
13-Oct-99 18:40:00	0.00	4.00	0	279	71	0.00	14.28	5.68	0	279	106	1.97
13-Oct-99 18:45:00	0.00	4.00	0	279	71	0.00	14.28	5.68	1	279	106	1.97
13-Oct-99 18:50:00	0.00	4.00	0	279	71	0.00	14.29	5.68	1	279	106	1.97
13-Oct-99 18:55:00	0.00	4.00	0	279	71	0.00	14.29	5.68	0	279	106	1.97
13-Oct-99 19:00:00	0.00	4.00	0	279	71	0.00	14.30	5.68	0	279	106	1.97
13-Oct-99 19:05:00	0.00	4.00	0	279	72	0.00	14.30	5.68	2	279	106	1.97
13-Oct-99 19:10:00	0.00	4.00	0	278	72	0.00	14.31	5.68	3	278	106	1.97
13-Oct-99 19:15:00	0.00	4.00	0	278	72	0.00	14.31	5.68	0	278	106	1.97
13-Oct-99 19:20:00	0.00	4.00	0	278	72	0.00	14.32	5.68	11	278	106	1.97
13-Oct-99 19:25:00	0.00	4.00	0	278	72	0.00	14.32	5.68	118	278	105	1.97
13-Oct-99 19:30:00	0.00	4.00	0	278	72	0.00	14.33	5.68	0	278	105	1.97
13-Oct-99 19:35:00	0.00	4.00	0	278	72	0.00	14.33	5.68	0	278	105	1.97
13-Oct-99 19:40:00	0.00	4.00	0	278	72	0.00	14.34	5.68	0	278	105	1.97
13-Oct-99 19:45:00	0.00	4.00	0	278	72	0.00	14.35	5.68	2	278	105	1.97
13-Oct-99 19:50:00	0.00	4.00	0	278	73	0.00	14.35	5.68	0	278	105	2.00
13-Oct-99 19:55:00	0.00	4.00	0	278	73	0.00	14.36	5.68	0	278	105	1.99
13-Oct-99 20:00:00	0.00	4.00	0	278	73	0.00	14.36	5.68	0	278	105	1.99
13-Oct-99 20:05:00	0.00	4.00	0	278	73	0.00	14.37	5.68	2	278	105	1.98
13-Oct-99 20:10:00	0.00	4.00	0	278	73	0.00	14.37	5.68	0	278	105	1.98
13-Oct-99 20:15:00	0.00	4.00	0	278	73	0.00	14.38	5.68	1	278	105	1.98
13-Oct-99 20:20:00	0.00	4.00	0	277	73	0.00	14.38	5.68	5	277	105	1.97
13-Oct-99 20:25:00	0.00	4.00	0	277	73	0.00	14.39	5.68	12	277	105	1.96
13-Oct-99 20:30:00	0.00	4.00	0	277	73	0.00	14.39	5.68	81	277	105	1.96
13-Oct-99 20:35:00	0.00	4.00	0	277	74	0.00	14.40	5.68	80	277	105	1.96
13-Oct-99 20:40:00	0.00	4.00	0	277	73	0.00	14.40	5.68	1	277	105	1.98
13-Oct-99 20:45:00	0.00	4.00	0	277	73	0.00	14.41	5.68	1	277	105	1.98
13-Oct-99 20:50:00	0.00	4.00	0	277	73	0.00	14.42	5.68	0	277	105	1.96
13-Oct-99 20:55:00	0.00	4.00	0	277	73	0.00	14.42	5.68	2	277	105	1.96
13-Oct-99 21:00:00	0.00	4.00	0	277	73	0.00	14.43	5.68	1	277	105	1.97

TABLE 6-1d. Ontario Hydro Method QA /QC

Test Project: IPSC

Personnel: M. Fehnler

Location: Stack

Test Run #: FB-50. OHM

Dates: 10/12/99

Sample Train ID: Purple

QA/QC Activity	Frequency	Control Limit	Corrective Action	Notes	Passed? (yes/no)	Date	Person
Data Analysis							
Validate spreadsheets with validated data set	before run data is entered	NA	find and correct errors		n/a	10/12	[illegible]
Check Data Entry	after data entry	check 20 % of data entered	find and correct errors				
Sample Analysis							
Field Reagent Blank	One per batch	any Hg detected	subtract from sample results (1)		2	12/17	TM
Field Blank	One per sample location	none			N/A	12/9	DA
Lab Spike	most frequent of every 10th sample or each batch	none	none		n/a	12/9	DA
Replicate Analysis	all samples duplicate; every tenth is triplicate	+/- 10%	recalibrate and reanlyze samples		PASS	12/9	DA
Reference Ash Sample Analysis	one per test program	none	none	certifed NIST traceable reference sample			

(1) Maximum correction is 10% of measured sample result or 10 times the instrument detection limit, whichever is less. If the blanks are greater than this guideline flag the re the results may be invalid.

2. data corrected for Hg in hydroxylamine. No Hg detected in other reagents.

Appendix F

List of Participants

List of Participants

Name	Company & Title	Phone Number
William Grimley	U.S. EPA	(919) 541-1065
Lara Autry	U.S. EPA	(919) 541-5544
Dennis Killian	IPSC Project Manager	(435) 864-4414 ext 6401
Rand Crafts	IPSC Program Leader	(435) 864-4414 ext 6494
Tom McGrath	EER Project Manager	(949) 552-1803
Glenn England	EER Program Manager	(949) 859-8851
Robert Sanford	EER Project QA Manager	(949) 552-1803
Bob Zimperman	EER Field Team Leader	(949) 552-1803
Dr. Keith Curtis	Ontario Hydro Technologies Project QA/QC Advisor	(416) 207-6150
Jerry Cunningham	Hazen Research	(303) 279-4501
Ron McLeod	Philip Analytical	(905) 332-8788
Dave Ladd	EER Sample Recovery	(949) 552-1803
John Jackson	EER Stack Sampling	(949) 552-1803
Mike Fukuda	EER Data Reduction	(949) 552-1803
Jeff Dean	EER Stack Sampling	(949) 552-1803

