Agrium

Agrium Conda Phosphate Operations*
3010 Conda Road
Soda Springs, ID 83276
Tel: 208-547-4381
Fax: 208-547-2550

May 13, 2005

File No.: EN-04-064

FedEx Tracking # 792922272195

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of our annual compliance report for a source test conducted at our facility April 15, 2005 by Antec Environmental Services. Attached to the report is Supplements 1, which contains an emission summary and monitored data.

In accordance with IDAPA 58.01.01.123, and "based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

Sincerely,

for

Charles H. Ross
General Manager

CHR:mj
Enc. (2) copies of test report + (2) copies of Supplements 1

Agrium

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Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of reports for annual source testing conducted at our facility April 15, 2005 by Antec Environmental Services, a Northbend, Washington testing company. The stack test was conducted at worst-case normal conditions, as described at IDAPA 58.01.01.157.02.a. The report includes test data for the following source at our Conda facility, listed with applicable Tier I Operating Permit 029-00003 sections limiting emissions:

Phosphate Fertilizer Production Process ("Granulation Plant") - Section 2.10

In addition to the reports produced by Antec, I have included operational monitored data and calculations demonstrating compliance/non-compliance for each test. This information is included with this letter as Supplement 1 to Antec's report. A summary of data and emission calculations appear below:

Phosphate Fertilizer Production Process ("Granulation Plant") - Section 2.10

Test date: April 15, 2005

Permitted fluoride emissions:	0.058 lb/Ton P_2O_5 feed
Fluoride emissions during test:	0.049 lb/Ton P_2O_5 feed [In compliance]
P_2O_5 feed to process during test:	44.36 tons/hr
Pressure drop across granulator scrubber:	18.6 inches H_2O
Pressure drop across dryer scrubber:	16.6 inches H_2O
Granulator scrubber flow rate:	375 gpm
Dryer scrubber flow rate:	725 gpm

As indicated by the sampling data provided by Antec and the summary above, the source test and calculations demonstrated compliance to permit limitations.

Opacity readings were performed during the test and observations are included.

It is our pleasure and opportunity to provide you with this source test information. We appreciate DEQ's assistance in helping us maintain compliance with state and federal air quality regulations.

If you have any questions concerning this letter or the enclosed Compliance Report by Antec, please call me at (208) 547-4381 extension 263.

Sincerely,

Monty Johnson
Environmental Manager

Attachments: Supplement 1 to Antec Report
Enclosures: two (2) copies of Antec report for April 15, 2005

Nu-west Industries, Inc.
d.b.a. Agrium Conda Phosphate Operations
3010 Conda Road
Soda Springs, Idaho 83276

Fluoride Emission Calculation (40 CFR 63.606(c)(1):

$$E = \left(\sum_{i=1}^{N} C_{si} Q_{sdi} \right) / (PK)$$

Where:
E = emission rate of total fluorides, (lb/ton) of equivalent P_2O_5 feed
C_{si} = concentration of total fluorides from emission point "i", (mg/dscf)
Q_{sdi} = volumetric flow rate of effluent gas from emission point "i", (dscf/hr)
N = number of emission points associated with the affected facility.
P = equivalent P_2O_5 feed rate, (ton/hr)
K = conversion factor, (453,600 mg/lb)

Run #1 **Granulation 04/15/05**

Csi =	11.6 mg F/	33.991 DSCF		
Q_{sdi} =	44776 DSCFM	2686560 DSCFH		
N =	1			
P =	242 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.30 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.045623 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**78.7**

Run #2 **Granulation 04/15/05**

Csi =	6.43 mg F/	35.661 DSCF		
Q_{sdi} =	48239 DSCFM	2894340 DSCFH		
N =	1			
P =	243 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.49 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.025863 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**44.6**

Run #3 **Granulation 04/15/05**

Csi =	19.4 mg F/	35.268 DSCF		
Q_{sdi} =	46305 DSCFM	2778300 DSCFH		
N =	1			
P =	242 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.30 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.076049 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**131.1**
		% of Std. Ave. =		**84.8**

Prepared by: Monty Johnson

Granulator EPA 1-4

Client: Agrium
Location: Soda Springs, ID
Source: Granulator
Date: April 15, 2005
Project No.: AES5041

		Run #1	Run #2	Run #3	
		4/15/2005	4/15/2005	4/15/2005	
		754	1018	1220	
		913	1131	1334	**Averages**
Q:	Total sample time[1]:	72	72	72	**72**
Vm:	(Volume,dry gas meter,cf)	39.510	41.975	41.599	**41.028**
Y:	(Dry gas meter calibration factor)	0.995	0.995	0.995	**0.995**
Pbar:	(Barometric pressure,in.Hg)	24.50	24.50	24.50	**24.50**
ΔH:	(Avg. differential pressure,in.H2O)	1.04	1.14	1.11	**1.10**
Tm:	(Avg. meter temperature,°F)	41.4	48.6	48.9	**46.3**
Vm(std.):	(Std.* sample gas volume, DSCF)	33.991	35.611	35.268	**34.957**
Vlc:	(Liquid volume collected,ml)	279.8	232.3	323.3	**278.5**
Vw(std):	(Std.* water vapor volume,scf)	13.170	10.934	15.218	**13.107**
SVP:	(Saturated H_2O vapor pressure, in. Hg	6.92	6.95	6.97	**6.945**
Bwsat:	(Saturated Moisture @ Ts)	0.282	0.283	0.284	**0.283**
Bwsvol	(Volumemetric Moisture content)	0.279	0.235	0.301	**0.272**
Bws:	(SCF H_2O / SCF Total)[2]	0.279	0.235	0.284	**0.266**
$\%CO_2$:	(Carbon Dioxide,% by volume,dry)	0.53	0.54	0.52	**0.53**
$\%O_2$:	(Oxygen,% by volume,dry)	20.12	20.09	19.99	**20.07**
$\%N_2$:	(Nitrogen,% by volume,dry)	79.35	79.37	79.49	**79.40**
Md:	(Molecular Weight,lb/lb-mole,dry)	28.89	28.89	28.88	**28.89**
Mw:	(Molecular Weight,lb/lb-mole,wet)	25.85	26.33	25.79	**25.99**
D:	(Duct diameter, in.)	118.00	118.00	118.00	**118.00**
A:	(Duct area, sq. ft.)	75.95	75.95	75.95	**75.95**
Ts:	(Stack temperature, °F)	146.2	146.4	146.5	**146.4**
Dn:	(Nozzle diameter, in.)	0.380	0.380	0.380	***0.380***
An:	(Nozzle area, ft2)	7.88E-04	7.88E-04	7.88E-04	***7.88E-04***
Pg:	(Static pressure of flue gas, in. H_2O)	0.2	0.2	0.2	**0.20**
Ps:	(Absolute stack gas pressure, in. Hg)	24.51	24.51	24.51	**24.51**
Cp:	(Pitot tube coefficient)	0.84	0.84	0.84	**0.84**
ΔP:	(Average velocity head, in. H_2O)	0.0740	0.078	0.080	**0.077**
Vs:	(Gas velocity, ft./second)	19.1	19.4	19.9	**19.5**
ACFM:	(Actual cubic feet/min., wet)	87039	88406	90684	**88710**
SCFM	(Std. cubic ft/min., wet)	62149	63104	64720	**63324**
SDCFM:	(Std.* cubic feet/min., dry)	44776	48239	46305	**46440**
% Iso:	(Isokinetic variation)	101.7	98.9	102.1	***100.9***

Generic Any Materials
Default Subreport 1

			GRAVIMETRIC P2O5	SP.G. OP	TJA ACID+PROJ		
			Grav P2O5	Specific Gravity	Averaged P2O5	P2O5	P2O5v
			wt.%	none	wt.%	wt.%	wt.%
Sample Date/Time	User Sample ID	Sample ID	(AVG)	(AVG)	(AVG)	(AVG)	(AVG)
4/14/2005 23:50	PHOSFEED	200108269		1.59	46	46.5	45.4

15min		04FIC041/PID1/PV.CV 42% ACID TO PRENEUT TANK GPM		24FIC009101/PID1/PV.CV GRANULATOR TRIM ACID GPM		
4/15/2005	15-Apr-05 00:00:00	179.88		9.69		
4/16/2005	15-Apr-05 00:15:00	179.57		9.90		
	15-Apr-05 00:30:00	179.83		9.87		
	15-Apr-05 00:45:00	179.56		9.63		
	15-Apr-05 01:00:00	179.42		9.39		
	15-Apr-05 01:15:00	179.15		9.31		
	15-Apr-05 01:30:00	180.18		9.72		
	15-Apr-05 01:45:00	180.64		9.81		
	15-Apr-05 02:00:00	180.90		9.81		
	15-Apr-05 02:15:00	180.85		9.80		
	15-Apr-05 02:30:00	180.06		9.79		
	15-Apr-05 02:45:00	179.61		9.79		
	15-Apr-05 03:00:00	179.23		9.78		
	15-Apr-05 03:15:00	164.08		10.34		
	15-Apr-05 03:30:00	60.72		6.20		
	15-Apr-05 03:45:00	60.01		0.03		
	15-Apr-05 04:00:00	59.89		-0.01		
	15-Apr-05 04:15:00	59.77		-0.06		
	15-Apr-05 04:30:00	59.64		-0.10		
	15-Apr-05 04:45:00	59.52		-0.15		
	15-Apr-05 05:00:00	59.40		-0.20		
	15-Apr-05 05:15:00	59.28		-0.24		
	15-Apr-05 05:30:00	106.42		-0.29		
	15-Apr-05 05:45:00	114.36		-0.33		
	15-Apr-05 06:00:00	82.52		5.64		
	15-Apr-05 06:15:00	153.21		11.34		
	15-Apr-05 06:30:00	200.69		12.29		
	15-Apr-05 06:45:00	220.50		12.53		
	15-Apr-05 07:00:00	221.26		12.83		
	15-Apr-05 07:15:00	226.62		12.47		
	15-Apr-05 07:30:00	228.75		12.45		
	15-Apr-05 07:45:00	229.39		12.46		
	15-Apr-05 08:00:00	229.39		12.64		
	15-Apr-05 08:15:00	229.77		12.27		
	15-Apr-05 08:30:00	230.25		11.89		
	15-Apr-05 08:45:00	230.73		11.73		
	15-Apr-05 09:00:00	230.19		11.81		
	15-Apr-05 09:15:00	229.18	230	11.90	12	242
	15-Apr-05 09:30:00	229.55		12.14		
	15-Apr-05 09:45:00	230.28		12.48		
	15-Apr-05 10:00:00	230.41		12.56		
	15-Apr-05 10:15:00	230.56		12.51		
	15-Apr-05 10:30:00	230.66		12.47		
	15-Apr-05 10:45:00	230.55		12.42		
	15-Apr-05 11:00:00	230.45		12.37		
	15-Apr-05 11:15:00	230.49		12.32		

15-Apr-05 11:30:00	230.44	231	12.27	12	243
15-Apr-05 11:45:00	229.71		12.23		
15-Apr-05 12:00:00	229.77		12.18		
15-Apr-05 12:15:00	229.84		12.13		
15-Apr-05 12:30:00	229.92		12.08		
15-Apr-05 12:45:00	230.00		12.03		
15-Apr-05 13:00:00	230.07		11.98		
15-Apr-05 13:15:00	230.15		11.94		
15-Apr-05 13:30:00	230.22	230	11.91	12	242
15-Apr-05 13:45:00	230.30		11.96		
15-Apr-05 14:00:00	230.38		12.01		

Granulation Plant Granulator Scrubber Flow and Pressure Drop

15min		04FIC022105/PID1/PV.CV GRAN SCRUBBER ACID gpm		24PDI093105/AI1/PV.CV GRAN/AMMONIA SCRUBBER D/P in. H2O	
4/15/2005					
4/16/2005					
	15-Apr-05 00:00:00	375.02		17.71	
	15-Apr-05 00:15:00	374.99		18.16	
	15-Apr-05 00:30:00	374.97		17.82	
	15-Apr-05 00:45:00	374.94		17.80	
	15-Apr-05 01:00:00	374.91		17.95	
	15-Apr-05 01:15:00	374.95		18.18	
	15-Apr-05 01:30:00	375.03		17.59	
	15-Apr-05 01:45:00	375.10		17.39	
	15-Apr-05 02:00:00	375.18		17.45	
	15-Apr-05 02:15:00	375.26		17.60	
	15-Apr-05 02:30:00	375.34		17.70	
	15-Apr-05 02:45:00	375.42		17.53	
	15-Apr-05 03:00:00	375.49		17.42	
	15-Apr-05 03:15:00	375.57		16.92	
	15-Apr-05 03:30:00	375.65		11.95	
	15-Apr-05 03:45:00	375.73		8.15	
	15-Apr-05 04:00:00	375.81		7.81	
	15-Apr-05 04:15:00	375.88		7.35	
	15-Apr-05 04:30:00	375.96		7.13	
	15-Apr-05 04:45:00	376.04		7.05	
	15-Apr-05 05:00:00	376.12		7.11	
	15-Apr-05 05:15:00	376.09		7.79	
	15-Apr-05 05:30:00	376.00		9.99	
	15-Apr-05 05:45:00	375.91		11.15	
	15-Apr-05 06:00:00	375.82		14.56	
	15-Apr-05 06:15:00	375.73		18.90	
	15-Apr-05 06:30:00	375.64		19.60	
	15-Apr-05 06:45:00	375.56		19.55	
	15-Apr-05 07:00:00	375.62		19.53	
	15-Apr-05 07:15:00	375.72		19.39	
	15-Apr-05 07:30:00	375.81		19.60	
	15-Apr-05 07:45:00	375.91		19.70	
	15-Apr-05 08:00:00	376.00		19.57	
	15-Apr-05 08:15:00	376.10		19.05	
	15-Apr-05 08:30:00	376.19		18.83	
	15-Apr-05 08:45:00	376.29		19.31	
	15-Apr-05 09:00:00	376.37		19.47	
	15-Apr-05 09:15:00	376.28	376	19.36	19.26
	15-Apr-05 09:30:00	376.10		19.46	
	15-Apr-05 09:45:00	375.94		19.12	
	15-Apr-05 10:00:00	375.79		19.13	

15-Apr-05 10:15:00	375.64		17.55	
15-Apr-05 10:30:00	375.49		18.39	
15-Apr-05 10:45:00	375.33		17.61	
15-Apr-05 11:00:00	375.18		17.80	
15-Apr-05 11:15:00	375.03		18.37	
15-Apr-05 11:30:00	374.88	375	17.40	17.85
15-Apr-05 11:45:00	374.73		18.16	
15-Apr-05 12:00:00	374.58		18.54	
15-Apr-05 12:15:00	374.43		18.41	
15-Apr-05 12:30:00	374.28		18.67	
15-Apr-05 12:45:00	374.13		19.00	
15-Apr-05 13:00:00	373.98		18.21	
15-Apr-05 13:15:00	373.82		18.83	
15-Apr-05 13:30:00	373.67	374	18.74	18.64
15-Apr-05 13:45:00	373.66		18.68	
15-Apr-05 14:00:00	373.78	Average =	18.67	Average =
15-Apr-05 14:15:00	373.89	375	19.11	18.59
15-Apr-05 14:30:00	374.01		19.47	
15-Apr-05 14:45:00	374.12		19.93	
15-Apr-05 15:00:00	374.23		19.85	
15-Apr-05 15:15:00	374.35		18.65	
15-Apr-05 15:30:00	374.46		18.57	
15-Apr-05 15:45:00	374.53		18.89	
15-Apr-05 16:00:00	374.57		17.20	
15-Apr-05 16:15:00	374.61		17.65	
15-Apr-05 16:30:00	374.65		17.56	
15-Apr-05 16:45:00	374.68		18.82	
15-Apr-05 17:00:00	374.72		19.21	
15-Apr-05 17:15:00	374.76		19.59	
15-Apr-05 17:30:00	374.80		20.17	
15-Apr-05 17:45:00	374.84		19.47	
15-Apr-05 18:00:00	374.87		18.41	
15-Apr-05 18:15:00	374.91		18.60	
15-Apr-05 18:30:00	374.95		15.50	
15-Apr-05 18:45:00	374.99		12.19	
15-Apr-05 19:00:00	375.02		11.41	
15-Apr-05 19:15:00	375.06		11.46	
15-Apr-05 19:30:00	375.10		10.10	
15-Apr-05 19:45:00	375.15		9.35	
15-Apr-05 20:00:00	375.20		9.19	
15-Apr-05 20:15:00	375.25		8.73	
15-Apr-05 20:30:00	375.31		8.50	
15-Apr-05 20:45:00	375.36		8.34	
15-Apr-05 21:00:00	375.42		8.19	
15-Apr-05 21:15:00	375.47		8.58	
15-Apr-05 21:30:00	375.53		9.02	
15-Apr-05 21:45:00	375.58		9.36	
15-Apr-05 22:00:00	375.63		9.76	
15-Apr-05 22:15:00	375.69		10.25	
15-Apr-05 22:30:00	375.74		11.38	
15-Apr-05 22:45:00	375.80		11.91	
15-Apr-05 23:00:00	375.85		11.88	