IPSC - Intermountain Power Services Corporation
EER - Energy and Environmental Research Corporation
U.S. EPA - United States Environmental Protection Agency
QA - Quality Assurance
QA/QC - Quality Assurance/Quality Control

Appendix G

Additional Information

Close

From: Rand Crafts [SMTP:Rand-C@ipsc.com]
To: TMcGrath@eercorp.com
Cc:

Subject: RE: Intermountain Mercury Testing
Sent: 11/2/99 11:38 AM **Importance:** Normal

Tom, In answer to your questions:

1) LOI's for 10/12, 10/13, and 10/14 were 0.43, 0.44, 0.44 respectively. These are the samples representing the period of testing. Early morning samples cover previous night only

2) Maximum Net air-to-cloth is 2.3 acfm/sq. ft.. Max Net air-to-cloth represents full load operation with compartment cleaning and maintenance occurring simultaneously.

3) Filter cleaning occurs continuously without impacting removal. Each unit has three casings with 16 compartments per casing. Max Net air-to-cloth allows one compartment to be out for cleaning and one for maintenance and still allow full load operation. There is always a compartment out of service for cleaning. A cleaning cycle completely isolates the compartment from the flue gas path, and lasts about 8 minutes, whereupon the next compartment is brought out of service. Cycle will repeat after all 16 compartments are cleaned. All three casings operate simultaneously. Therefore, cleaning is continuous.

4)Scrubber module density is in weight percent solids.

Hope this helps.

Rand Crafts
Intermountain Power
rand-c@ipsc.com
435-864-6494

You Wrote:
>>> "McGrath, Tom" <TMcGrath@eercorp.com> Tuesday, November 02, 1999 10:03:22 AM >>>
Rand, Apparently we did not collect the twice daily LOI data when we were
on-site. If you could forward this information it would be appreciated.
Other information we will need for the report includes:
- the air-to-cloth ratio and cleaning cylces for the fabric filters; and
- the units for the density of the scrubber liquor.
I think that's about it. The ash samples have been submitted to the lab for
Hg analysis. If you have any questions or comments, please give me a call.

Tom

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 2

	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
A Module	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
B Module	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**16.26**	**5.70**	**15**	**275**	**108**	**2.00**
C Module	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006
Average	**20.00**	**5.66**	**21.11**	**275**	**119**	**NC**
D Module	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**15.97**	**5.67**	**13**	**275**	**109**	**NC**
E Module	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
F Module	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**14.53**	**5.67**	**13**	**275**	**107**	**1.96**
Average/Total	**16.69**	**5.68**	**62.20**	**275**	**111**	**1.98**

NA - not applicable, module not operational
NC - not included in calculation of average. Assumed pressure sensor was inoperational during testing.

INTERMOUTAIN GENERATING STATION UNIT 2
CEMS DATA FOR RUN 3

	Unit Two Stack		
Timestamp	SO2 ppm (wet)	NOx ppm (wet)	CO2 % (wet)
Average	**19.7**	**256**	**13.04**
10/13/99 17:30	20.0	252	13.08
10/13/99 17:45	19.8	254	13.08
10/13/99 18:00	19.5	256	13.11
10/13/99 18:15	20.3	255	13.07
10/13/99 18:30	20.3	255	13.02
10/13/99 18:45	20.3	256	13.03
10/13/99 19:00	20.1	255	13.04
10/13/99 19:15	19.7	254	13.02
10/13/99 19:30	19.7	256	13.00
10/13/99 19:45	19.5	258	13.00
10/13/99 20:00	19.6	258	13.02
10/13/99 20:15	19.2	259	13.01
10/13/99 20:30	19.2	258	13.03
10/13/99 20:45	19.6	258	13.06
10/13/99 21:00	19.4	256	13.05

INTERMOUTAIN GENERATING STATION UNIT 2
OPACITY DATA FOR RUN 3

Timestamp		Unit Two Stack Opacity %
Average		**3.0**
10/13/99	17:30	3.0
10/13/99	17:36	3.0
10/13/99	17:42	3.0
10/13/99	17:48	3.0
10/13/99	17:54	3.0
10/13/99	18:00	3.0
10/13/99	18:06	3.0
10/13/99	18:12	3.0
10/13/99	18:18	3.0
10/13/99	18:24	3.0
10/13/99	18:30	3.0
10/13/99	18:36	3.0
10/13/99	18:42	3.0
10/13/99	18:48	3.0
10/13/99	18:54	3.0
10/13/99	19:00	3.0
10/13/99	19:06	3.0
10/13/99	19:12	3.0
10/13/99	19:18	3.0
10/13/99	19:24	3.0
10/13/99	19:30	3.0
10/13/99	19:36	3.0
10/13/99	19:42	3.0
10/13/99	19:48	3.0
10/13/99	19:54	3.0
10/13/99	20:00	3.0
10/13/99	20:06	3.0
10/13/99	20:12	3.0
10/13/99	20:18	3.0
10/13/99	20:24	3.0
10/13/99	20:30	3.0
10/13/99	20:36	3.0
10/13/99	20:42	3.0
10/13/99	20:48	3.0
10/13/99	20:54	3.0
10/13/99	21:00	3.0

INTERMOUTAIN GENERATING STATION UNIT 2 BOILER OPERATING DATA FOR RUN 4

	Coal Feed Rate Tons Totalized	Generator Output MW Gross	Steam Gen. Rate lbs/hr. X1000	No. of Burners Firing (Pulverizers inservice)								Excess O2 %
				A	B	C	D	E	F	G	H	
Timestamp	2COAXI185A	2TGBPK0022	2FWAFT0025	2SGAES0005	2SGAES0006	2SGAES0007	2SGAES0008	2SGAES0009	2SGAES0010	2SGAES0011	2SGAES0012	2INAKV0061
Average	**338**	**874**	**6188**	**ON**	**ON**	**ON**	**OFF**	**ON**	**ON**	**ON**	**ON**	**2.75**
14-Oct-99 10:05:00	186048	874	6,168	ON	ON	ON	OFF	ON	ON	ON	ON	2.71
14-Oct-99 10:10:00	186076	873	6,168	ON	ON	ON	OFF	ON	ON	ON	ON	2.77
14-Oct-99 10:15:00	186104	875	6,181	ON	ON	ON	OFF	ON	ON	ON	ON	2.57
14-Oct-99 10:20:00	186133	875	6,162	ON	ON	ON	OFF	ON	ON	ON	ON	2.53
14-Oct-99 10:25:00	186161	875	6,221	ON	ON	ON	OFF	ON	ON	ON	ON	2.57
14-Oct-99 10:30:00	186189	875	6,219	ON	ON	ON	OFF	ON	ON	ON	ON	2.62
14-Oct-99 10:35:00	186218	874	6,186	ON	ON	ON	OFF	ON	ON	ON	ON	2.63
14-Oct-99 10:40:00	186246	874	6,201	ON	ON	ON	OFF	ON	ON	ON	ON	2.64
14-Oct-99 10:45:00	186274	873	6,233	ON	ON	ON	OFF	ON	ON	ON	ON	2.66
14-Oct-99 10:50:00	186302	875	6,183	ON	ON	ON	OFF	ON	ON	ON	ON	2.56
14-Oct-99 10:55:00	186330	873	6,239	ON	ON	ON	OFF	ON	ON	ON	ON	2.62
14-Oct-99 11:00:00	186358	873	6,216	ON	ON	ON	OFF	ON	ON	ON	ON	2.84
14-Oct-99 11:05:00	186388	876	6,074	ON	ON	ON	OFF	ON	ON	ON	ON	3.02
14-Oct-99 11:10:00	186416	872	6,133	ON	ON	ON	OFF	ON	ON	ON	ON	3.00
14-Oct-99 11:15:00	186445	874	6,132	ON	ON	ON	OFF	ON	ON	ON	ON	2.84
14-Oct-99 11:20:00	186473	875	6,134	ON	ON	ON	OFF	ON	ON	ON	ON	3.09
14-Oct-99 11:25:00	186501	874	6,154	ON	ON	ON	OFF	ON	ON	ON	ON	2.84
14-Oct-99 11:30:00	186530	873	6,175	ON	ON	ON	OFF	ON	ON	ON	ON	2.85
14-Oct-99 11:35:00	186557	873	6,219	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
14-Oct-99 11:40:00	186585	873	6,289	ON	ON	ON	OFF	ON	ON	ON	ON	2.51
14-Oct-99 11:45:00	186613	870	6,296	ON	ON	ON	OFF	ON	ON	ON	ON	2.52
14-Oct-99 11:50:00	186642	878	6,263	ON	ON	ON	OFF	ON	ON	ON	ON	2.69
14-Oct-99 11:55:00	186670	873	6,174	ON	ON	ON	OFF	ON	ON	ON	ON	2.85
14-Oct-99 12:00:00	186698	874	6,218	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
14-Oct-99 12:05:00	186726	875	6,231	ON	ON	ON	OFF	ON	ON	ON	ON	2.65
14-Oct-99 12:10:00	186754	874	6,247	ON	ON	ON	OFF	ON	ON	ON	ON	2.71
14-Oct-99 12:15:00	186782	875	6,264	ON	ON	ON	OFF	ON	ON	ON	ON	2.76
14-Oct-99 12:20:00	186810	872	6,181	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
14-Oct-99 12:25:00	186839	876	6,032	ON	ON	ON	OFF	ON	ON	ON	ON	2.98
14-Oct-99 12:30:00	186867	874	6,154	ON	ON	ON	OFF	ON	ON	ON	ON	I/O Timeout
14-Oct-99 12:35:00	186895	874	6,184	ON	ON	ON	OFF	ON	ON	ON	ON	2.93
14-Oct-99 12:40:00	186924	875	6,175	ON	ON	ON	OFF	ON	ON	ON	ON	2.91
14-Oct-99 12:45:00	186952	876	6,176	ON	ON	ON	OFF	ON	ON	ON	ON	2.88
14-Oct-99 12:50:00	186980	872	6,180	ON	ON	ON	OFF	ON	ON	ON	ON	2.86
14-Oct-99 12:55:00	187008	874	6,192	ON	ON	ON	OFF	ON	ON	ON	ON	2.83
14-Oct-99 13:00:00	187037	874	6,202	ON	ON	ON	OFF	ON	ON	ON	ON	2.80
14-Oct-99 13:05:00	187065	875	6,168	ON	ON	ON	OFF	ON	ON	ON	ON	2.78
14-Oct-99 13:10:00	187093	873	6,140	ON	ON	ON	OFF	ON	ON	ON	ON	2.75
14-Oct-99 13:15:00	187121	874	6,186	ON	ON	ON	OFF	ON	ON	ON	ON	2.72
14-Oct-99 13:20:00	187149	875	6,186	ON	ON	ON	OFF	ON	ON	ON	ON	2.70
14-Oct-99 13:25:00	187177	876	6,176	ON	ON	ON	OFF	ON	ON	ON	ON	2.67
14-Oct-99 13:30:00	187205	874	6,177	ON	ON	ON	OFF	ON	ON	ON	ON	2.64

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER
OPERATING DATA SUMMARY FOR RUN 4

	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Casing A	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033
Average	**8.04**	**288**	**290**	**0.5270**
Casing B	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037
Average	**8.36**	**322**	**311**	**0.7762**
Casing C	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**8.14**	**295**	**286**	**0.6110**
Average/Total	**8.18**	**302**	**296**	**1.914**