15-Apr-05 23:15:00	375.91	11.85
15-Apr-05 23:30:00	375.96	12.21
15-Apr-05 23:45:00	375.81	11.88

Granulation Plant Dryer Scrubber Flow and Pressure Drop

15min		04FIC014105/PID1/PV.CV DRYER SCRUBBER FLOW gpm		24PDI094105/AI1/PV.CV DRYER SCRUBBER D/P in. H2O	
4/15/2005					
4/16/2005					
	15-Apr-05 00:00:00	727.09		18.33	
	15-Apr-05 00:15:00	726.41		18.14	
	15-Apr-05 00:30:00	725.73		18.25	
	15-Apr-05 00:45:00	725.06		18.46	
	15-Apr-05 01:00:00	724.88		18.45	
	15-Apr-05 01:15:00	724.66		18.46	
	15-Apr-05 01:30:00	724.41		18.28	
	15-Apr-05 01:45:00	724.16		18.45	
	15-Apr-05 02:00:00	723.91		18.16	
	15-Apr-05 02:15:00	723.66		18.37	
	15-Apr-05 02:30:00	723.40		19.00	
	15-Apr-05 02:45:00	723.15		18.47	
	15-Apr-05 03:00:00	722.90		18.26	
	15-Apr-05 03:15:00	722.65		18.37	
	15-Apr-05 03:30:00	722.40		18.26	
	15-Apr-05 03:45:00	722.15		17.81	
	15-Apr-05 04:00:00	721.90		17.50	
	15-Apr-05 04:15:00	723.46		17.30	
	15-Apr-05 04:30:00	725.97		17.71	
	15-Apr-05 04:45:00	726.00		17.09	
	15-Apr-05 05:00:00	726.03		16.11	
	15-Apr-05 05:15:00	726.06		16.62	
	15-Apr-05 05:30:00	726.09		17.44	
	15-Apr-05 05:45:00	726.12		17.52	
	15-Apr-05 06:00:00	726.14		16.97	
	15-Apr-05 06:15:00	726.17		17.54	
	15-Apr-05 06:30:00	726.20		18.04	
	15-Apr-05 06:45:00	726.23		18.01	
	15-Apr-05 07:00:00	726.26		18.08	
	15-Apr-05 07:15:00	726.29		18.01	
	15-Apr-05 07:30:00	726.32		17.94	
	15-Apr-05 07:45:00	726.35		16.21	
	15-Apr-05 08:00:00	726.38		16.31	
	15-Apr-05 08:15:00	726.39		17.49	
	15-Apr-05 08:30:00	726.13		17.30	
	15-Apr-05 08:45:00	725.80		16.26	
	15-Apr-05 09:00:00	725.48		16.24	
	15-Apr-05 09:15:00	725.15	726	16.63	16.70
	15-Apr-05 09:30:00	724.83		16.74	
	15-Apr-05 09:45:00	724.50		16.77	
	15-Apr-05 10:00:00	724.17		15.75	

15-Apr-05 10:15:00	723.85		16.90	
15-Apr-05 10:30:00	723.52		16.42	
15-Apr-05 10:45:00	723.19		16.61	
15-Apr-05 11:00:00	723.15		16.26	
15-Apr-05 11:15:00	724.87		16.71	
15-Apr-05 11:30:00	725.44	724	18.17	16.84
15-Apr-05 11:45:00	725.44		16.22	
15-Apr-05 12:00:00	725.43		16.05	
15-Apr-05 12:15:00	725.43		15.84	
15-Apr-05 12:30:00	725.43		16.45	
15-Apr-05 12:45:00	725.43		16.63	
15-Apr-05 13:00:00	725.43		16.07	
15-Apr-05 13:15:00	725.43		15.55	
15-Apr-05 13:30:00	725.42	725	16.59	16.19
15-Apr-05 13:45:00	725.42		17.08	
15-Apr-05 14:00:00	725.42	Average =	16.09	Average =
15-Apr-05 14:15:00	725.42	725	16.11	16.58
15-Apr-05 14:30:00	725.42		16.12	
15-Apr-05 14:45:00	725.42		17.60	
15-Apr-05 15:00:00	725.42		16.59	
15-Apr-05 15:15:00	725.41		16.66	
15-Apr-05 15:30:00	725.42		17.16	
15-Apr-05 15:45:00	725.43		17.78	
15-Apr-05 16:00:00	725.44		18.67	
15-Apr-05 16:15:00	725.45		17.88	
15-Apr-05 16:30:00	725.46		18.11	
15-Apr-05 16:45:00	725.46		18.70	
15-Apr-05 17:00:00	725.47		18.88	
15-Apr-05 17:15:00	725.48		18.81	
15-Apr-05 17:30:00	725.49		18.90	
15-Apr-05 17:45:00	725.50		18.86	
15-Apr-05 18:00:00	725.51		18.83	
15-Apr-05 18:15:00	725.52		18.86	
15-Apr-05 18:30:00	725.52		19.11	
15-Apr-05 18:45:00	725.53		16.50	
15-Apr-05 19:00:00	725.54		15.62	
15-Apr-05 19:15:00	725.51		15.00	
15-Apr-05 19:30:00	725.05		14.44	
15-Apr-05 19:45:00	724.87		14.55	
15-Apr-05 20:00:00	726.23		13.86	
15-Apr-05 20:15:00	726.22		13.95	
15-Apr-05 20:30:00	726.20		13.86	
15-Apr-05 20:45:00	726.19		14.17	
15-Apr-05 21:00:00	726.17		14.32	
15-Apr-05 21:15:00	726.16		13.33	
15-Apr-05 21:30:00	726.14		12.94	
15-Apr-05 21:45:00	726.13		12.75	
15-Apr-05 22:00:00	726.11		9.13	
15-Apr-05 22:15:00	726.10		8.26	
15-Apr-05 22:30:00	726.08		8.18	
15-Apr-05 22:45:00	726.07		8.32	
15-Apr-05 23:00:00	726.05		8.39	

15-Apr-05 23:15:00	726.04	8.02
15-Apr-05 23:30:00	726.02	7.40
15-Apr-05 23:45:00	726.00	7.95

Client: A012 - AES
Report Number: 05-095

Lab ID: 05-M247
Client ID: Run 1
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	11,600	50.0	µg/sample

Lab ID: 05-M248
Client ID: Run 2
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	6,430	50.0	µg/sample

Lab ID: 05-M249
Client ID: Run 3
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	19,400	50.0	µg/sample

Agrium CPO/Nu-West Ind.

Agrium CPO

Compliance Report

Phosphate Fertilizer Production Plant

Test Dates:
April 15, 2005
to
April 15, 2005

Project Number: AES5041

Tested By:

Antec Environmental Services

PO Box 2117
North Bend, WA 98045
(425) 888-2202
antec@earthlink.net

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Source Test Certification

Emission Source Owner: Agrium CPO/Nu-West Ind.
3010 Conda Road
Soda Springs, Idaho

Contact: Mr. Monty Johnson
Title: Environmental Manager
Phone: (208) 547-4381
E-mail: mrjohnso@agrium.com

Permit No.: 029-0003

Date Tested	Emission Units Tested
April 15, 2005	Phosphate Fertilizer Production Plant

Project Number: AES5041

Testing Firm: Antec Environmental Services
Address: PO Box 2117
CityStateZip: North Bend, WA 98045
E-Mail: antec@earthlink.net
Phone: (425) 888-2202
Fax: (425) 888-2321

The data and results presented in this report are, to the best of my knowledge, accurate and complete:

By: _____
Eric E. Olson
Project Manager

Introduction

On April 15, 2005, Antec Environmental Services performed a compliance test for Agrium Conda Phosphate Operations, located in Soda Springs, Idaho. The sources and the emissions determined can be found in Table 1. Supporting data for the Summary of Results can be found in the appendices of this report. The purpose of the testing was to quantify fluoride emissions from the Phosphate Fertilizer Production Plant and comply with permit conditions.

Personnel

Participants involved in the testing program are listed below with their affiliation:

Agrium CPO/Nu-West Ind.	Antec Environmental Services
Mr. Monty Johnson Environmental Manager (208) 547-4381 E-mail:mrjohnso@agrium.com	**Project Manager** Eric E. Olson (425) 888-2202 E-mail:antec@earthlink.net
Mr. Clay Gentry Environmental Technician (208) 547-4381 E-mail: cgentry@agrium.com	

Sources & Emission Parameters

Table 1 Source	Date Tested	Test Method	Emission Parameters
Phosphate Fertilizer Production Plant	April 15, 2005	EPA 1-4, 5,13b	Particulate Matter, Volumetric Flow, Fluorides

Summary of Results

Phosphate Fertilizer Production Plant Fluoride

April 15, 2005	Run 1	Run 2	Run 3	Three Run Average
Start Time	754	1018	1220	
End Time	913	1131	1334	
Actual Cubic ft./min(ACFM)	87,039	88,406	90,684	**88,710**
Dry Standard Cubic ft./min(DSCFM)	44,776	48,239	46,305	**46,440**
% Oxygen	20.12	20.09	19.99	**20.07**
% Opacity	0	0	0	**0.0**
Fluoride mg/dscf	0.3413	0.1806	0.5501	**0.3573**
Fluoride lbs/hr	2.02	1.15	3.37	**2.18**

Methodology

The following EPA reference methods were used during the emission testing project. The respective summaries outline each method and any deviations encountered.

EPA 1-4

EPA Methods 1 and 2 are used to measure volumetric flow rates. EPA Method 1 is used to locate the representative sample points within the stack area. The cross-sectional area of the stack is divided into a number of equal areas. Sample traverse points are then located within each of these equal areas. EPA Method 2 is used to measure average stack gas velocity using a calibrated type "S" pitot tube connected to an incline oil manometer. Stack temperature is measured simultaneously using a calibrated type "K" thermocouple. A sample of the gas stream is extracted, dried, and gas volume metered using an EPA Method 13b sample train. The weight gain of condensed moisture is then measured by volume. The percentage of moisture is used to calculate the dry molecular weight of the stack gas and correct wet volume measurements to a dry volume basis.

Molecular Weight, EPA Method 3a

A sample was continuously extracted from the effluent stream, dried, and conveyed to calibrated analyzers for determination of O_2 & CO2 concentration.

EPA 13b

A series of preliminary measurements was made prior to conducting the test. EPA Methods 1, 2, 3, and ODEQ 4 (Tw/Td) were performed to determine location and number of traverse points, average gas velocity and pressure, and gas molecular weight. The percentage of water was measured by a preliminary wet-bulb dry-bulb test. The results of these measurements were entered into the field computer and an appropriate nozzle size for isokinetic sampling was determined.
The sample system consisted of a probe, filter, and impinger train. The probe consisted of a type "S" pitot tube, sample nozzle, and thermocouple. Sample gas was collected through a borosilicate probe & nozzle, dried in a series of chilled impingers, with a back-up filter placed between the knock-out and silica gel impinger. The volume of sample gas collected was measured using a dry-gas meter and calibrated-restriction orifice.

AGR_009720

Sample apparatus was prepared on-site in the mobile laboratory. The absorption train was charged with 100 milliliters of distilled water in each of the first two impingers while the knock-out impinger remained empty, weighed on a calibrated digital balance to the nearest 0.1 grams, and assembled. The probe was brushed out and rinsed with water and the filter holder charged. The sampling apparatus was assembled and leak tested at ten inches of vacuum. The probe was placed at the first traverse point of the stack sample port. The vacuum pump was started immediately and adjusted to obtain an isokinetic sample rate.

The traverse points were sampled for the appropriate time for 72 minutes. A minimum of 31.8 standard cubic feet was collected or the amount specified in the applicable subpart, whichever was greater. Duct conditions (temperature, differential pressure) and sampling conditions (meter temperature; volume and pressure; probe, filter, sample line and impinger temperatures; and absorption trains vacuums) were monitored and recorded regularly for each traverse sample point. Upon completion of sampling, a final leak check was performed on the sampling apparatus at a vacuum greater than the highest observed vacuum during the test.

The absorption train was inspected for abnormalities and disassembled. The impingers were weighed on a digital balance for use in determining percent moisture. The filter was carefully removed from the filter holder with forceps. It was then placed in a nalgene sample bottle. The sample fractions were combined, bottled, labeled, and fluid-level marked for transportation to the laboratory. An Aliquot of deionized water was similarly treated for blank analysis.

references

Handbook for Air Pollution Measurement Systems. US Environmental Protection Agency. Publication EPA-600/4-77-0276 Volume 3, June, 1979.

Quality Assurance Handbook for Air Pollution Measurement Systems. US Environmental Protection Agency EPA 600/4-77-0276 Volume 3, September, 1982.

US Environmental Protection Agency. 1996. 40 CFR Part 60, Appendix A, Methods 1, 2, 3a, 4a, and 20. *Federal Register*, (July 1).