INTERMOUTAIN GENERATING STATION UNIT 2 FABRIC FILTER OPERATING DATA FOR RUN 4

	A Casing Fabric Filter				B Casing Fabric Filter				C Casing Fabric Filter			
	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp deg. F	Gas Flow Rate cfm x10e5	Pres. Drop in. w.c.	Inlet Temp. deg. F	Outlet Temp. deg. F	Gas Flow Rate cfm x10e5
Timestamp	2CCBA40001	2CCBA30037	2CCBA30036	2CCBA30033	2CCBB40001	2CCBB30041	2CCBB30040	2CCBB30037	2CCBC40001	2CCBC30037	2CCBC30036	2CCBC30033
Average	**8.04**	**288**	**290**	**0.53**	**8.36**	**322**	**311**	**0.7762**	**8.14**	**295**	**286**	**0.6110**
14-Oct-99 10:05:00	7.52	274	277	0.5141	7.80	303	294	0.7192	7.50	280	273	0.6524
14-Oct-99 10:10:00	7.65	275	279	0.5828	7.87	304	294	0.7192	7.72	281	271	0.5270
14-Oct-99 10:15:00	7.83	275	279	0.5395	7.93	305	295	0.8023	7.76	281	275	0.6004
14-Oct-99 10:20:00	7.71	275	280	0.5445	7.93	305	295	0.7360	7.79	282	272	0.6516
14-Oct-99 10:25:00	7.61	276	280	0.5250	7.85	306	297	0.6328	7.78	282	276	0.5248
14-Oct-99 10:30:00	7.83	277	281	0.5285	8.09	307	298	0.7504	7.76	283	277	0.5840
14-Oct-99 10:35:00	7.61	278	281	0.5418	7.94	309	299	0.7473	7.75	284	276	0.5731
14-Oct-99 10:40:00	7.58	278	281	0.5703	8.00	309	298	0.7446	7.70	285	278	0.6285
14-Oct-99 10:45:00	7.70	278	282	0.6977	8.07	310	299	0.7696	7.82	285	276	0.5848
14-Oct-99 10:50:00	7.78	280	283	0.5153	7.97	311	301	0.8121	7.94	286	279	0.5434
14-Oct-99 10:55:00	7.90	280	284	0.2499	8.20	312	301	0.7434	8.05	287	279	0.6422
14-Oct-99 11:00:00	7.99	281	284	0.6008	8.31	314	303	0.7512	8.18	289	277	0.6590
14-Oct-99 11:05:00	7.88	283	285	0.5285	8.30	316	303	0.8582	8.23	291	282	0.4692
14-Oct-99 11:10:00	8.16	284	286	0.5684	8.50	318	305	0.7653	8.10	292	282	0.6703
14-Oct-99 11:15:00	8.43	285	287	0.5432	8.60	320	306	0.9191	8.43	294	285	0.6158
14-Oct-99 11:20:00	8.32	286	288	0.5844	8.61	323	309	0.7543	8.70	294	285	0.6426
14-Oct-99 11:25:00	8.25	286	288	0.5207	8.53	324	310	0.7946	8.03	294	286	0.6895
14-Oct-99 11:30:00	8.15	287	289	0.6078	8.53	324	310	0.6918	8.15	294	287	0.5160
14-Oct-99 11:35:00	8.05	288	290	0.4074	8.20	325	313	0.8160	8.03	294	288	0.6256
14-Oct-99 11:40:00	8.02	288	290	0.4805	8.26	325	313	0.8074	7.91	293	288	0.6656
14-Oct-99 11:45:00	8.21	288	290	0.5692	8.45	326	314	0.7821	8.26	297	285	0.5750
14-Oct-99 11:50:00	8.20	291	291	0.5602	8.59	328	314	0.8082	8.29	300	288	0.6206
14-Oct-99 11:55:00	8.01	292	293	0.2371	8.28	326	314	0.7813	8.08	299	290	0.6067
14-Oct-99 12:00:00	7.97	292	293	0.5559	8.18	325	314	0.7184	7.93	298	289	0.6164
14-Oct-99 12:05:00	7.89	292	294	0.5543	8.19	325	316	0.7274	7.86	296	288	0.6473
14-Oct-99 12:10:00	7.84	291	294	0.5235	8.24	326	315	0.8019	7.80	296	288	0.4590
14-Oct-99 12:15:00	8.11	292	294	0.5742	8.48	327	316	0.7739	8.21	297	292	0.6313
14-Oct-99 12:20:00	8.62	292	295	0.4735	8.79	328	318	0.8511	8.45	297	292	0.6070
14-Oct-99 12:25:00	8.41	294	295	0.5264	8.76	329	319	0.6918	8.62	300	290	0.7153
14-Oct-99 12:30:00	8.35	295	296	0.6285	8.77	329	317	0.9269	8.69	301	293	0.6113
14-Oct-99 12:35:00	8.26	295	297	0.5590	8.70	331	319	0.6899	8.43	303	293	0.5684
14-Oct-99 12:40:00	8.22	295	297	0.4488	8.60	333	321	0.9039	8.40	303	296	0.6625
14-Oct-99 12:45:00	8.19	296	297	0.5160	8.77	333	321	0.7500	8.45	302	294	0.6586
14-Oct-99 12:50:00	8.20	296	297	0.6106	8.63	334	323	0.8386	8.62	302	296	0.5856
14-Oct-99 12:55:00	8.34	297	296	0.5602	8.52	334	322	0.8234	8.22	302	294	0.6063
14-Oct-99 13:00:00	8.17	297	296	0.2625	8.50	334	324	0.7227	8.33	302	294	0.6764
14-Oct-99 13:05:00	8.11	298	297	0.5992	8.49	334	323	0.8234	8.26	302	294	0.6485
14-Oct-99 13:10:00	8.13	298	297	0.5378	8.34	334	323	0.8215	8.22	303	294	0.6528
14-Oct-99 13:15:00	8.00	297	299	0.5567	8.35	333	323	0.8012	8.20	304	298	0.4410
14-Oct-99 13:20:00	8.13	298	299	0.6160	8.70	333	324	0.6961	8.07	305	296	0.6707
14-Oct-99 13:25:00	8.28	298	299	0.4367	8.68	333	325	0.8375	8.57	304	296	0.6707
14-Oct-99 13:30:00	8.30	298	300	0.5774	8.71	333	326	0.6930	8.44	304	297	0.6649

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA SUMMARY FOR RUN 4

	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
A Module	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
B Module	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**16.96**	**5.69**	**14**	**276**	**107**	**2.00**
C Module	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006
Average	**20.00**	**5.66**	**18**	**276**	**116**	**NC**
D Module	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**16.25**	**5.69**	**11**	**276**	**105**	**NC**
E Module	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006
Average	**NA**	**NA**	**0/NA**	**NA**	**NA**	**NA**
F Module	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**14.46**	**5.69**	**12**	**276**	**102**	**1.98**
Average/Total	**16.92**	**5.68**	**54**	**276**	**107**	**1.99**

NA - not applicable, module not operational
NC - not included in calculation of average. Assumed pressure sensor was inoperational during testing.

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 4

	A Module						B Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCA30016	2CCCA30008	2CCCA30015	2CCCM30012	2CCCA30009	2CCCA30006	2CCCB30016	2CCCB30008	2CCCB30015	2CCCM30012	2CCCB30009	2CCCB30006
Average	**0.01**	**7.82**	**0.000544**	**276**	**41**	**0.07**	**16.96**	**5.69**	**14**	**276**	**107**	**2.00**
14-Oct-99 10:05:00	0.01	7.82	0.000000	269	32	0.06	17.27	5.69	0	269	106	2.00
14-Oct-99 10:10:00	0.01	7.82	0.000000	270	32	0.06	17.34	5.69	0	270	106	2.00
14-Oct-99 10:15:00	0.01	7.82	0.000000	270	33	0.06	17.42	5.69	4	270	106	2.00
14-Oct-99 10:20:00	0.01	7.82	0.000000	270	33	0.06	17.35	5.69	0	270	106	2.00
14-Oct-99 10:25:00	0.01	7.82	0.000000	270	34	0.06	17.26	5.69	1	270	101	2.00
14-Oct-99 10:30:00	0.01	7.82	0.000000	271	34	0.06	17.18	5.69	2	271	102	2.00
14-Oct-99 10:35:00	0.01	7.82	0.000000	271	34	0.06	17.07	5.69	1	271	105	2.00
14-Oct-99 10:40:00	0.01	7.82	0.000000	271	35	0.06	16.97	5.69	1	271	108	2.00
14-Oct-99 10:45:00	0.01	7.82	0.000000	272	35	0.06	16.86	5.69	14	272	106	2.00
14-Oct-99 10:50:00	0.01	7.82	0.000000	272	36	0.06	16.79	5.69	107	272	104	2.00
14-Oct-99 10:55:00	0.01	7.82	0.000000	272	36	0.06	16.89	5.69	0	272	101	2.00
14-Oct-99 11:00:00	0.01	7.82	0.000000	273	37	0.07	16.97	5.69	0	273	101	2.00
14-Oct-99 11:05:00	0.01	7.82	0.000000	273	37	0.07	17.00	5.69	0	273	104	2.00
14-Oct-99 11:10:00	0.01	7.82	0.000000	273	37	0.07	16.94	5.69	1	273	107	2.00
14-Oct-99 11:15:00	0.01	7.82	0.000000	273	38	0.07	16.87	5.69	2	273	108	2.00
14-Oct-99 11:20:00	0.01	7.82	0.000000	274	38	0.07	16.91	5.69	0	274	108	2.00
14-Oct-99 11:25:00	0.01	7.82	0.000000	274	39	0.07	16.77	5.69	2	274	108	2.00
14-Oct-99 11:30:00	0.01	7.82	0.000000	274	39	0.07	16.64	5.69	2	274	109	2.00
14-Oct-99 11:35:00	0.01	7.82	0.000000	275	40	0.07	17.01	5.69	26	275	109	2.00
14-Oct-99 11:40:00	0.01	7.82	0.000000	275	40	0.07	17.11	5.69	105	275	109	2.00
14-Oct-99 11:45:00	0.01	7.82	0.000000	275	40	0.07	17.10	5.69	1	275	109	2.00
14-Oct-99 11:50:00	0.01	7.82	0.000000	276	41	0.07	17.10	5.69	1	276	110	2.00
14-Oct-99 11:55:00	0.01	7.82	0.000000	276	41	0.07	17.10	5.69	1	276	110	2.00
14-Oct-99 12:00:00	0.01	7.82	0.000000	276	42	0.07	17.10	5.69	1	276	110	2.00
14-Oct-99 12:05:00	0.01	7.82	0.000000	276	42	0.07	17.09	5.69	0	276	110	2.00
14-Oct-99 12:10:00	0.01	7.82	0.000000	277	43	0.07	17.09	5.69	1	277	110	2.00
14-Oct-99 12:15:00	0.01	7.82	0.000000	277	43	0.07	17.11	5.69	4	277	109	2.00
14-Oct-99 12:20:00	0.01	7.82	0.000000	277	44	0.07	17.14	5.69	3	277	109	2.00
14-Oct-99 12:25:00	0.01	7.82	0.000000	278	44	0.07	17.16	5.69	29	278	108	2.00
14-Oct-99 12:30:00	0.01	7.82	0.000000	279	44	0.07	17.19	5.69	101	279	108	2.00
14-Oct-99 12:35:00	0.01	7.82	0.000000	279	45	0.07	17.15	5.69	0	279	108	2.00
14-Oct-99 12:40:00	0.01	7.82	0.000000	280	45	0.07	17.06	5.69	1	280	107	2.00
14-Oct-99 12:45:00	0.01	7.82	0.000000	281	46	0.07	16.96	5.69	0	281	107	2.00
14-Oct-99 12:50:00	0.01	7.82	0.000000	282	46	0.07	16.86	5.69	0	282	106	2.00
14-Oct-99 12:55:00	0.01	7.82	0.000000	282	47	0.07	16.57	5.69	0	282	106	2.00
14-Oct-99 13:00:00	0.00	7.82	0.000000	283	47	0.07	16.30	5.69	1	283	105	2.00
14-Oct-99 13:05:00	0.00	7.82	0.000000	286	47	0.07	16.30	5.69	1	286	106	2.00
14-Oct-99 13:10:00	0.00	7.82	0.000000	286	48	0.07	16.30	5.69	3	286	107	2.00
14-Oct-99 13:15:00	0.00	7.82	0.002113	286	48	0.07	16.49	5.69	6	286	108	2.00
14-Oct-99 13:20:00	0.00	7.82	0.004515	286	49	0.07	16.49	5.69	119	286	108	2.00
14-Oct-99 13:25:00	0.00	7.82	0.006916	286	49	0.07	16.81	5.69	39	286	109	2.00
14-Oct-99 13:30:00	0.00	7.82	0.009317	286	50	0.07	17.13	5.69	1	286	109	2.00