Phosphate Fertilizer Production Plant

Calculation of Average Emissions

Test Performed For:
Agrium
Soda Springs
Granulator
O2, CO2
Date:4/15/05

Test Performed By:
AES
Field Test
Trailer #1

Run 1

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 percent O2	0.00 %	0.01 %	0.01
22.50 percent O2	22.46 %	22.48 %	22.47
0.00 percent CO2	0.04 %	0.02 %	0.03
19.00 percent CO2	19.05 %	19.03 %	19.04

Mean Reference Values:	**Corrected Results:**	**Basis:**
20.10 percent O2	**20.12** percent O2	DRY
0.53 percent CO2	**0.53** percent CO2	DRY

Date:4/15/05

Run 2

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 percent O2	0.01 %	0.06 %	0.03
22.50 percent O2	22.48 %	22.55 %	22.52
0.00 percent CO2	0.02 %	0.02 %	0.02
19.00 percent CO2	19.03 %	19.13 %	19.08

Mean Reference Values:	**Corrected Results:**	**Basis:**
20.11 percent O2	**20.09** percent O2	DRY
0.54 percent CO2	**0.54** percent CO2	DRY

Date:4/15/05

Run 3

Calibration Gas Value	Initial Calibration	Final Calibration	Average
0.00 percent O2	0.06 %	0.03 %	0.04
22.50 percent O2	22.55 %	22.50 %	22.53
0.00 percent CO2	0.02 %	0.01 %	0.01
19.00 percent CO2	19.13 %	18.99 %	19.06

Mean Reference Values:	**Corrected Results:**	**Basis:**
20.02 percent O2	**19.99** percent O2	DRY
0.52 percent CO2	**0.52** percent CO2	DRY

Sampling System Bias and Drift

Test Performed For:
Agrium
Soda Springs
Granulator
O2, CO2
Date:4/15/05

Test Performed By:
AES
Field Test
Trailer #1

Run 1

Monitor Type	Analyzer Cal Response	Initial Cal Value	Pre Run Bias (%)	Final Cal Value	Post Run Bias (%)	Total Run Drift (%)
O2	-0.02 %	0.00 %	0.08 %	0.01 %	0.12 %	0.04 %
O2	22.55 %	22.46 %	-0.36 %	22.48 %	-0.28 %	0.08 %
CO2	0.02 %	0.04 %	0.10 %	0.02 %	0.00 %	-0.10 %
CO2	19.05 %	19.05 %	0.00 %	19.03 %	-0.10 %	-0.10 %

Date:4/15/05

Run 2

Monitor Type	Analyzer Cal Response	Initial Cal Value	Pre Run Bias (%)	Final Cal Value	Post Run Bias (%)	Total Run Drift (%)
O2	-0.02 %	0.01 %	0.12 %	0.06 %	0.32 %	0.20 %
O2	22.55 %	22.48 %	-0.28 %	22.55 %	0.00 %	0.28 %
CO2	0.02 %	0.02 %	0.00 %	0.02 %	0.00 %	0.00 %
CO2	19.05 %	19.03 %	-0.10 %	19.13 %	0.40 %	0.50 %

Date:4/15/05

Run 3

Monitor Type	Analyzer Cal Response	Initial Cal Value	Pre Run Bias (%)	Final Cal Value	Post Run Bias (%)	Total Run Drift (%)
O2	-0.02 %	0.06 %	0.32 %	0.03 %	0.20 %	-0.12 %
O2	22.55 %	22.55 %	0.00 %	22.50 %	-0.20 %	-0.20 %
CO2	0.02 %	0.02 %	0.00 %	0.01 %	-0.05 %	-0.05 %
CO2	19.05 %	19.13 %	0.40 %	18.99 %	-0.30 %	-0.70 %

Analyzer Calibration Error

Test Performed For:
Agrium
Soda Springs
Granulator
O2, CO2
Date:4/15/05

Test Performed By:
AES
Field Test
Trailer #1

Run 1

Oxygen Monitor

Method 3A

Full Scale: 25.00 %

Serial Number: 2 E2-301A

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
Nitrogen Zero/cg1	0.00 %	-0.02 %	-0.02 %	-0.08 %
CC53983/cg3	12.50 %	12.59 %	0.09 %	0.36 %
CC109232/cg2	22.50 %	22.55 %	0.05 %	0.20 %

Carbon Dioxide Monitor

Method 20

Full Scale: 20.00 %

Serial Number: 1 7MB1122

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference	Calibration Error (%)
Nitrogen Zero/cg1	0.00 %	0.02 %	0.02 %	0.10 %
CC53983/cg3	9.98 %	10.09 %	0.11 %	0.55 %
CC109232/cg2	19.00 %	19.05 %	0.05 %	0.25 %

One Minute Data

Run No.	Date	Time	O2	CO2	Run No.	Date	Time	O2	CO2
1	4/15/05	7:54:00	20.86	0.08	1	4/15/05	8:43:00	19.97	0.62
1	4/15/05	7:55:00	20.85	0.08	1	4/15/05	8:44:00	19.95	0.63
1	4/15/05	7:56:00	20.83	0.11	1	4/15/05	8:45:00	19.96	0.63
1	4/15/05	7:57:00	20.85	0.08	1	4/15/05	8:46:00	19.95	0.63
1	4/15/05	7:58:00	20.47	0.29	1	4/15/05	8:47:00	19.95	0.63
1	4/15/05	7:59:00	20.01	0.55	1	4/15/05	8:48:00	19.96	0.63
1	4/15/05	8:00:00	19.95	0.59	1	4/15/05	8:49:00	19.96	0.63
1	4/15/05	8:01:00	19.92	0.60	1	4/15/05	8:50:00	19.96	0.63
1	4/15/05	8:02:00	19.93	0.62	1	4/15/05	8:51:00	19.96	0.63
1	4/15/05	8:03:00	19.92	0.62	1	4/15/05	8:52:00	19.95	0.64
1	4/15/05	8:04:00	20.46	0.28	1	4/15/05	8:53:00	19.94	0.64
1	4/15/05	8:05:00	20.78	0.12	1	4/15/05	8:54:00	19.95	0.63
1	4/15/05	8:06:00	20.85	0.08	1	4/15/05	8:55:00	19.96	0.63
1	4/15/05	8:07:00	20.83	0.10	1	4/15/05	8:56:00	19.97	0.62
1	4/15/05	8:08:00	20.11	0.53	1	4/15/05	8:57:00	19.97	0.62
1	4/15/05	8:09:00	19.93	0.61	1	4/15/05	8:58:00	19.97	0.63
1	4/15/05	8:10:00	19.95	0.60	1	4/15/05	8:59:00	19.97	0.60
1	4/15/05	8:11:00	19.93	0.61	1	4/15/05	9:00:00	19.97	0.58
1	4/15/05	8:12:00	19.93	0.61	1	4/15/05	9:01:00	19.97	0.59
1	4/15/05	8:13:00	19.96	0.60	1	4/15/05	9:02:00	19.97	0.60
1	4/15/05	8:14:00	19.98	0.59	1	4/15/05	9:03:00	19.97	0.61
1	4/15/05	8:15:00	19.96	0.60	1	4/15/05	9:04:00	19.96	0.62
1	4/15/05	8:16:00	19.95	0.60	1	4/15/05	9:05:00	19.97	0.62
1	4/15/05	8:17:00	19.95	0.60					
1	4/15/05	8:18:00	19.96	0.60					
1	4/15/05	8:19:00	19.97	0.59					
1	4/15/05	8:20:00	19.97	0.59					
1	4/15/05	8:21:00	19.99	0.55					
1	4/15/05	8:22:00	20.23	0.40					
1	4/15/05	8:23:00	20.01	0.53					
1	4/15/05	8:24:00	19.97	0.56					
1	4/15/05	8:25:00	19.97	0.57					
1	4/15/05	8:26:00	19.98	0.57					
1	4/15/05	8:27:00	19.99	0.58					
1	4/15/05	8:28:00	19.99	0.58					
1	4/15/05	8:29:00	19.99	0.59					
1	4/15/05	8:30:00	19.98	0.59					
1	4/15/05	8:31:00	19.97	0.60					
1	4/15/05	8:32:00	19.95	0.61					
1	4/15/05	8:33:00	19.91	0.63					
1	4/15/05	8:34:00	20.57	0.22					
1	4/15/05	8:35:00	20.87	0.10					
1	4/15/05	8:36:00	20.07	0.58					
1	4/15/05	8:37:00	19.95	0.62					
1	4/15/05	8:38:00	19.95	0.62					
1	4/15/05	8:39:00	20.68	0.17					
1	4/15/05	8:40:00	20.69	0.23					
1	4/15/05	8:41:00	19.99	0.62					
1	4/15/05	8:42:00	19.98	0.61					

One Minute Data

Run No.	Date	Time	O2	CO2	Run No.	Date	Time	O2	CO2
2	4/15/05	10:18:00	20.25	0.38	2	4/15/05	11:08:00	20.10	0.56
2	4/15/05	10:19:00	20.03	0.52	2	4/15/05	11:09:00	20.10	0.55
2	4/15/05	10:20:00	19.98	0.57	2	4/15/05	11:10:00	20.10	0.55
2	4/15/05	10:21:00	19.96	0.58	2	4/15/05	11:11:00	20.10	0.55
2	4/15/05	10:22:00	19.94	0.59	2	4/15/05	11:12:00	20.10	0.56
2	4/15/05	10:23:00	19.97	0.58	2	4/15/05	11:13:00	20.10	0.55
2	4/15/05	10:24:00	19.99	0.57	2	4/15/05	11:14:00	20.11	0.54
2	4/15/05	10:25:00	20.01	0.57	2	4/15/05	11:15:00	20.12	0.53
2	4/15/05	10:26:00	20.03	0.56	2	4/15/05	11:16:00	20.13	0.53
2	4/15/05	10:27:00	20.03	0.56	2	4/15/05	11:17:00	20.15	0.52
2	4/15/05	10:28:00	20.02	0.57	2	4/15/05	11:18:00	20.17	0.52
2	4/15/05	10:29:00	20.03	0.57	2	4/15/05	11:19:00	20.18	0.51
2	4/15/05	10:30:00	20.03	0.58	2	4/15/05	11:20:00	20.17	0.52
2	4/15/05	10:31:00	20.06	0.56	2	4/15/05	11:21:00	20.15	0.53
2	4/15/05	10:32:00	20.06	0.56	2	4/15/05	11:22:00	20.14	0.53
2	4/15/05	10:33:00	20.07	0.55	2	4/15/05	11:23:00	20.16	0.53
2	4/15/05	10:34:00	20.08	0.55	2	4/15/05	11:24:00	20.16	0.53
2	4/15/05	10:35:00	20.08	0.56	2	4/15/05	11:25:00	20.17	0.53
2	4/15/05	10:36:00	20.08	0.56	2	4/15/05	11:26:00	20.18	0.53
2	4/15/05	10:37:00	20.07	0.54	2	4/15/05	11:27:00	20.18	0.53
2	4/15/05	10:38:00	20.07	0.55	2	4/15/05	11:28:00	20.18	0.52
2	4/15/05	10:39:00	20.06	0.55	2	4/15/05	11:29:00	20.19	0.52
2	4/15/05	10:40:00	20.05	0.56					
2	4/15/05	10:41:00	20.05	0.56					
2	4/15/05	10:42:00	20.04	0.57					
2	4/15/05	10:43:00	20.05	0.57					
2	4/15/05	10:44:00	20.06	0.57					
2	4/15/05	10:45:00	20.06	0.56					
2	4/15/05	10:46:00	20.07	0.56					
2	4/15/05	10:47:00	20.07	0.56					
2	4/15/05	10:48:00	20.07	0.57					
2	4/15/05	10:49:00	20.08	0.56					
2	4/15/05	10:50:00	20.08	0.56					
2	4/15/05	10:51:00	20.08	0.56					
2	4/15/05	10:52:00	20.07	0.57					
2	4/15/05	10:53:00	20.28	0.43					
2	4/15/05	10:54:00	20.93	0.09					
2	4/15/05	10:55:00	20.46	0.38					
2	4/15/05	10:56:00	20.10	0.54					
2	4/15/05	10:57:00	20.11	0.56					
2	4/15/05	10:58:00	20.12	0.56					
2	4/15/05	10:59:00	20.11	0.55					
2	4/15/05	11:00:00	20.10	0.56					
2	4/15/05	11:01:00	20.10	0.56					
2	4/15/05	11:02:00	20.11	0.55					
2	4/15/05	11:03:00	20.12	0.55					
2	4/15/05	11:04:00	20.10	0.55					
2	4/15/05	11:05:00	20.08	0.56					
2	4/15/05	11:06:00	20.08	0.56					
2	4/15/05	11:07:00	20.09	0.56					

One Minute Data

Run No.	Date	Time	O2	CO2	Run No.	Date	Time	O2	CO2
3	4/15/05	12:20:00	20.83	0.07	3	4/15/05	13:10:00	19.93	0.57
3	4/15/05	12:21:00	20.82	0.09	3	4/15/05	13:11:00	19.94	0.55
3	4/15/05	12:22:00	20.84	0.07	3	4/15/05	13:12:00	19.95	0.55
3	4/15/05	12:23:00	20.83	0.07	3	4/15/05	13:13:00	19.94	0.55
3	4/15/05	12:24:00	20.45	0.29	3	4/15/05	13:14:00	19.94	0.56
3	4/15/05	12:25:00	20.06	0.49	3	4/15/05	13:15:00	19.95	0.55
3	4/15/05	12:26:00	20.03	0.52	3	4/15/05	13:16:00	19.95	0.55
3	4/15/05	12:27:00	19.98	0.55	3	4/15/05	13:17:00	19.95	0.55
3	4/15/05	12:28:00	19.94	0.57	3	4/15/05	13:18:00	19.90	0.58
3	4/15/05	12:29:00	19.92	0.59	3	4/15/05	13:19:00	19.90	0.58
3	4/15/05	12:30:00	19.93	0.59	3	4/15/05	13:20:00	19.91	0.56
3	4/15/05	12:31:00	19.93	0.58	3	4/15/05	13:21:00	19.91	0.57
3	4/15/05	12:32:00	19.93	0.58	3	4/15/05	13:22:00	19.90	0.58
3	4/15/05	12:33:00	19.94	0.58	3	4/15/05	13:23:00	19.90	0.58
3	4/15/05	12:34:00	19.95	0.57	3	4/15/05	13:24:00	19.91	0.58
3	4/15/05	12:35:00	19.97	0.56	3	4/15/05	13:25:00	19.92	0.58
3	4/15/05	12:36:00	19.99	0.55	3	4/15/05	13:26:00	19.93	0.57
3	4/15/05	12:37:00	19.98	0.55	3	4/15/05	13:27:00	19.95	0.57
3	4/15/05	12:38:00	19.97	0.56	3	4/15/05	13:28:00	19.95	0.57
3	4/15/05	12:39:00	19.96	0.56	3	4/15/05	13:29:00	19.96	0.56
3	4/15/05	12:40:00	19.95	0.57	3	4/15/05	13:30:00	19.95	0.56
3	4/15/05	12:41:00	19.94	0.57	3	4/15/05	13:31:00	19.96	0.56
3	4/15/05	12:42:00	19.95	0.57					
3	4/15/05	12:43:00	19.95	0.55					
3	4/15/05	12:44:00	19.95	0.55					
3	4/15/05	12:45:00	19.96	0.55					
3	4/15/05	12:46:00	19.96	0.55					
3	4/15/05	12:47:00	19.97	0.56					
3	4/15/05	12:48:00	19.96	0.56					
3	4/15/05	12:49:00	19.97	0.56					
3	4/15/05	12:50:00	19.98	0.56					
3	4/15/05	12:51:00	19.98	0.56					
3	4/15/05	12:52:00	19.98	0.56					
3	4/15/05	12:53:00	19.99	0.55					
3	4/15/05	12:54:00	19.98	0.55					
3	4/15/05	12:55:00	19.98	0.56					
3	4/15/05	12:56:00	19.97	0.56					
3	4/15/05	12:57:00	19.96	0.56					
3	4/15/05	12:58:00	19.97	0.56					
3	4/15/05	12:59:00	20.00	0.52					
3	4/15/05	13:00:00	20.74	0.11					
3	4/15/05	13:01:00	20.31	0.39					
3	4/15/05	13:02:00	19.98	0.56					
3	4/15/05	13:03:00	19.97	0.56					
3	4/15/05	13:04:00	19.93	0.57					
3	4/15/05	13:05:00	19.90	0.58					
3	4/15/05	13:06:00	19.91	0.58					
3	4/15/05	13:07:00	19.90	0.58					
3	4/15/05	13:08:00	19.90	0.58					
3	4/15/05	13:09:00	19.90	0.58					

Sample & Traverse Point Determination

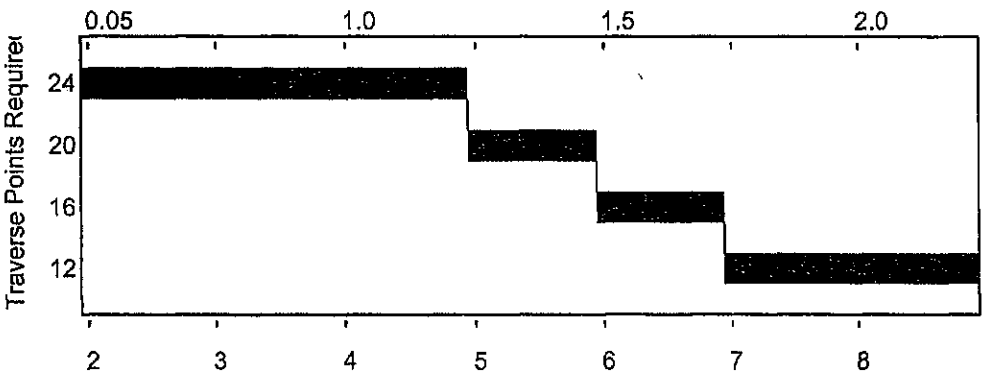
Minimum Number of Traverse Points for Particulate Traverses