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 4

	C Module						D Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCC30017	2CCCC30008	2CCCC30016	2CCCM30012	2CCCC30010	2CCCC30006	2CCCD30016	2CCCD30008	2CCCD30015	2CCCM30012	2CCCD30009	2CCCD30006
Average	**20.00**	**5.66**	**18.08**	**276**	**116**	**0.00**	**16.25**	**5.69**	**11**	**276**	**105**	**0.01**
14-Oct-99 10:05:00	20.00	5.67	1.21	269	116	0.00	16.61	5.69	0	269	106	0.00
14-Oct-99 10:10:00	20.00	5.67	2.08	270	116	0.00	16.59	5.69	0	270	106	0.00
14-Oct-99 10:15:00	20.00	5.67	4.28	270	116	0.00	16.56	5.69	0	270	106	0.00
14-Oct-99 10:20:00	20.00	5.67	119.44	270	116	0.00	16.54	5.69	0	270	106	0.00
14-Oct-99 10:25:00	20.00	5.67	1.44	270	116	0.00	16.48	5.69	0	270	106	0.00
14-Oct-99 10:30:00	20.00	5.67	0.65	271	116	0.00	16.42	5.69	2	271	106	0.00
14-Oct-99 10:35:00	20.00	5.67	1.52	271	116	0.00	16.36	5.69	1	271	106	0.00
14-Oct-99 10:40:00	20.00	5.67	119.86	271	116	0.00	16.33	5.69	15	271	105	0.00
14-Oct-99 10:45:00	20.00	5.67	1.50	272	116	0.00	16.29	5.69	120	272	103	0.00
14-Oct-99 10:50:00	20.00	5.67	0.84	272	116	0.00	16.26	5.69	0	272	101	0.00
14-Oct-99 10:55:00	20.00	5.67	1.19	272	116	0.00	16.24	5.69	0	272	99	0.00
14-Oct-99 11:00:00	20.00	5.67	2.16	273	116	0.00	16.22	5.69	0	273	97	0.00
14-Oct-99 11:05:00	20.00	5.67	0.48	273	116	0.00	16.20	5.69	0	273	93	0.00
14-Oct-99 11:10:00	20.00	5.67	3.64	273	116	0.00	16.18	5.69	0	273	106	0.00
14-Oct-99 11:15:00	20.00	5.67	115.08	273	116	0.00	16.16	5.69	0	273	106	0.01
14-Oct-99 11:20:00	20.00	5.67	80.80	274	116	0.00	16.14	5.69	1	274	106	0.01
14-Oct-99 11:25:00	20.00	5.67	1.08	274	116	0.00	16.11	5.69	1	274	106	0.01
14-Oct-99 11:30:00	20.00	5.66	3.69	274	116	0.00	16.10	5.69	1	274	105	0.01
14-Oct-99 11:35:00	20.00	5.66	2.41	275	116	0.00	16.22	5.69	1	275	105	0.01
14-Oct-99 11:40:00	20.00	5.66	1.13	275	116	0.00	16.33	5.69	37	275	105	0.01
14-Oct-99 11:45:00	20.00	5.66	0.21	275	116	0.00	16.33	5.69	91	275	105	0.01
14-Oct-99 11:50:00	20.00	5.66	0.76	276	116	0.00	16.33	5.69	0	276	105	0.01
14-Oct-99 11:55:00	20.00	5.66	2.09	276	116	0.00	16.33	5.69	0	276	105	0.01
14-Oct-99 12:00:00	20.00	5.66	0.96	276	116	0.00	16.33	5.69	1	276	105	0.01
14-Oct-99 12:05:00	20.00	5.66	2.27	276	116	0.00	16.33	5.69	0	276	105	0.01
14-Oct-99 12:10:00	20.00	5.66	14.24	277	116	0.00	16.33	5.69	0	277	105	0.01
14-Oct-99 12:15:00	20.00	5.66	119.21	277	116	0.00	16.32	5.69	0	277	105	0.01
14-Oct-99 12:20:00	20.00	5.66	0.30	277	116	0.00	16.32	5.69	0	277	105	0.01
14-Oct-99 12:25:00	20.00	5.66	0.68	278	116	0.00	16.32	5.69	0	278	105	0.01
14-Oct-99 12:30:00	20.00	5.66	0.63	279	116	0.00	16.32	5.69	0	279	104	0.01
14-Oct-99 12:35:00	20.00	5.66	3.63	279	116	0.00	16.32	5.69	0	279	104	0.01
14-Oct-99 12:40:00	20.00	5.66	1.97	280	116	0.00	16.24	5.69	0	280	104	0.01
14-Oct-99 12:45:00	20.00	5.66	0.31	281	116	0.00	16.06	5.69	1	281	104	0.01
14-Oct-99 12:50:00	20.00	5.66	0.25	282	116	0.00	15.99	5.69	1	282	104	0.01
14-Oct-99 12:55:00	20.00	5.66	0.82	282	116	0.00	15.99	5.69	2	282	104	0.01
14-Oct-99 13:00:00	20.00	5.66	2.74	283	116	0.00	16.01	5.69	5	283	104	0.01
14-Oct-99 13:05:00	20.00	5.66	1.46	286	116	0.00	15.99	5.69	118	286	104	0.01
14-Oct-99 13:10:00	20.00	5.66	1.02	286	116	0.00	15.97	5.69	0	286	101	0.01
14-Oct-99 13:15:00	20.00	5.66	27.83	286	116	0.00	16.24	5.69	1	286	109	0.01
14-Oct-99 13:20:00	20.00	5.66	111.77	286	116	0.00	16.05	5.69	0	286	109	0.01
14-Oct-99 13:25:00	20.00	5.67	1.34	286	116	0.00	16.06	5.69	1	286	109	0.01
14-Oct-99 13:30:00	20.00	5.67	0.39	286	116	0.00	16.11	5.69	42	286	109	0.01