EPA Method 1

Client: Agrium CPO/Nu-West Ind.
Location: Soda Springs, ID
Source: Phosphate Fertilizer Production Plant
Date: April 15, 2005
Project No.: AES5041

Stack Diameter(in.): 118
Points Required: 24
Distance A(in.): 59.0
Distance A(dia.): 0.5
Distance B: 708.0
Distance B(dia.): 6.0

Sample Port Location
Duct Diameters upstream from flow disturbance (distance A)



Sample Port Location
Duct Diameters downstream from flow disturbance (distance B)

Traverse Point No.	Number of Traverse Points on a Diameter					*Sample Points*
	4	6	8	10	12	
1	6.7	4.4	3.2	2.6	2.1	***2.5***
2	25.0	14.6	10.5	8.2	6.7	***7.9***
3	75.0	29.6	19.4	14.6	11.8	***13.9***
4	93.3	70.4	32.2	22.6	17.7	***20.9***
5		85.5	67.7	34.2	25	***29.5***
6		95.6	80.6	65.8	35.6	***42.0***
7			89.5	77.4	64.4	***76.0***
8			96.8	85.4	75	***88.5***
9				91.8	82.3	***97.1***
10				97.4	88.2	***104.1***
11					93.3	***110.1***
12					97.9	***115.5***

Granulator EPA 1-4

Client: Agrium
Location: Soda Springs, ID
Source: Granulator
Date: April 15, 2005
Project No.: AES5041

		Run #1	Run #2	Run #3	
		4/15/2005	4/15/2005	4/15/2005	
		754	1018	1220	
		913	1131	1334	**Averages**
Q:	Total sample time[1]:	72	72	72	**72**
Vm:	(Volume,dry gas meter,cf)	39.510	41.975	41.599	**41.028**
Y:	(Dry gas meter calibration factor)	0.995	0.995	0.995	**0.995**
Pbar:	(Barometric pressure,in.Hg)	24.50	24.50	24.50	**24.50**
ΔH:	(Avg. differential pressure,in.H2O)	1.04	1.14	1.11	**1.10**
Tm:	(Avg. meter temperature,°F)	41.4	48.6	48.9	**46.3**
Vm(std.):	(Std.* sample gas volume, DSCF)	33.991	35.611	35.268	**34.957**
Vlc:	(Liquid volume collected,ml)	279.8	232.3	323.3	**278.5**
Vw(std):	(Std.* water vapor volume,scf)	13.170	10.934	15.218	**13.107**
SVP:	(Saturated H_2O vapor pressure, in. Hg	6.92	6.95	6.97	**6.945**
Bwsat:	(Saturated Moisture @ Ts)	0.282	0.283	0.284	**0.283**
Bwsvol	(Volumemetric Moisture content)	0.279	0.235	0.301	**0.272**
Bws:	(SCF H_2O / SCF Total)[2]	0.279	0.235	0.284	**0.266**
%CO_2:	(Carbon Dioxide,% by volume,dry)	0.53	0.54	0.52	**0.53**
%O_2:	(Oxygen,% by volume,dry)	20.12	20.09	19.99	**20.07**
%N_2:	(Nitrogen,% by volume,dry)	79.35	79.37	79.49	**79.40**
Md:	(Molecular Weight,lb/lb-mole,dry)	28.89	28.89	28.88	**28.89**
Mw:	(Molecular Weight,lb/lb-mole,wet)	25.85	26.33	25.79	**25.99**
D:	(Duct diameter, in.)	118.00	118.00	118.00	**118.00**
A:	(Duct area, sq. ft.)	75.95	75.95	75.95	**75.95**
Ts:	(Stack temperature, °F)	146.2	146.4	146.5	**146.4**
Dn:	(Nozzle diameter, in.)	0.380	0.380	0.380	***0.380***
An:	(Nozzle area, ft2)	7.88E-04	7.88E-04	7.88E-04	***7.88E-04***
Pg:	(Static pressure of flue gas, in. H_2O)	0.2	0.2	0.2	**0.20**
Ps:	(Absolute stack gas pressure, in. Hg)	24.51	24.51	24.51	**24.51**
Cp:	(Pitot tube coefficient)	0.84	0.84	0.84	**0.84**
ΔP:	(Average velocity head, in. H_2O)	0.0740	0.078	0.080	**0.077**
Vs:	(Gas velocity, ft./second)	19.1	19.4	19.9	**19.5**
ACFM:	(Actual cubic feet/min., wet)	87039	88406	90684	**88710**
SCFM	(Std. cubic ft/min., wet)	62149	63104	64720	**63324**
SDCFM:	(Std.* cubic feet/min., dry)	44776	48239	46305	**46440**
% Iso:	(Isokinetic variation)	101.7	98.9	102.1	***100.9***

FLUORIDE RESULTS

Client: Agrium
Location: Soda Springs, ID
Source: Granulator
Date: April 15, 2005
Project No.: AES5041

RUN #1

	net mg	blank	mg/dscf	mg/dscf @ 8% O2	lbs/hr
Total F	11.600	0.00	0.3413	5.6003	2.02

RUN #2

	net mg	blank	mg/dscf	mg/dscf @ 8% O2	lbs/hr
Total F	6.430	0.00	0.1806	2.8533	1.15

RUN #3

	net mg	blank	mg/dscf	mg/dscf @ 8% O2	lbs/hr
Total F	19.400	0.00	0.5501	8.6925	3.37

	Mg./dscf	mg/dscf @ 8% O2	lbs/hr
Test Average:	**0.3573**	**5.7154**	**2.18**

Additional Data:

Run	Time start	Time finish	%O2	%CO2	Bws	Vm(std)	sdcfm
1	754	913	20.12	0.53	0.279	33.991	44776
2	1018	1131	20.09	0.54	0.235	35.611	48239
3	1220	1334	19.99	0.52	0.284	35.268	46305

Quality Assurance

Example Equations

Data is from Phosphate Fertilizer Production Plant Run 1 EPA 13b

Absolute pressure in the Stack(P_s)

Where P_{bar} = barometric pressure

P_g = static pressure of the stack

P_s: $P_{bar} + P_g/13.6$

P_s: 24.50+ (0.20/13.6)

P_s: **24.51**

Saturated Vapor Point

Where T_w = Stack Temperature

SVP: $0.00000608764 * T_w^3 - 0.00100431 * T_w^2 + 0.0756026 * T_w - 1.69343$

SVP: $0.00000608764 * 146.2^3 - 0.00100431 * 146.2^2 + 0.0756026 * 146 - 1.69344$

SVP: **6.92**

Moisture(Bws) @ Saturation

Where Tw = Stack Temperature

T_d = Stack temperature

P_s = absolute pressure in the stack

Bws: $(Svp-((0.000367) * P_s * (T_d - T_w) * (1 + ((T_w - 32)/1571))))/P_s$

Bws: (19.16-((0.000367) * 24.51 * (146.2 - 146.2) * (1 + ((146.2 - 32)/1571))))/24.51

Bws: **0.282**

Volume of Metered Sample Gas @ Std. Conditions

Where V_m = Volume, Dry Gas Meter, cubic ft.

K_1 = 17.64 °R/in. Hg

Y = Dry gas meter calibration factor

P_{bar} = Barometric pressure

ΔH = Gas Meter average differential pressure, in. H_2O

T_m = Gas Meter average temperature, °F

$V_{m(std)}$: $K_1 * V_m * Y * (P_{bar} + (\Delta H/13.6))/(T_m + 460)$

$V_{m(std)}$: 17.64 * 39.51 * .995 * (24.50 + (1.04/13.6))/(41.4 + 460)

$V_{m(std)}$: **33.991**

Volume of Water@ Standard Conditions

Where V_{lc} = Impinger liquid volume collected, ml

$V_{w(std)}$: $0.04707 * V_{lc}$

$V_{w(std)}$: 0.04707 * 279.8

$V_{w(std)}$: **13.17**

Moisture(Bws) Volumetric

Where $V_{w(std)}$ = Std. Water vapor volume, scf

$V_{m(std)}$ = Std. Sample gas volume,DSCF

Bws: $V_{w(std)} / (V_{w(std)} + V_{m(std)})$

Bws: 13.17 / (13.17 + 33.991)

Bws: **0.279**

Molecular Weight lb/lb - mole, Dry (M_d)

M_d: $((0.44*\%CO_2)+(0.32*\%O_2)+(0.28*\%N_2)$

M_d: ((0.44*0.53)+(0.32*20.12)+(0.28*79.35)

M_d: **28.89**

Molecular Weight lb/lb - mole, Wet (M_w)

M_w: (M_d * (1-Bws) + (18 * Bws)

M_w: (28.89 * (1-0.279) + (18 *0.279)

M_w: **25.85**

Gas Velocity(V_s)

Where C_p = pitot tube coefficient

T_s = temperature of the stack

M_w = molecular weight lb/lb - mole, wet

Ps = absolute pressure in the stack

V_s: (85.49 * C_p * SQRT(ΔP) * SQRT((T_s + 460)/(P_s * M_w))

V_s: (85.49 * 0.84 * SQRT(.074) * SQRT((146.2 + 460)/(24.51 * 25.85))

V_s: **19.1**

Actual Cubic Feet/Minute (acfm)

Where A = area of the duct in square feet

V_s = Stack gas velocity, ft/sec

acfm: A * V_s * 60

acfm: 75.95 * 19.1 * 60

acfm: **87,039**

Dry Standard Actual Cubic Feet/Minute (dscfm)

Where T_s = temperature of the stack

acfm = actual cubic ft/min

dscfm: (1-(Bws)) * acfm * (528/(T_s + 460)) * (P_s/(29.92))

dscfm: (1-(0.279)) * 87039 * (528/(146.2 + 460)) * (24.51/(29.92))

dscfm: **44,776**

Percent Isokinetic Variation

Where T_s = temperature of the stack

P_s = absolute pressure in the stack

$V_{m(std)}$ = Std. Sample gas volume,DSCF

V_s = Stack gas velocity, ft/sec

A_n = Nozzle area, ft^2

K_4 = 0.0945 constant from EPA method 5

θ = sample time in minutes

%Iso: K_4 * (T_s + 460) * $V_{m(std)}$ / (P_s * V_s * A_n * θ * (1- B_{ws}))

%Iso: 0.0945 * (146.2 + 460) * 33.991 / (24.51 * 19.1 * 7.88e-04* 72 * (1-0.279)

%Iso: **101.7**

Data is from Phosphate Fertilizer Production Plant Run 1 EPA 13b

EPA 13b Fluoride mg/dscf

Where mg = milligrams Fluoride

$V_{m(std)}$ = Std. Sample gas volume,DSCF

mg/dscf: $(mg)/V_{m(std)}$

mg/dscf: (11.6)/33.991

mg/dscf: **0.3413**

EPA M13b Fluoride lbs/hr

Where mg/dscf = milligrams per dscf

DSCFM = Dry Standard Cubic Ft/min

K_f= conversion factor

lbs/hr: mg/dscf * K_f*DSCFM*60

lbs/hr: 0.3413 * 0.0000022046 * 44776 * 60

lbs/hr: **2.02**

AIR LIQUIDE

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Cyl. Number:	Cyl. Pressure:*	Lot Number:
CC109232	2000PSIG	SFS62631
Assay Date:	Expiration Date:	Document Number:
2/23/2004	2/23/2007	12592017
Customer:	P.O. Number:	Item Number:
AIR LIQUIDE TACOMA, WA	SE004043	

*Mixture is valid only to 150 psig

COMPONENT Name	REQUESTED Concentration		ASSAY Concentration			
Carbon Dioxide	19	%	19.0	±	0.3	%
Oxygen	22.5	%	22.5	±	0.3	%
Nitrogen	Balance		Balance			

EPA Protocol
Section No. 2.2, Procedure G-1

REFERENCE STANDARD EMPLOYED FOR ANALYSIS Concentration			Component	Balance	Cyl. No.	SRM NTRM No.	Exp. Date	Sample No.	Type
18.0	± 0.2	%	Carbon Dioxide	Nitrogen	CC 103274	SFS31230	05/08/05	HS	GMIS
21.11	± 0.14	%	Oxygen	Nitrogen	CC 62252	990808	06/27/05	MF	GMIS

Analyst: Eric Barron
Approved by: David Connolly

Carbon Dioxide		Oxygen	
GAS ANALYZER EMPLOYED		GAS ANALYZER EMPLOYED	
Manufacturer:	Varian(B)	Manufacturer:	Varian(B)
Model Number:	3400	Model Number:	3400
Serial Number	2805	Serial Number	2805
MPR Last Calibrated	02/09/04	MPR Last Calibrated:	02/12/04
Analytical Principle:	FID & TCD	Analytical Principle:	FID & TCD

ANALYSIS SUMMARY

	2/23/2004 Triad 1	2/23/2004 Triad 2	2/23/2004 Triad 3	Carbon Dioxide Units
Zero	0	0	0	Area
Reference	10971746	10976583	10953995	Area
Candidate	11534088	11538429	11583008	Area
Result	18.92	18.92	19.03	%
Evaluation	VALID	VALID	VALID	
MEAN ANALYTICAL RESULT:				18.95 %

	2/23/2004 Triad 1	2/23/2004 Triad 2	2/23/2004 Triad 3	Oxygen Units
Zero	0	0	0	Area
Reference	10328839	10393882	10363240	Area
Candidate	11036425	11049496	11086648	Area
Result	22.56	22.44	22.58	%
Evaluation	VALID	VALID	VALID	
MEAN ANALYTICAL RESULT:				22.53 %

Analyst: E. Barron

Approved by: David Connolly

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Phone: (562) 945-1363 • Fax (562) 693-1156

AGR_009736

AIR LIQUIDE

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Cyl. Number:	Cyl. Pressure:*	Lot Number:
CC53983	2000PSIG	SFS02630
Assay Date:	Expiration Date:	Document Number:
3/1/2004	3/1/2007	12592017
Customer:	P.O. Number:	Item Number:
AIR LIQUIDE TACOMA, WA	SE004043	

*Mixture is valid only to 150 psig

COMPONENT Name:	REQUESTED Concentration		ASSAY Concentration		
Carbon Dioxide	10	%	9.98	± 0.11	%
Oxygen	12.5	%	12.5	± 0.1	%
Nitrogen	Balance		Balance		

EPA Protocol
Section No. 2.2, Procedure G-1

Analyst:	Eric Barron
Approved by:	David Connolly

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

Concentration			Component	Balance	SRM Cyl. No.	SRM NTRM No.	SRM Exp. Date	Sample No.	Type
5.006	± 0.026	%	Carbon Dioxide	Nitrogen	CC 62252	990808	06/27/05	MF	GMIS
21.11	± 0.14	%	Oxygen	Nitrogen	CC 62252	990808	06/27/05	MF	GMIS

Carbon Dioxide GAS ANALYZER EMPLOYED		Oxygen GAS ANALYZER EMPLOYED	
Manufacturer:	Varian(B)	Manufacturer:	Varian(B)
Model Number:	3400	Model Number:	3400
Serial Number:	2806	Serial Number:	2806
MPR Last Calibrated:	02/09/04	MPR Last Calibrated:	02/12/04
Analytical Principle:	FID & TCD	Analytical Principle:	FID & TCD

ANALYSIS SUMMARY

	3/1/2004 Triad 1	3/1/2004 Triad 2	3/1/2004 Triad 3	Carbon Dioxide Units
Zero	0	0	0	Area
Reference	1167802	1170848	1166504	Area
Candidate	2330227	2328930	2329212	Area
Result	9.960	9.957	10.00	%
Evaluation	VALID	VALID	VALID	
MEAN ANALYTICAL RESULT				9.981 %

	3/1/2004 Triad 1	3/1/2004 Triad 2	3/1/2004 Triad 3	Oxygen Units
Zero	0	0	0	Area
Reference	3984344	3985538	3983177	Area
Candidate	2350660	2349521	2351992	Area
Result	12.45	12.44	12.47	%
Evaluation	VALID	VALID	VALID	
MEAN ANALYTICAL RESULT				12.45 %

Analyst:	Approved by:
E. Barron	David Connolly

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AGR_009737

High Flow Meter Calibration

Meterbox No.: HF-1
Barometric Pressure: 29.10 (in. Hg)
Calibrated by: BWJ
Date: 4/1/2005

Leak Check: Zero
Leak Check @: 23.5 (in. H2O)

Meter Coefient: ***0.995***
ΔH@: ***1.614***

Point One

Critical Oriface Data

I.D. No.: K'-0.257
Orifice K': 0.2614
Rated cfm: 0.335

Test Results

Time: 15
DGM cfm.: 0.340
Ori. cfm.: 0.335
ΔH@: 1.587
Vm(std): 5.088
Vcr(std): 5.019
Y: 0.986

Metering System Data

	Trial No. 1	2	3	Ave./Total
Ambient Temp.:	57.0	57.0	57.0	57.0
Meter Inlet Temp.:	57.0	58.0	58.0	57.7
Meter Outlet Temp.:	53.0	54.0	54.0	53.7
Meter Temp. Ave.:	55.0	56.0	56.0	55.7
Initial cu. ft.:	453.700	455.390	457.095	
Final cu. ft.:	455.390	457.095	458.807	
Total cu. ft.:	1.690	1.705	1.712	5.107
ΔH w. H2O:	0.32	0.32	0.32	0.320
Vacuum(in.Hg):	20.5	20.5	20.5	20.5
Time:	5.0	5.0	5.0	15.0
ΔH@:	1.607	1.582	1.571	1.587
Vcr(std):	1.673	1.673	1.673	5.019
Vm(std):	1.686	1.698	1.704	5.088
Y:	0.992	0.985	0.982	0.986

Point Two

Critical Oriface Data

I.D. No.: K'-0.385
Orifice K': 0.3979
Rated cfm: 0.510

Test Results

Time: 15
DGM cfm.: 0.511
Ori. cfm.: 0.510
ΔH@: 1.765
Vm(std): 7.675
Vcr(std): 7.647
Y: 0.996

Metering System Data

	Trial No. 1	2	3	Ave./Total
Ambient Temp.:	56.0	56.0	56.0	56.0
Meter Inlet Temp.:	54.0	57.0	57.0	56.0
Meter Outlet Temp.:	51.0	52.0	52.0	51.7
Meter Temp. Ave.:	52.5	54.5	54.5	53.8
Initial cu. ft.:	445.700	448.235	450.810	
Final cu. ft.:	448.235	450.810	453.368	
Total cu. ft.:	2.535	2.575	2.558	7.668
ΔH w. H2O:	0.81	0.81	0.81	0.81
Vacuum(in.Hg):	19.0	19.0	19.0	
Time:	5.0	5.0	5.0	15.0
ΔH@:	1.787	1.742	1.766	1.765
Vcr(std):	2.549	2.549	2.549	7.647
Vm(std):	2.544	2.574	2.557	7.675
Y:	1.002	0.990	0.997	0.996

High Flow Meter Calibration

Meterbox No.: HF-1
Barometric Pressure: 29.1 (in. Hg)
Calibrated by: BWJ
Date: 04/01/05

Leak Check: Zero
Leak Check @: 23.0 (in. H2O)

Meter Coefient: ***0.995***
ΔH@: ***1.614***

Point Three

Critical Oriface Data

I.D. No.: K'-0.559
Orifice K': 0.5693
Rated cfm: 0.730

Test Results

Time: 15
DGM cfm.: 0.733
Ori. cfm.: 0.730
ΔH@: 1.256
Vm(std): 11.070
Vcr(std): 10.954
Y: 0.989

Metering System Data

	Trial No. 1	2	3	Ave./Total
Ambient Temp.:	54.0	55.0	55.0	54.7
Meter Inlet Temp.:	51.0	54.0	55.0	53.3
Meter Outlet Temp.:	49.0	49.0	50.0	49.3
Meter Temp. Ave.:	50.0	51.5	52.5	51.3
Initial cu. ft.:	434.500	438.175	441.840	
Final cu. ft.:	438.175	441.840	445.494	
Total cu. ft.:	3.675	3.665	3.654	10.994
ΔH iv. H2O:	1.20	1.20	1.20	1.20
Vacuum(in.Hg):	17.0	17.0	17.0	17.0
Time:	5.0	5.0	5.0	15.0
ΔH@:	1.240	1.259	1.269	1.256
Vcr(std):	3.654	3.650	3.650	10.954
Vm(std):	3.710	3.689	3.671	11.070
Y:	0.985	0.989	0.994	0.989

Point Four

Critical Oriface Data

I.D. No.: K'-0.821
Orifice K': 0.8424
Rated cfm: 1.077

Test Results

Time: 15
DGM cfm.: 1.066
Ori. cfm.: 1.077
ΔH@: 1.848
Vm(std): 16.041
Vcr(std): 16.155
Y: 1.007

Metering System Data

	Trial No. 1	2	3	Ave./Total
Ambient Temp.:	58.0	58.0	58.0	58.0
Meter Inlet Temp.:	58.0	58.0	58.0	58.0
Meter Outlet Temp.:	55.0	55.0	55.0	55.0
Meter Temp. Ave.:	56.5	56.5	56.5	56.5
Initial cu. ft.:	459.000	464.325	469.660	
Final cu. ft.:	464.325	469.660	474.990	
Total cu. ft.:	5.325	5.335	5.330	15.990
ΔH iv. H2O:	3.70	3.70	3.70	3.70
Vacuum(in.Hg):	13.0	13.0	13.0	13.0
Time:	5.0	5.0	5.0	15.0
ΔH@:	1.851	1.844	1.848	1.848
Vcr(std):	5.385	5.385	5.385	16.155
Vm(std):	5.342	5.352	5.347	16.041
Y:	1.008	1.006	1.007	1.007

High Flow Meter Post Test Calibration

Meterbox No.: HF-1
Company: Agrium CPO/Nu-West Ind.
Source: Phosphate Fertilizer Production Plant
Date: 4/18/2005
Job # AES5041

Leak Check: zero
Leak Check Pressure.: 6.0 (in. H_2O)
Barometric Pressure: 28.65 (in. Hg)
Calibrated by: BWJ
Quarterly Calibration date: 4/1/2005

Pretest Meter Coefient: *0.995*
Pretest ΔH@: *1.614*

Postest Meter Coefient: *0.993*
Postest ΔH@: *2.003*
Pass or Fail *Pass*

Critical Orifice Data

I.D. No.: 0.559
Orifice K': 0.5693
Rated cfm: 0.713

Test Results

Time: 15
DGM cfm.: 0.751
Ori. cfm.: 0.713
ΔH@: 2.003
Vm(std): 10.776
Vcr(std): 10.702
Y: 0.993

Test Point

Metering System Data	Trial No. 1	2	3	Ave./Total
Ambient Temp.:	62.0	63.0	63.0	62.7
Meter Inlet Temp.:	72.0	72.0	73.0	72.3
Meter Outlet Temp.:	69.0	70.0	70.0	69.7
Meter Temp. Ave.:	70.5	71.0	71.5	71.0
Initial cu. ft.:	464.500	468.255	472.020	
Final cu. ft.:	468.255	472.020	475.770	
Total cu. ft.:	3.755	3.765	3.750	11.270
ΔH in. H_2O:	1.800	1.800	1.800	1.800
Vacuum(in.Hg):	18.0	18.0	18.0	18.0
Time:	5.0	5.0	5.0	15.0
ΔH@:	1.998	1.995	2.015	2.003
Vcr(std):	3.569	3.566	3.566	10.702
Vm(std):	3.594	3.600	3.582	10.776
Y:	0.993	0.991	0.995	0.993

PITOT TUBE POST TEST CALIBRATION

Pitot Tube ID No.: AESP12.1
Barometric Pressure: 28.65 (in. Hg)
Calibrated By: BWJ
Date: 4/18/2005

Std. Pitot ID: S-1
Cp(std): 0.99 (in. H20)

Pitot Tube Coefficient (Cp): 0.84

Pitot A-Side Calibration

ΔPstd	ΔPs	Cp (S) a
0.36	0.5	0.84

Pitot B-Side Calibration

ΔPstd	ΔPs	Cp (S) a
0.36	0.5	0.84

THERMOCOUPLE POST TEST CALIBRATION

Thermocouple ID No.: AESP12.1Stack
Calibrated By: BWJ
Date: 4/18/2005

Heat Source: Controlled Electric Furnace
Reference Thermometer: Extech 42312 Dig. Thermometer

Ref. Temp. F°	Equip. Temp. F°	% Diff.
149	150	0.164204

Pitot Tube Calibration

Pitot Tube ID No.: M5.10.2
Barometric Pressure: 28.68 (in. Hg)
Calibrated by: EEO
Date: 4/1/2005

Std. Pitot ID: S-1
Cp(std): 0.99 (in. H2O)

Pitot Tube Coeflent (Cp): ***0.84***

Pitot A-Side Calibration

ΔP_{std}	ΔP_s	$Cp_{(S)}$ [a]	DEV. [b]
0.61	0.85	0.839	0.000
0.61	0.85	0.839	0.000
0.61	0.85	0.839	0.000
	Average:	***0.839***	***0.000***

Pitot B-Side Calibration

ΔP_{std}	ΔP_s	$Cp_{(S)}$ [a]	DEV. [b]
0.61	0.85	0.839	0.000
0.61	0.85	0.839	0.000
0.61	0.85	0.839	0.000
	Average:	***0.839***	***0.000***

$Cp_{(A)} - Cp_{(B)} =$ 0.000 *(must be <0.01)*

Thermocouple Readout Calibration

Calibration Devices
EXTECH 42312 DIGITAL

Reference Thermometer:
EXTECH 42312 DIGITAL
THERMOMETER (NIST)

Date: 4/2/2005
By: EEO

Equipment Thermocouple ID.	Ref. Temp, F°	Equip. Temp, F°	% Diff	Ref. Temp, F°	Equip. Temp, F°	% Diff	Average % Diff
HF-1 Stack	150	148	0.33	500	499	0.10	***0.22***
HF-1 Meter Inlet	50	49	0.20	100	100	0.00	***0.10***
HF-1 Meter Outlet	50	49	0.20	100	100	0.00	***0.10***
HF-1 Dryer Exit	50	49	0.20	100	100	0.00	***0.10***
HF-1 Probe Temp.	250	251	0.14	325	326	0.13	***0.13***
HF-1 Oven/Filter	250	251	0.14	325	326	0.13	***0.13***
HF-2 Stack	150	149	0.16	500	498	0.21	***0.19***
HF-2 Meter Inlet	50	49	0.20	100	99	0.18	***0.19***
HF-2 Meter Outlet	50	49	0.20	100	99	0.18	***0.19***
HF-2 Dryer Exit	50	50	0.00	100	99	0.18	***0.09***
HF-2 Probe Temp.	250	249	0.14	325	324	0.13	***0.13***
HF-2 Oven/Filter	250	249	0.14	325	324	0.13	***0.13***
LF-1 Meter Inlet	60	59	0.19	100	100	0.00	***0.10***
LF-1 Meter Outlet	60	59	0.19	100	100	0.00	***0.10***
LF-1 Probe	250	252	0.28	350	352	0.25	***0.26***
LF-1 Filter	250	252	0.28	350	352	0.25	***0.26***
Hand Held No. 1	250	250	0.00	500	499	0.10	***0.05***
Hand Held No. 2	250	250	0.00	500	500	0.00	***0.00***
Hand Held No. 3	250	250	0.00	500	500	0.00	***0.00***

[(Ref. Temp. Fo +460) - (T/C temp. Fo + 460)] / (Ref. Temp.Fo + 460) *100

Allowable difference ± 1.5%

Thermocouple Sensor Calibration

Heat Source:
Controlled Electric Furnace
Ice Bath

Reference Thermometer:
EXTECH 42312 DIGITAL
THERMOMETER (NIST)

Date: 4/2/2005
By: EEO

Equipment Thermocouple ID.	Ref. Temp, F°	Equip. Temp, F°	% Diff	Ref. Temp, F°	Equip. Temp, F°	% Diff	Average % Diff
AESP4.1 Stack	250	249	0.14	500	496	0.42	***0.28***
AESP4.1 Probe	250	248	0.28	325	327	0.25	***0.27***
AESP6.1 Stack	250	249	0.14	500	497	0.31	***0.23***
AESP6.1 Probe	250	251	0.14	325	327	0.25	***0.20***
AESP8.1 Stack	250	246	0.56	500	499	0.10	***0.33***
AESP8.1 Probe	250	248	0.28	325	324	0.13	***0.20***
AESP10.1 Stack	250	249	0.14	500	499	0.10	***0.12***
AESP10.1 Probe	250	251	0.14	325	323	0.25	***0.20***
AESP12.1 Stack	250	247	0.42	500	498	0.21	***0.32***
AESP12.1 Probe	250	250	0.00	325	325	0.00	***0.00***
AESF3.1	250	248	0.28	500	497	0.31	***0.30***
AESF4.1	250	249	0.14	500	498	0.21	***0.17***
AESF6.1	250	248	0.28	500	498	0.21	***0.25***
AESF8.1	250	249	0.14	500	497	0.31	***0.23***
AESF10.1	250	251	0.14	500	501	0.10	***0.12***
Filter Oven No. 1	250	252	0.28	325	327	0.25	***0.27***
Filter Oven No. 2	250	253	0.42	325	326	0.13	***0.27***
Filter Oven No. 3	250	249	0.14	325	325	0.00	***0.07***
Impinger Exit No. 1	60	59	0.19	32	31	0.20	***0.20***
Impinger Exit No. 2	60	61	0.19	32	32	0.00	***0.10***

[(Ref. Temp. Fo +460) - (T/C temp. Fo + 460)] / (Ref. Temp.Fo + 460) *100

Allowable difference ± 1.5%

NORTHWEST OPACITY CERTIFICATION
CERTIFICATE OF COMPLETION
PLUME EVALUATION TRAINING

BRIAN JOHNSON

EPA REFERENCE METHOD 9 YES

CERTIFICATE NO NW-F04-040

EXPIRATION DATE 4/25/2005

BEARER'S SIGNATURE

PROGRAM COORDINATOR
NORTHWEST OPACITY CERTIFICATION

NORTHWEST OPACITY CERTIFICATION
CERTIFICATE OF COMPLETION
PLUME EVALUATION TRAINING

ERIC E. OLSON

EPA REFERENCE METHOD 9 YES

CERTIFICATE NO WA-S98-16

EXPIRATION DATE 4/25/2005

BEARER'S SIGNATURE

PROGRAM COORDINATOR
NORTHWEST OPACITY CERTIFICATION

Laboratory Data

CHESTER LabNet

12242 SW Garden Place ❖ Tigard, OR 97223-8246 ❖ USA
Telephone 503-624-2183 ❖ Fax 503-624-2653 ❖ www.chesterlab.net

Case Narrative

Date: April 26, 2005

General Information

Client:	Antec Environmental Services
Client Number:	A012
Report Number:	05-095
Sample Description:	Impinger Solutions
Sample Numbers:	05-M247 through 05-M249

Analysis

Analytes:	F
Analytical Protocols:	EPA Method 13b
Analytical Notes:	Per client request, no distillations were performed on the samples. No problems were encountered during the analyses.
QA/QC Review:	All of the data have been reviewed by the analysts performing the analyses and the project manager. All of the quality control and sample-specific information in this package is complete and meets or exceeds the minimum requirements for acceptability.
Comments:	If you have any questions or concerns regarding this analysis, please feel free to contact the project manager.