INTERMOUTAIN GENERATING STATION UNIT 2 WET SCRUBBER OPERATING DATA FOR RUN 4

	E Module						F Module					
	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.	Slurry Density	Slurry ph. Rxn. Tank	Slurry Flow Rate gpm	Inlet Temp. deg. F	Outlet Temp. deg. F	Press. Drop in. w.c.
Timestamp	2CCCE30017	2CCCE30008	2CCCE30016	2CCCM30012	2CCCE30010	2CCCE30006	2CCCF30016	2CCCF30008	2CCCF30015	2CCCM30012	2CCCF30009	2CCCF30006
Average	**0.00**	**4.00**	**0**	**276**	**61**	**0.01**	**14.46**	**5.69**	**12**	**276**	**102**	**1.98**
14-Oct-99 10:05:00	0.00	4.00	0	269	60	0.01	14.50	5.67	0	269	102	1.96
14-Oct-99 10:10:00	0.00	4.00	0	270	60	0.01	14.48	5.67	0	270	102	1.97
14-Oct-99 10:15:00	0.00	4.00	0	270	60	0.01	14.47	5.67	3	270	102	1.97
14-Oct-99 10:20:00	0.00	4.00	0	270	60	0.01	14.46	5.67	1	270	101	1.95
14-Oct-99 10:25:00	0.00	4.00	0	270	60	0.01	14.45	5.68	1	270	101	1.97
14-Oct-99 10:30:00	0.00	4.00	0	271	60	0.01	14.44	5.68	3	271	101	1.98
14-Oct-99 10:35:00	0.00	4.00	0	271	60	0.01	14.43	5.68	9	271	100	1.98
14-Oct-99 10:40:00	0.00	4.00	0	271	60	0.01	14.42	5.68	120	271	100	1.96
14-Oct-99 10:45:00	0.00	4.00	0	272	60	0.01	14.41	5.68	0	272	100	1.97
14-Oct-99 10:50:00	0.00	4.00	0	272	60	0.01	14.40	5.68	2	272	100	1.97
14-Oct-99 10:55:00	0.00	4.00	0	272	60	0.01	14.39	5.68	3	272	99	1.97
14-Oct-99 11:00:00	0.00	4.00	0	273	60	0.01	14.38	5.68	0	273	99	1.97
14-Oct-99 11:05:00	0.00	4.00	0	273	60	0.01	14.37	5.68	1	273	94	1.97
14-Oct-99 11:10:00	0.00	4.00	0	273	60	0.01	14.36	5.69	1	273	104	1.97
14-Oct-99 11:15:00	0.00	4.00	0	273	60	0.01	14.34	5.69	3	273	104	1.97
14-Oct-99 11:20:00	0.00	4.00	0	274	60	0.01	14.33	5.69	7	274	104	1.97
14-Oct-99 11:25:00	0.00	4.00	0	274	60	0.01	14.32	5.69	120	274	104	1.97
14-Oct-99 11:30:00	0.00	4.00	0	274	60	0.01	14.31	5.69	1	274	104	1.97
14-Oct-99 11:35:00	0.00	4.00	0	275	60	0.01	14.30	5.69	3	275	103	1.98
14-Oct-99 11:40:00	0.00	4.00	0	275	60	0.01	14.29	5.69	4	275	103	1.97
14-Oct-99 11:45:00	0.00	4.00	0	275	60	0.01	14.31	5.69	1	275	103	1.97
14-Oct-99 11:50:00	0.00	4.00	0	276	60	0.01	14.33	5.69	1	276	103	1.97
14-Oct-99 11:55:00	0.00	4.00	0	276	60	0.01	14.35	5.70	1	276	103	1.97
14-Oct-99 12:00:00	0.00	4.00	0	276	60	0.01	14.37	5.70	1	276	102	1.97
14-Oct-99 12:05:00	0.00	4.00	0	276	60	0.01	14.39	5.70	7	276	102	1.97
14-Oct-99 12:10:00	0.00	4.00	0	277	60	0.01	14.41	5.70	53	277	102	1.98
14-Oct-99 12:15:00	0.00	4.00	0	277	60	0.01	14.43	5.70	0	277	102	1.98
14-Oct-99 12:20:00	0.00	4.00	0	277	61	0.01	14.45	5.70	0	277	102	1.98
14-Oct-99 12:25:00	0.00	4.00	0	278	61	0.01	14.47	5.70	0	278	101	1.98
14-Oct-99 12:30:00	0.00	4.00	0	279	61	0.01	14.49	5.70	1	279	101	1.99
14-Oct-99 12:35:00	0.00	4.00	0	279	61	0.01	14.51	5.71	1	279	101	1.99
14-Oct-99 12:40:00	0.00	4.00	0	280	61	0.01	14.52	5.71	1	280	101	1.99
14-Oct-99 12:45:00	0.00	4.00	0	281	62	0.01	14.54	5.71	25	281	101	1.99
14-Oct-99 12:50:00	0.00	4.00	0	282	62	0.01	14.56	5.71	115	282	101	2.00
14-Oct-99 12:55:00	0.00	4.00	0	282	62	0.01	14.58	5.71	0	282	100	2.00
14-Oct-99 13:00:00	0.00	4.00	0	283	62	0.01	14.60	5.71	0	283	100	2.00
14-Oct-99 13:05:00	0.00	4.00	0	286	63	0.01	14.62	5.71	0	286	100	2.00
14-Oct-99 13:10:00	0.00	4.00	0	286	63	0.01	14.64	5.71	0	286	96	2.00
14-Oct-99 13:15:00	0.00	4.00	0	286	63	0.01	14.66	5.71	0	286	108	2.00
14-Oct-99 13:20:00	0.00	4.00	0	286	63	0.01	14.68	5.72	0	286	108	1.99
14-Oct-99 13:25:00	0.00	4.00	0	286	63	0.01	14.70	5.72	1	286	108	1.99
14-Oct-99 13:30:00	0.00	4.00	0	286	64	0.01	14.72	5.72	10	286	108	1.99