Paul Duda 4/26/05

Project Manager Date
Paul Duda

Client: A012 - AES
Report Number: 05-095

Lab ID: 05-M247
Client ID: Run 1
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	11,600	50.0	µg/sample

Lab ID: 05-M248
Client ID: Run 2
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	6,430	50.0	µg/sample

Lab ID: 05-M249
Client ID: Run 3
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	19,400	50.0	µg/sample

QA/QC Report

Client Name: AES
Project Number: A012
Analytical Technique: Ion Selective Electrode
Sample Description: Impinger Solution
Report Number: 05-095

Blank Data

Analyte	Sample ID	Measured Conc. mg/L	MDL Conc. mg/L
Fluoride	ICB	< MDL	0.050
Fluoride	CCB	< MDL	0.050

Calibration QC

Analyte	Sample ID	Standard Conc. mg/L	Measured Conc. mg/L	Percent Recovery
Fluoride	ICV	5.00	5.25	105.0
Fluoride	CCV	5.00	5.20	104.0

Duplicate Data

Analyte	Sample ID	Sample Conc. mg/L	Duplicate Conc. mg/L	RPD
Fluoride	05-M248	6.43	6.46	0.47

Laboratory Control Sample/Matrix Spike Analysis

Analyte	Sample ID	Sample Conc. mg/L	Spike Conc. mg/L	Spike Amount mg/L	Percent Recovery
Fluoride	05-M248	6.43	8.85	2.00	121.

QA/QC Limits
Continuing Calibration: ± 10% LCS: ± 20%
Replicates: 20% RPD Spikes: ± 25%
RPD = {(sample-replicate)/[(sample+replicate)/2]}x100
N/C: RPD is not calculated when sample or replicate is below detection limit
#: per EPA CLP protocol, control limits do not apply if sample and/or replicate concentration is less than 5x the detection limit
**: per EPA CLP protocol, control limits do not apply if spike concentration is less than 25% of the sample concentration*

Field Data Sheets

Sample Recovery & Chain of Custody

Client: Agrium
Location: Soda Springs ID
Source: GRANULATOR
Date: 4.15.05
Project No.: AES5041

Antec Environmental Services

	RUN #: Filter #:			RUN #: Filter #:			RUN #: Filter #:		
	Filter tare weight, gms.:			Filter tare weight, gms.:			Filter tare weight, gms.:		
CONTENTS	FINAL	TARE	NET	FINAL	TARE	NET	FINAL	TARE	NET
KO	825.0	456.4	368.6	1495.0	1173.2	321.8	1642.5	1228.5	414.3
H_2O	614.1	609.1	5	560.0	568.7	-8.7	572.5	591.8	2.9
H_2O	573.0	578.2	-5.2	569.1	557.2	11.9	594.7	571.4	1.1
KO	504.2	499.8	4.4	460.3	460.6	-0.3	472.1	472.0	0.1
Silica	736.3	729.3	7.0	771.7	764.1	7.6	779.5	774.6	4.9
Low			-100			-100			-100
	Vlc: (Liquid volume collected, ml)		279.8		Vlc:	232.3		Vlc:	323.3

Sample Description	Sample I.D. Number		
	Run #1 05H247	Run #2 05H248	Run #3 05H249
Front Half Filter	NA	NA	NA
Back Half Filter	IN SAMPLE		x
Probe & Nozzle	Combined with Impinger		
Impinger Catch H_2O	GRAN1405	GRAN2405	GRAN3405
Impinger Rinse	NA	NA	NA
Liquid Levels Marked	yes	yes	yes
Samples Sealed and Stored/Location	TJ refrig lab		
Date & Time Samples Sealed	Post Run	Post Run	Post Run

Date Sampled: 4.15.05
Date & Time Recovered: 4.15.05 Post Run
Recovered by: E. Olson

Released by: [signature] Date: 4.21.05 Received by: [signature] 4.22-05 10:00

Released by: _____ Date: _____ Received by: _____

Released by: _____ Date: _____ Received by: _____

High Flow/Isokinetics Data Sheet

Antec Environmental Services

Method: EPA 13B
Company/Plant: Heritage
Sampling location: Stack
Date: 4/15/05 Project #: AES-011
Operator: BLJ
Meter Box #: HF-1 Meter Box H@: 1.709
Meter Box Calibration(Y): 0.997
Probe #: AES PL.1 c: 0.84

Pitot Tube Leak Check			
Side A	✓	@ 3.5	(in)H2O
Side B	✓	@ 3.7	(in)H2O

Sample Train Leak Check				
Initial	0.000	Outlet@	10.0	(in)Hg
Final	0.000	Outlet@	10.0	(in)Hg

Run #: 1
Barometric Pressure(P_b): 29.50 (in)Hg
Duct Diameter(in): 118 (D_w) (D_s)
Assumed Moisture(%): 26 (T_w) (T_s)
Nozzle Dia$_{ave}$: 0.320 1 0.329 2 0.341 3 0.350
Static Pressure("H_2O): +0.20
Probe & Nozzle Material: Glass

Cyclonic Angle Degrees	min./pt Traverse Pt. Number		Time Sampling Time	Time Clock (24 hr.)	Sample Vacuum (in)Hg	Stack Temp (°F)	Velocity Head ΔPs(in)H_2O	Corrected Head ΔPs(in)H_2O	Pressure Differential ΔH (in) H_2O	Gas sample Volume (Vm) (Cuft)	Dry Gas Meter Temp (°F) Inlet	Dry Gas Meter Temp (°F) Outlet	Sample Probe Temps(°F) Probe	Sample Probe Temps(°F) Filter	Exit Gas Temp(°F)
5	1	12	0	0754	9	147	0.15	0.15	1.5	290.500	36	33	NA	NA	33
5	2	11	3		9	147	0.15	0.15	1.5	292.8	37	33			32
25	3	10	6		9	147	0.28	0.23	2.3	295.0	37	33			33
30	4	9	9		9	147	0.30	0.23	2.3	297.8	38	34			33
35	5	8	12		8	147	0.25	0.17	1.7	300.6	39	35			38
30	6	7	15		8	146	0.21	0.16	1.6	303.0	40	35			41
70	7	6	18		1	146	0.03	0.01	0.10	305.3	41	35			42
75	8	5	21		1	145	0.06	0.01	0.10	305.9	41	36			42
70	9	4	24		1	146	0.10	0.01	0.10	306.5	41	36			41
65	10	3	27		2	145	0.17	0.03	0.30	307.1	42	36			41
60	11	2	30		3	145	0.23	0.06	0.61	308.1	44	37			41
60	12	1	33		3	145	0.23	0.06	0.61	309.6	44	37			41
20	13	12	36		9	146	0.29	0.26	2.7	311.0	49	39			41
20	14	11	39		9	146	0.29	0.26	2.7	314.0	49	39			41
25	15	10	42		9	147	0.25	0.21	2.1	317.1	50	40			42
35	16	9	45		8	147	0.25	0.17	1.7	319.8	50	41			43
35	17	8	48		6	147	0.20	0.13	1.3	322.2	50	41			44
45	18	7	51		4	145	0.14	0.07	0.72	324.4	51	42			45
70	19	6	54		1	146	0.02	0.01	0.10	325.9	50	42			45
70	20	5	57		1	146	0.05	0.01	0.10	326.5	48	43			46
75	21	4	60		1	147	0.07	0.01	0.10	327.1	48	43			44
70	22	3	63		1	146	0.12	0.01	0.10	327.7	47	43			41
65	23	2	66		1	146	0.13	0.02	0.21	328.3	48	43			41
65	24	1	69		2	146	0.13	0.02	0.21	329.2	48	43			41
	END		72	0913	—	—	—	—	—	330.010	—	—	—	—	
	Average					146.2		0.078	1.035	39.510		41.4			

DSCFM - 45810

High Flow/Isokinetics Data Sheet

Antec Environmental Services

Method: EPA 13B
Company/Plant: AGRIUM
Sampling location: Granulator
Date: 4-15-05 Project #: AES5041
Operator: BWT
Meter Box #: HF-1 Meter Box H@: 1.709
Meter Box Calibration(Y): 0.997
Probe #: AESPR-1 C_p: 0.84

Pitot Tube Leak Check			
Side A:	Ø	@ 3.7	(in)H_2O
Side B:	Ø	@ 3.9	(in)H_2O

Sample Train Leak Check			
Initial:	0.002	Cuft@ 10.0	(in)Hg
Final:	0.002	Cuft@ 10.0	(in)Hg

Run #: 2
Barometric Pressure(P_b): 24.5 (in)Hg
Duct Diameter(in): 118 (D_s) (D_s)
Assumed Moisture(%): 0.26 (T_w): (T_d):
Nozzle Dia$_{ave}$: 0.380 1 2 3
Static Pressure("H_2O): + 0.20
Probe & Nozzle Material: Glass

Cyclonic Angle Degrees	min./pt Traverse Pt. Number		Time Sampling Time	Time Clock (24 hr.)	Sample Vacuum (in)Hg.	Stack Temp (°F)	Velocity Head ΔPs(in)H_2O	Corrected Head ΔPs(in)H_2O	Pressure Differential ΔH (in) H_2O	Gas sample Volume (Vm) (Cuft)	Dry Gas Meter Temp (°F) Inlet	Dry Gas Meter Temp (°F) Outlet	Sample Probe Temps(°F) Probe	Sample Probe Temps(°F) Filter	Exit Gas Temp(°F)
10	1	12	0	~~8754~~	9	145	0.27	0.26	2.7	332.000	47	46	NA	NA	38
10	2	11	3	1018	9	146	0.27	0.26	2.7	335.0	47	46			37
15	3	10	6		8	146	0.25	0.23	2.4	338.1	47	46			36
25	4	9	9		6	146	0.24	0.20	2.1	340.9	48	46			37
30	5	8	12		6	146	0.22	0.17	1.8	343.6	49	46			40
45	6	7	15		3	145	0.15	0.08	0.83	346.1	50	46			41
~~80~~	7	6	18		1	145	0.02	0.01	0.10	347.8	51	46			42
70	8	5	21		1	146	0.04	0.01	0.10	348.8	50	46			43
80	9	4	24		1	147	0.05	0.01	0.10	349.0	49	46			44
75	10	3	27		1	147	0.09	0.01	0.10	349.6	49	46			43
60	11	2	30		2	147	0.14	0.04	0.41	350.2	49	46			41
60	12	1	33		2	146	0.14	0.04	0.41	351.3	49	46			41
10	13	12	36		9	147	0.25	0.24	2.5	352.5	51	46			41
10	14	11	39		9	147	0.25	0.24	2.5	355.5	51	46			41
15	15	10	42		7	147	0.20	0.19	2.0	358.4	54	47			42
20	16	9	45		6	147	0.18	0.16	1.7	361.0	55	47			42
30	17	8	48		7	147	0.25	0.19	2.0	363.4	54	47			44
45	18	7	51		4	147	0.15	0.08	0.83	366.0	55	47			45
70	19	6	54		1	146	0.04	0.01	0.10	367.7	54	47			46
75	20	5	57		1	146	0.05	0.01	0.10	368.3	52	47			46
75	21	4	60		1	146	0.07	0.01	0.10	368.9	52	47			46
70	22	3	63		1	147	0.18	0.02	0.21	369.5	52	47			44
55	23	2	66		4	147	0.27	0.09	0.93	370.4	52	47			43
55	24	1	69		4	147	0.27	0.09	0.93	372.2	52	47			43
	END		72	1131	—	—	—	—	—	373.975	—	—	—	—	—
	Average					146.4		0.085	1.138	41.975		48.6			

DSCFM - 47919

High Flow/Isokinetics Data Sheet

Antec Environmental Services

Method: EPA 13 B
Company/Plant: Asbury
Sampling location: Accumulator
Date: 4-15-05 Project #: AES5041
Operator: BWJ
Meter Box #: HF-1 Meter Box H@: 1.709
Meter Box Calibration(Y): 0.997
Probe #: AESPR-1 Cp: 0.84

Pitot Tube Leak Check			
Side A.	✓	@ 3.7	(in)H_2O
Side B:	✓	@ 3.9	(in)H_2O

Sample Train Leak Check			
Initial: 0.000	Cuft@	10.0	(in)Hg
Final: 0.000	Cuft@	10.0	(in)Hg

Run #: 3
Barometric Pressure(P_b): 24.5 (in)Hg
Duct Diameter(in): 118 (D_s) (D_n)
Assumed Moisture(%): 26 (T_s): (T_d):
Nozzle Dia$_{ave}$: 0.370 1 2 3
Static Pressure("H_2O): -0.20
Probe & Nozzle Material: Glass

Cyclonic Angle Degrees	min./pt Traverse Pt. Number		Time Sampling Time	Time Clock (24 hr.)	Sample Vacuum (in)Hg.	Stack Temp (°F)	Velocity Head ΔPs(in)H_2O	Corrected Head ΔPs(in)H_2O	Pressure Differential ΔH (in) H_2O	Gas sample Volume (Vm) (Cuft)	Dry Gas Meter Temp (°F) Inlet	Dry Gas Meter Temp (°F) Outlet	Sample Probe Temps(°F) Probe	Sample Probe Temps(°F) Filter	Exit Gas Temp(°F)
10	1	12	0	1220	7	146	0.30	0.29	3.0	375.600	46	44	NA	NA	38
10	2	11	3		7	146	0.30	0.29	3.0	378.8	46	44			38
25	3	10	6		6	147	0.25	0.21	2.1	382.0	47	44			39
30	4	9	9		5	147	0.22	0.17	1.7	384.7	48	44			40
35	5	8	12		5	147	0.26	0.17	1.7	387.2	49	44			41
45	6	7	15		4	146	0.22	0.11	1.1	389.6	51	45			42
70	7	6	18		1	146	0.04	0.01	0.10	391.6	51	45			44
70	8	5	21		1	147	0.07	0.01	0.10	392.2	50	46			44
75	9	4	24		1	146	0.12	0.01	0.10	392.8	50	46			44
70	10	3	27		1	146	0.16	0.02	0.21	393.4	50	46			44
60	11	2	30		3	146	0.25	0.06	0.62	394.3	51	46			43
60	12	1	33		3	146	0.25	0.06	0.62	395.7	51	46			43
15	13	12	36		8	146	0.24	0.22	2.3	397.2	52	47			43
15	14	11	39		8	146	0.24	0.22	2.3	400.0	52	47			43
15	15	10	42		8	147	0.18	0.17	1.8	402.8	54	47			44
30	16	9	45		8	147	0.24	0.18	1.9	405.3	55	47			45
35	17	8	48		6	146	0.18	0.12	1.2	407.8	55	48			45
45	18	7	51		4	146	0.15	0.08	0.83	409.9	55	48			46
70	19	6	54		1	146	0.02	0.01	0.10	411.6	55	49			46
70	20	5	57		1	147	0.03	0.01	0.10	412.2	53	49			46
75	21	4	60		1	147	0.07	0.01	0.10	412.8	52	49			45
70	22	3	63		1	147	0.10	0.01	0.10	413.4	52	49			45
55	23	2	66		4	147	0.20	0.07	0.72	414.0	52	49			45
55	24	1	69		4	147	0.20	0.07	0.72	415.6	52	49			45
	END		72	1344	—	—	—	—	—	417.199	—	—	—	—	—
	Average					146.5		0.034	1.107	41.599		48.9			

DSCFM - 47495

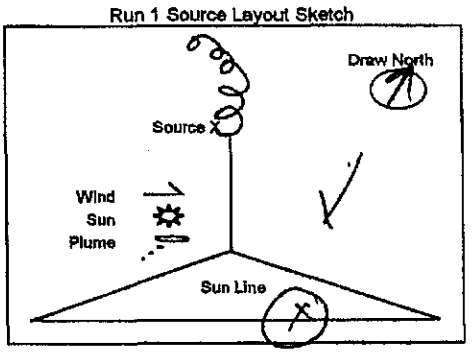
EPA Method 9 Opacity

Client: Agrium
Location: Socle Springs
Site: Granulator
Date: 4-15-05

Process Equipment: Granulator
Control Equipment: Scrubber Wet
Facility Type:
Observed by: [illegible]

Observation Conditions	Run 1	Run 2	Run 3
Sky Condition:	Clear	Clear	Clear
Background/Color:	Blue	Blue	Blue
Wind Speed:	0-5	0-5	0-5
Wind Direction:	S	S	S
Ambient Temp:	40	40	46
Relative Humidity:	42	44	44
Height of Discharge Point:	110 ft	110 ft	100 ft
Height of Observation Point:	ground	ground	ground
Distance & Direction from Plume:	≈ 1000 yds	≈ 1000 yds	≈ 1000 yds
Plume Color:	WHITE	WHITE	WHITE
Plume Type(attached/detached):	Attached	Attached	Attached
Viewing Angle:	∠20	∠20	∠20

Run 1 Source Layout Sketch



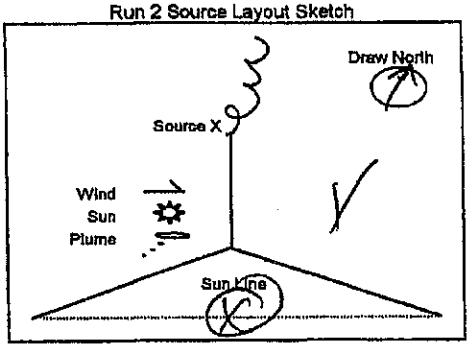
After 1st 13b Run

Run 1

Start	945	Stop	1045
0	15	30	45
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Readings Ranged from 0 to 0 % Opacity

Run 2 Source Layout Sketch



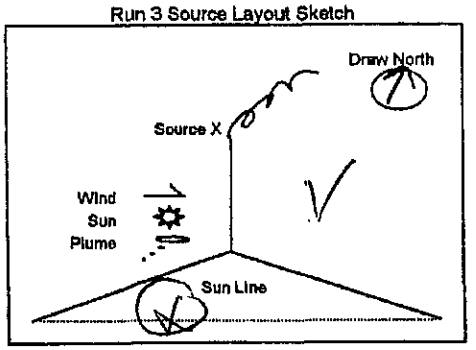
After 2nd 13b Run

Run 2

Start	1137	Stop	1147
0	15	30	45
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Readings Ranged from 0 to 0 % Opacity

Run 3 Source Layout Sketch



After 3rd 13b Run

Run 3

Start	1356	Stop	1406
0	15	30	45
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Readings Ranged from 0 to 0 % Opacity

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Michael Stambules
DEQ
1410 N. Hilton
Boise, ID 83706

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X RECEIVED ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) C. Date of Delivery

MAY 12 2005

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

CENTRAL POSTAL SERVICES

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (*Extra Fee*) ☐ Yes

2. Article Number
(*Transfer from service label*) 7001 0320 0003 0613 6815

PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-1540

AGR_009754

Agrium

Agrium Conda Phosphate Operations*
3010 Conda Road
Soda Springs, ID 83276
Tel: 208-547-4381
Fax: 208-547-2550

May 13, 2005

File No.: EN-04-064

FedEx Tracking # 792922272195

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of our annual compliance report for a source test conducted at our facility April 15, 2005 by Antec Environmental Services. Attached to the report is Supplements 1, which contains an emission summary and monitored data.

In accordance with IDAPA 58.01.01.123, and "based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

Sincerely,

for

Charles H. Ross
General Manager

CHR:mj
Enc. (2) copies of test report + (2) copies of Supplements 1

* A Registered Name of Nu-West Industries, Inc.

Agrium Conda Phosphate Operations*
3010 Conda Road
Soda Springs, ID 83276
Tel: 208-547-4381
Fax: 208-547-2550

May 13, 2005

File No.: EN-04-064

FedEx Tracking # 792922272195

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of reports for annual source testing conducted at our facility April 15, 2005 by Antec Environmental Services, a Northbend, Washington testing company. The stack test was conducted at worst-case normal conditions, as described at IDAPA 58.01.01.157.02.a. The report includes test data for the following source at our Conda facility, listed with applicable Tier I Operating Permit 029-00003 sections limiting emissions:

Phosphate Fertilizer Production Process ("Granulation Plant") - Section 2.10

In addition to the reports produced by Antec, I have included operational monitored data and calculations demonstrating compliance/non-compliance for each test. This information is included with this letter as Supplement 1 to Antec's report. A summary of data and emission calculations appear below:

Phosphate Fertilizer Production Process ("Granulation Plant") - Section 2.10

Test date: April 15, 2005

Permitted fluoride emissions:	0.058 lb/Ton P_2O_5 feed
Fluoride emissions during test:	0.049 lb/Ton P_2O_5 feed [In compliance]
P_2O_5 feed to process during test:	44.36 tons/hr
Pressure drop across granulator scrubber:	18.6 inches H_2O
Pressure drop across dryer scrubber:	16.6 inches H_2O
Granulator scrubber flow rate:	375 gpm
Dryer scrubber flow rate:	725 gpm

* A Registered Name of Nu-West Industries, Inc.

As indicated by the sampling data provided by Antec and the summary above, the source test and calculations demonstrated compliance to permit limitations.

Opacity readings were performed during the test and observations are included.

It is our pleasure and opportunity to provide you with this source test information. We appreciate DEQ's assistance in helping us maintain compliance with state and federal air quality regulations.

If you have any questions concerning this letter or the enclosed Compliance Report by Antec, please call me at (208) 547-4381 extension 263.

Sincerely,

Monty Johnson
Environmental Manager

Attachments: Supplement 1 to Antec Report
Enclosures: two (2) copies of Antec report for April 15, 2005

Nu-west Industries, Inc.
d.b.a. Agrium Conda Phosphate Operations
3010 Conda Road
Soda Springs, Idaho 83276

Fluoride Emission Calculation (40 CFR 63.606(c)(1):

$$E = \left(\sum_{i=1}^{N} C_{si} Q_{sdi} \right) / (PK)$$

Where:
E = emission rate of total fluorides, (lb/ton) of equivalent P_2O_5 feed
C_{si} = concentration of total fluorides from emission point "i", (mg/dscf)
Q_{sdi} = volumetric flow rate of effluent gas from emission point "i", (dscf/hr)
N = number of emission points associated with the affected facility.
P = equivalent P_2O_5 feed rate, (ton/hr)
K = conversion factor, (453,600 mg/lb)

Run #1 **Granulation 04/15/05**

Csi =	11.6 mg F/	33.991 DSCF		
Qsdi =	44776 DSCFM	2686560 DSCFH		
N =	1			
P =	242 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.30 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.045623 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**78.7**

Run #2 **Granulation 04/15/05**

Csi =	6.43 mg F/	35.661 DSCF		
Qsdi =	48239 DSCFM	2894340 DSCFH		
N =	1			
P =	243 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.49 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.025863 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**44.6**

Run #3 **Granulation 04/15/05**

Csi =	19.4 mg F/	35.268 DSCF		
Qsdi =	46305 DSCFM	2778300 DSCFH		
N =	1			
P =	242 gpm	1.59 SPG	0.2503 gpm-tph	
	46 % P2O5		P=	44.30 tons P2O5/hr
K = conversion factor		453600 mg/lb		
E =	0.076049 lbs F/ton P2O5	Emission limit =		0.058 lbs F/ton P2O5
		% of Standard =		**131.1**
		% of Std. Ave. =		**84.8**

Prepared by: Monty Johnson

Granulator EPA 1-4

		Run #1	Run #2	Run #3	
Client:	Agrium				
Location:	Soda Springs, ID				
Source:	Granulator				
Date:	April 15, 2005	4/15/2005	4/15/2005	4/15/2005	
Project No.:	AES5041	754	1018	1220	
		913	1131	1334	**Averages**
Q:	Total sample time[1]:	72	72	72	**72**
Vm:	(Volume,dry gas meter,cf)	39.510	41.975	41.599	**41.028**
Y:	(Dry gas meter calibration factor)	0.995	0.995	0.995	**0.995**
Pbar:	(Barometric pressure,in.Hg)	24.50	24.50	24.50	**24.50**
ΔH:	(Avg. differential pressure,in.H2O)	1.04	1.14	1.11	**1.10**
Tm:	(Avg. meter temperature,°F)	41.4	48.6	48.9	**46.3**
Vm(std.):	(Std.* sample gas volume, DSCF)	33.991	35.611	35.268	**34.957**
Vlc:	(Liquid volume collected,ml)	279.8	232.3	323.3	**278.5**
Vw(std):	(Std.* water vapor volume,scf)	13.170	10.934	15.218	**13.107**
SVP:	(Saturated H_2O vapor pressure, in. Hg	6.92	6.95	6.97	**6.945**
Bwsat:	(Saturated Moisture @ Ts)	0.282	0.283	0.284	**0.283**
Bwsvol	(Volumemetric Moisture content)	0.279	0.235	0.301	**0.272**
Bws:	(SCF H_2O / SCF Total)[2]	0.279	0.235	0.284	**0.266**
%CO_2:	(Carbon Dioxide,% by volume,dry)	0.53	0.54	0.52	**0.53**
%O_2:	(Oxygen,% by volume,dry)	20.12	20.09	19.99	**20.07**
%N_2:	(Nitrogen,% by volume,dry)	79.35	79.37	79.49	**79.40**
Md:	(Molecular Weight,lb/lb-mole,dry)	28.89	28.89	28.88	**28.89**
Mw:	(Molecular Weight,lb/lb-mole,wet)	25.85	26.33	25.79	**25.99**
D:	(Duct diameter, in.)	118.00	118.00	118.00	**118.00**
A:	(Duct area, sq. ft.)	75.95	75.95	75.95	**75.95**
Ts:	(Stack temperature, °F)	146.2	146.4	146.5	**146.4**
Dn:	(Nozzle diameter, in.)	0.380	0.380	0.380	***0.380***
An:	(Nozzle area, ft2)	7.88E-04	7.88E-04	7.88E-04	***7.88E-04***
Pg:	(Static pressure of flue gas, in. H_2O)	0.2	0.2	0.2	**0.20**
Ps:	(Absolute stack gas pressure, in. Hg)	24.51	24.51	24.51	**24.51**
Cp:	(Pitot tube coefficient)	0.84	0.84	0.84	**0.84**
ΔP:	(Average velocity head, in. H_2O)	0.0740	0.078	0.080	**0.077**
Vs:	(Gas velocity, ft./second)	19.1	19.4	19.9	**19.5**
ACFM:	(Actual cubic feet/min., wet)	87039	88406	90684	**88710**
SCFM	(Std. cubic ft/min., wet)	62149	63104	64720	**63324**
SDCFM:	(Std.* cubic feet/min., dry)	44776	48239	46305	**46440**
% Iso:	(Isokinetic variation)	101.7	98.9	102.1	***100.9***

Generic Any Materials
Default Subreport 1

			GRAVIMETRIC P2O5	SP.G. OP	TJA ACID+PROJ		
			Grav P2O5	Specific Gravity	Averaged P2O5	P2O5	P2O5v
			wt.%	none	wt.%	wt.%	wt.%
Sample Date/Time	User Sample ID	Sample ID	(AVG)	(AVG)	(AVG)	(AVG)	(AVG)
4/14/2005 23:50	PHOSFEED	200108269		1.59	46	46.5	45.4

15min		04FIC041/PID1/PV.CV 42% ACID TO PRENEUT TANK GPM		24FIC009101/PID1/PV.CV GRANULATOR TRIM ACID GPM		
4/15/2005	15-Apr-05 00:00:00	179.88		9.69		
4/16/2005	15-Apr-05 00:15:00	179.57		9.90		
	15-Apr-05 00:30:00	179.83		9.87		
	15-Apr-05 00:45:00	179.56		9.63		
	15-Apr-05 01:00:00	179.42		9.39		
	15-Apr-05 01:15:00	179.15		9.31		
	15-Apr-05 01:30:00	180.18		9.72		
	15-Apr-05 01:45:00	180.64		9.81		
	15-Apr-05 02:00:00	180.90		9.81		
	15-Apr-05 02:15:00	180.85		9.80		
	15-Apr-05 02:30:00	180.06		9.79		
	15-Apr-05 02:45:00	179.61		9.79		
	15-Apr-05 03:00:00	179.23		9.78		
	15-Apr-05 03:15:00	164.08		10.34		
	15-Apr-05 03:30:00	60.72		6.20		
	15-Apr-05 03:45:00	60.01		0.03		
	15-Apr-05 04:00:00	59.89		-0.01		
	15-Apr-05 04:15:00	59.77		-0.06		
	15-Apr-05 04:30:00	59.64		-0.10		
	15-Apr-05 04:45:00	59.52		-0.15		
	15-Apr-05 05:00:00	59.40		-0.20		
	15-Apr-05 05:15:00	59.28		-0.24		
	15-Apr-05 05:30:00	106.42		-0.29		
	15-Apr-05 05:45:00	114.36		-0.33		
	15-Apr-05 06:00:00	82.52		5.64		
	15-Apr-05 06:15:00	153.21		11.34		
	15-Apr-05 06:30:00	200.69		12.29		
	15-Apr-05 06:45:00	220.50		12.53		
	15-Apr-05 07:00:00	221.26		12.83		
	15-Apr-05 07:15:00	226.62		12.47		
	15-Apr-05 07:30:00	228.75		12.45		
	15-Apr-05 07:45:00	229.39		12.46		
	15-Apr-05 08:00:00	229.39		12.64		
	15-Apr-05 08:15:00	229.77		12.27		
	15-Apr-05 08:30:00	230.25		11.89		
	15-Apr-05 08:45:00	230.73		11.73		
	15-Apr-05 09:00:00	230.19		11.81		
	15-Apr-05 09:15:00	229.18	230	11.90	12	242
	15-Apr-05 09:30:00	229.55		12.14		
	15-Apr-05 09:45:00	230.28		12.48		
	15-Apr-05 10:00:00	230.41		12.56		
	15-Apr-05 10:15:00	230.56		12.51		
	15-Apr-05 10:30:00	230.66		12.47		
	15-Apr-05 10:45:00	230.55		12.42		
	15-Apr-05 11:00:00	230.45		12.37		
	15-Apr-05 11:15:00	230.49		12.32		

15-Apr-05 11:30:00	230.44	231	12.27	12	243
15-Apr-05 11:45:00	229.71		12.23		
15-Apr-05 12:00:00	229.77		12.18		
15-Apr-05 12:15:00	229.84		12.13		
15-Apr-05 12:30:00	229.92		12.08		
15-Apr-05 12:45:00	230.00		12.03		
15-Apr-05 13:00:00	230.07		11.98		
15-Apr-05 13:15:00	230.15		11.94		
15-Apr-05 13:30:00	230.22	230	11.91	12	242
15-Apr-05 13:45:00	230.30		11.96		
15-Apr-05 14:00:00	230.38		12.01		