INTERMOUTAIN GENERATING STATION UNIT 2
CEMS DATA FOR RUN 4

	Unit Two Stack		
Timestamp	SO2 ppm (wet)	NOx ppm (wet)	CO2 % (wet)
Average	**19.6**	**237**	**13.04**
10/14/99 10:00	18.6	223	13.08
10/14/99 10:15	18.6	224	13.10
10/14/99 10:30	20.2	220	13.11
10/14/99 10:45	19.7	232	13.10
10/14/99 11:00	18.6	243	12.86
10/14/99 11:15	18.7	243	12.96
10/14/99 11:30	19.7	236	13.11
10/14/99 11:45	19.8	244	13.00
10/14/99 12:00	19.6	239	13.09
10/14/99 12:15	20.1	244	12.98
10/14/99 12:30	20.1	248	13.00
10/14/99 12:45	20.3	240	13.04
10/14/99 13:00	19.0	240	13.06
10/14/99 13:15	20.7	237	13.05
10/14/99 13:30	20.5	235	13.01

INTERMOUTAIN GENERATING STATION UNIT 2
OPACITY DATA FOR RUN 4

Timestamp		Unit Two Stack Opacity %
Average		**3.3**
10/14/99	10:00	2.83
10/14/99	10:06	2.83
10/14/99	10:12	2.94
10/14/99	10:18	2.87
10/14/99	10:24	3.22
10/14/99	10:30	3.12
10/14/99	10:36	3.22
10/14/99	10:42	3.27
10/14/99	10:48	2.99
10/14/99	10:54	3.22
10/14/99	11:00	3.18
10/14/99	11:06	3.06
10/14/99	11:12	3.09
10/14/99	11:18	2.88
10/14/99	11:24	3.13
10/14/99	11:30	3.07
10/14/99	11:36	3.39
10/14/99	11:42	3.47
10/14/99	11:48	3.52
10/14/99	11:54	3.19
10/14/99	12:00	3.11
10/14/99	12:06	3.44
10/14/99	12:12	3.11
10/14/99	12:18	3.69
10/14/99	12:24	3.44
10/14/99	12:30	3.38
10/14/99	12:36	3.54
10/14/99	12:42	3.62
10/14/99	12:48	3.55
10/14/99	12:54	3.30
10/14/99	13:00	3.40
10/14/99	13:06	3.41
10/14/99	13:12	3.43
10/14/99	13:18	3.57
10/14/99	13:24	3.63
10/14/99	13:30	3.80

Scrubber Info

Slurry Recirc Flows

Run 2 10/13/1999 11:30 - 15:45

		Density	pH	Level	Amps	GPM
MODULE B		16.28	5.70	23.36		
	Pump 1B				24.59	14870
	Pump 2B				24.59	14868
	Pump 3B				20.75	12550
					Total Module	42289
MODULE C		20.00	5.66	23.82		
	Pump 1C				25.05	15145
	Pump 2C				24.58	14864
	Pump 3C				22.90	13845
					Total Module	43854
MODULE D		15.96	5.68	24.20		
	Pump 1D				20.47	12377
	Pump 2D				19.93	12049
	Pump 3D				19.38	11720
					Total Module	36145
MODULE F		14.51	5.67	23.47		
	Pump 1F				26.14	15808
	Pump 2F				22.13	13381
	Pump 3F				21.39	12932
					Total Module	42120
					Total Scrubber	164408

Scrubber Info

Slurry Recirc Flows

Run 3 10/13/1999 17:15 - 21:00

		Density	pH	Level	Amps	GPM
MODULE B		16.25	5.70	23.28		
	Pump 1B				24.53	14830
	Pump 2B				24.59	14868
	Pump 3B				20.66	12491
					Total Module	42189
MODULE C		20.00	5.69	23.79		
	Pump 1C				25.02	15131
	Pump 2C				24.42	14764
	Pump 3C				22.80	13784
					Total Module	43678
MODULE D		15.55	5.68	24.20		
	Pump 1D				20.32	12288
	Pump 2D				19.88	12023
	Pump 3D				18.95	11456
					Total Module	35768
MODULE F		14.23	5.68	23.17		
	Pump 1F				25.69	15535
	Pump 2F				22.22	13437
	Pump 3F				20.95	12670
					Total Module	41642
					Total Scrubber	163278

Scrubber Info

Slurry Recirc Flows

Run 4 10/14/1999 10:00 - 14:00

		Density	pH	Level	Amps	GPM
MODULE B		16.96	5.69	23.13		
	Pump 1B				24.74	14957
	Pump 2B				24.70	14935
	Pump 3B				20.97	12680
					Total Module	42572
MODULE C		20.00	5.66	23.40		
	Pump 1C				24.67	14917
	Pump 2C				24.26	14671
	Pump 3C				22.87	13827
					Total Module	43414
MODULE D		16.26	5.69	24.05		
	Pump 1D				20.32	12285
	Pump 2D				19.91	12039
	Pump 3D				19.43	11749
					Total Module	36073
MODULE F		14.46	5.68	22.88		
	Pump 1F				25.67	15522
	Pump 2F				22.19	13420
	Pump 3F				20.94	12660
					Total Module	41602
					Total Scrubber	163661