Granulation Plant Granulator Scrubber Flow and Pressure Drop

15min	04FIC022105/PID1/PV.CV GRAN SCRUBBER ACID gpm		24PDI093105/AI1/PV.CV GRAN/AMMONIA SCRUBBER D/P in. H2O	
4/15/2005				
4/16/2005				
15-Apr-05 00:00:00	375.02		17.71	
15-Apr-05 00:15:00	374.99		18.16	
15-Apr-05 00:30:00	374.97		17.82	
15-Apr-05 00:45:00	374.94		17.80	
15-Apr-05 01:00:00	374.91		17.95	
15-Apr-05 01:15:00	374.95		18.18	
15-Apr-05 01:30:00	375.03		17.59	
15-Apr-05 01:45:00	375.10		17.39	
15-Apr-05 02:00:00	375.18		17.45	
15-Apr-05 02:15:00	375.26		17.60	
15-Apr-05 02:30:00	375.34		17.70	
15-Apr-05 02:45:00	375.42		17.53	
15-Apr-05 03:00:00	375.49		17.42	
15-Apr-05 03:15:00	375.57		16.92	
15-Apr-05 03:30:00	375.65		11.95	
15-Apr-05 03:45:00	375.73		8.15	
15-Apr-05 04:00:00	375.81		7.81	
15-Apr-05 04:15:00	375.88		7.35	
15-Apr-05 04:30:00	375.96		7.13	
15-Apr-05 04:45:00	376.04		7.05	
15-Apr-05 05:00:00	376.12		7.11	
15-Apr-05 05:15:00	376.09		7.79	
15-Apr-05 05:30:00	376.00		9.99	
15-Apr-05 05:45:00	375.91		11.15	
15-Apr-05 06:00:00	375.82		14.56	
15-Apr-05 06:15:00	375.73		18.90	
15-Apr-05 06:30:00	375.64		19.60	
15-Apr-05 06:45:00	375.56		19.55	
15-Apr-05 07:00:00	375.62		19.53	
15-Apr-05 07:15:00	375.72		19.39	
15-Apr-05 07:30:00	375.81		19.60	
15-Apr-05 07:45:00	375.91		19.70	
15-Apr-05 08:00:00	376.00		19.57	
15-Apr-05 08:15:00	376.10		19.05	
15-Apr-05 08:30:00	376.19		18.83	
15-Apr-05 08:45:00	376.29		19.31	
15-Apr-05 09:00:00	376.37		19.47	
15-Apr-05 09:15:00	376.28	376	19.36	19.26
15-Apr-05 09:30:00	376.10		19.46	
15-Apr-05 09:45:00	375.94		19.12	
15-Apr-05 10:00:00	375.79		19.13	

15-Apr-05 10:15:00	375.64		17.55	
15-Apr-05 10:30:00	375.49		18.39	
15-Apr-05 10:45:00	375.33		17.61	
15-Apr-05 11:00:00	375.18		17.80	
15-Apr-05 11:15:00	375.03		18.37	
15-Apr-05 11:30:00	374.88	375	17.40	17.85
15-Apr-05 11:45:00	374.73		18.16	
15-Apr-05 12:00:00	374.58		18.54	
15-Apr-05 12:15:00	374.43		18.41	
15-Apr-05 12:30:00	374.28		18.67	
15-Apr-05 12:45:00	374.13		19.00	
15-Apr-05 13:00:00	373.98		18.21	
15-Apr-05 13:15:00	373.82		18.83	
15-Apr-05 13:30:00	373.67	374	18.74	18.64
15-Apr-05 13:45:00	373.66		18.68	
15-Apr-05 14:00:00	373.78	Average =	18.67	Average =
15-Apr-05 14:15:00	373.89	375	19.11	18.59
15-Apr-05 14:30:00	374.01		19.47	
15-Apr-05 14:45:00	374.12		19.93	
15-Apr-05 15:00:00	374.23		19.85	
15-Apr-05 15:15:00	374.35		18.65	
15-Apr-05 15:30:00	374.46		18.57	
15-Apr-05 15:45:00	374.53		18.89	
15-Apr-05 16:00:00	374.57		17.20	
15-Apr-05 16:15:00	374.61		17.65	
15-Apr-05 16:30:00	374.65		17.56	
15-Apr-05 16:45:00	374.68		18.82	
15-Apr-05 17:00:00	374.72		19.21	
15-Apr-05 17:15:00	374.76		19.59	
15-Apr-05 17:30:00	374.80		20.17	
15-Apr-05 17:45:00	374.84		19.47	
15-Apr-05 18:00:00	374.87		18.41	
15-Apr-05 18:15:00	374.91		18.60	
15-Apr-05 18:30:00	374.95		15.50	
15-Apr-05 18:45:00	374.99		12.19	
15-Apr-05 19:00:00	375.02		11.41	
15-Apr-05 19:15:00	375.06		11.46	
15-Apr-05 19:30:00	375.10		10.10	
15-Apr-05 19:45:00	375.15		9.35	
15-Apr-05 20:00:00	375.20		9.19	
15-Apr-05 20:15:00	375.25		8.73	
15-Apr-05 20:30:00	375.31		8.50	
15-Apr-05 20:45:00	375.36		8.34	
15-Apr-05 21:00:00	375.42		8.19	
15-Apr-05 21:15:00	375.47		8.58	
15-Apr-05 21:30:00	375.53		9.02	
15-Apr-05 21:45:00	375.58		9.36	
15-Apr-05 22:00:00	375.63		9.76	
15-Apr-05 22:15:00	375.69		10.25	
15-Apr-05 22:30:00	375.74		11.38	
15-Apr-05 22:45:00	375.80		11.91	
15-Apr-05 23:00:00	375.85		11.88	

15-Apr-05 23:15:00	375.91	11.85
15-Apr-05 23:30:00	375.96	12.21
15-Apr-05 23:45:00	375.81	11.88

Granulation Plant Dryer Scrubber Flow and Pressure Drop

15min		04FIC014105/PID1/PV.CV DRYER SCRUBBER FLOW gpm		24PDI094105/AI1/PV.CV DRYER SCRUBBER D/P in. H2O	
4/15/2005					
4/16/2005					
	15-Apr-05 00:00:00	727.09		18.33	
	15-Apr-05 00:15:00	726.41		18.14	
	15-Apr-05 00:30:00	725.73		18.25	
	15-Apr-05 00:45:00	725.06		18.46	
	15-Apr-05 01:00:00	724.88		18.45	
	15-Apr-05 01:15:00	724.66		18.46	
	15-Apr-05 01:30:00	724.41		18.28	
	15-Apr-05 01:45:00	724.16		18.45	
	15-Apr-05 02:00:00	723.91		18.16	
	15-Apr-05 02:15:00	723.66		18.37	
	15-Apr-05 02:30:00	723.40		19.00	
	15-Apr-05 02:45:00	723.15		18.47	
	15-Apr-05 03:00:00	722.90		18.26	
	15-Apr-05 03:15:00	722.65		18.37	
	15-Apr-05 03:30:00	722.40		18.26	
	15-Apr-05 03:45:00	722.15		17.81	
	15-Apr-05 04:00:00	721.90		17.50	
	15-Apr-05 04:15:00	723.46		17.30	
	15-Apr-05 04:30:00	725.97		17.71	
	15-Apr-05 04:45:00	726.00		17.09	
	15-Apr-05 05:00:00	726.03		16.11	
	15-Apr-05 05:15:00	726.06		16.62	
	15-Apr-05 05:30:00	726.09		17.44	
	15-Apr-05 05:45:00	726.12		17.52	
	15-Apr-05 06:00:00	726.14		16.97	
	15-Apr-05 06:15:00	726.17		17.54	
	15-Apr-05 06:30:00	726.20		18.04	
	15-Apr-05 06:45:00	726.23		18.01	
	15-Apr-05 07:00:00	726.26		18.08	
	15-Apr-05 07:15:00	726.29		18.01	
	15-Apr-05 07:30:00	726.32		17.94	
	15-Apr-05 07:45:00	726.35		16.21	
	15-Apr-05 08:00:00	726.38		16.31	
	15-Apr-05 08:15:00	726.39		17.49	
	15-Apr-05 08:30:00	726.13		17.30	
	15-Apr-05 08:45:00	725.80		16.26	
	15-Apr-05 09:00:00	725.48		16.24	
	15-Apr-05 09:15:00	725.15	726	16.63	16.70
	15-Apr-05 09:30:00	724.83		16.74	
	15-Apr-05 09:45:00	724.50		16.77	
	15-Apr-05 10:00:00	724.17		15.75	

15-Apr-05 10:15:00	723.85		16.90	
15-Apr-05 10:30:00	723.52		16.42	
15-Apr-05 10:45:00	723.19		16.61	
15-Apr-05 11:00:00	723.15		16.26	
15-Apr-05 11:15:00	724.87		16.71	
15-Apr-05 11:30:00	725.44	724	18.17	16.84
15-Apr-05 11:45:00	725.44		16.22	
15-Apr-05 12:00:00	725.43		16.05	
15-Apr-05 12:15:00	725.43		15.84	
15-Apr-05 12:30:00	725.43		16.45	
15-Apr-05 12:45:00	725.43		16.63	
15-Apr-05 13:00:00	725.43		16.07	
15-Apr-05 13:15:00	725.43		15.55	
15-Apr-05 13:30:00	725.42	725	16.59	16.19
15-Apr-05 13:45:00	725.42		17.08	
15-Apr-05 14:00:00	725.42	Average =	16.09	Average =
15-Apr-05 14:15:00	725.42	725	16.11	16.58
15-Apr-05 14:30:00	725.42		16.12	
15-Apr-05 14:45:00	725.42		17.60	
15-Apr-05 15:00:00	725.42		16.59	
15-Apr-05 15:15:00	725.41		16.66	
15-Apr-05 15:30:00	725.42		17.16	
15-Apr-05 15:45:00	725.43		17.78	
15-Apr-05 16:00:00	725.44		18.67	
15-Apr-05 16:15:00	725.45		17.88	
15-Apr-05 16:30:00	725.46		18.11	
15-Apr-05 16:45:00	725.46		18.70	
15-Apr-05 17:00:00	725.47		18.88	
15-Apr-05 17:15:00	725.48		18.81	
15-Apr-05 17:30:00	725.49		18.90	
15-Apr-05 17:45:00	725.50		18.86	
15-Apr-05 18:00:00	725.51		18.83	
15-Apr-05 18:15:00	725.52		18.86	
15-Apr-05 18:30:00	725.52		19.11	
15-Apr-05 18:45:00	725.53		16.50	
15-Apr-05 19:00:00	725.54		15.62	
15-Apr-05 19:15:00	725.51		15.00	
15-Apr-05 19:30:00	725.05		14.44	
15-Apr-05 19:45:00	724.87		14.55	
15-Apr-05 20:00:00	726.23		13.86	
15-Apr-05 20:15:00	726.22		13.95	
15-Apr-05 20:30:00	726.20		13.86	
15-Apr-05 20:45:00	726.19		14.17	
15-Apr-05 21:00:00	726.17		14.32	
15-Apr-05 21:15:00	726.16		13.33	
15-Apr-05 21:30:00	726.14		12.94	
15-Apr-05 21:45:00	726.13		12.75	
15-Apr-05 22:00:00	726.11		9.13	
15-Apr-05 22:15:00	726.10		8.26	
15-Apr-05 22:30:00	726.08		8.18	
15-Apr-05 22:45:00	726.07		8.32	
15-Apr-05 23:00:00	726.05		8.39	

15-Apr-05 23:15:00	726.04	8.02
15-Apr-05 23:30:00	726.02	7.40
15-Apr-05 23:45:00	726.00	7.95

Client: A012 - AES
Report Number: 05-095

Lab ID: 05-M247
Client ID: Run 1
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	11,600	50.0	µg/sample

Lab ID: 05-M248
Client ID: Run 2
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	6,430	50.0	µg/sample

Lab ID: 05-M249
Client ID: Run 3
Site: Agrium

Analyte	Result	MDL	Units
Fluoride, ISE	19,400	50.0	µg/sample

Floudl comp lists
Phos acid plant
stack

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No. 2-153L
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HASTINGS, MN

MINIMUM RECYCLED CONTENT

AGR_009770

Agrium

Agrium Conda Phosphate Operations*
3010 Conda Road
Soda Springs, ID 83276
Tel: 208-547-4381
Fax: 208-547-2550

April 26, 2005

File No.: EN-04-055

CERTIFIED MAIL #7001 0320 0003 0613 6822

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of reports for annual source testing conducted at our facility March 30, 2005 and March 31, 2005 by TETCO, a Lehi, Utah testing company. All stack tests were conducted at worst-case normal conditions, as described at IDAPA 58.01.01.157.02.a. The report includes test data for the following sources at our Conda facility, listed with applicable Tier I Operating Permit 029-00003 sections limiting emissions:

Wet Process Phosphoric Acid Process Line (Section 6.1 and 6.26)
Superphosphoric Acid Production Process Line (Section 6.2 and 6.26)

In addition to the reports produced by TETCO, I have included operational monitored data and calculations demonstrating compliance/non-compliance for each test. This information is included with this letter as Supplements 1 & 2 to TETCO's report. Summaries of data and emissions calculations appear below:

<u>Wet Process Phosphoric Acid Process Line (Section 6.1 and 6.26)</u>

Test date: March 30, 2005

Permitted fluoride emissions:	0.0135 lb/Ton P_2O_5 feed
Fluoride emissions during test:	0.0014 lb/Ton P_2O_5 feed [In compliance]
P_2O_5 feed to process during test:	66.12 tons/hr
Pressure drop across Phos scrubber:	9.3 inches H_2O
Pressure drop across CV scrubber:	2.3 inches H_2O
Phos scrubber flow rate:	1201 gpm
CV scrubber flow rate:	216 gpm

* A Registered Name of Nu-West Industries, Inc.

Superphosphoric Acid Production Process Line (Section 6.2 and 6.26)

Test date: March 31, 2005	
Permitted fluoride emissions:	0.0087 lb/Ton P_2O_5 feed
Fluoride emissions during test:	0.0046 lb/Ton P_2O_5 feed [In-compliance]
P_2O_5 feed to process during test:	32.15 tons/hr
Pressure drop across SPA scrubber:	7.0 inches H_2O
SPA scrubber flow rate:	576 gpm

As indicated by the sampling data provided by TETCO and the summaries above, all of the source tests and calculations demonstrated compliance to permit limitations.

Opacity readings were performed at similar operating conditions after the tests, due to adverse weather conditions during the tests..

It is our pleasure and opportunity to provide you with this source test information. We appreciate DEQ's assistance in helping us maintain compliance with state and federal air quality regulations.

If you have any questions concerning this letter or the enclosed Compliance Report by TETCO, please call me at (208) 547-4381 extension 263.

Sincerely,

Monty Johnson
Environmental Manager

Attachments: Supplements 1& 2 to TETCO Repo
Enclosures: two (2) copies of TETCO reports for

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

444 Hospital Way #300 • Pocatello, Idaho 83201 • (208) 236-6160

Dirk Kempthorne, Governor
Toni Hardesty, Director

May 11, 2005

Certified Mail No. 7004 1350 0001 1692 9527

Mr. Charles H. Ross
General Manager
Nu-West Industries, Inc.; Agrium Conda Phosphate Operations
3010 Conda Road
Soda Springs, Idaho 83276

Subject: Annual Fluoride Performance Test on the Wet Process Phosphoric Acid Process; AIRS No. 029-00003

Dear Mr. Ross:

On April 29, 2005, the Department of Environmental Quality (DEQ) received a performance test report for the annual fluoride performance test on the wet process phosphoric acid process scrubbers at Nu-West Industries, Inc., Agrium Conda Phosphate Operations (Agrium's) Soda Springs facility. The scrubbers are referred to as the phosphoric acid plant scrubber (Unit A-Pa-1) and the conditioning vent scrubber (Unit A-Pp-3). TETCO conducted fluoride performance tests on the two scrubbers associated with this process in accordance with the Environmental Protection Agency's Method 13B on March 30, 2005. The tests were conducted to satisfy Permit Condition 6.17 of Tier I Operating Permit No. T1-030319, September 23, 2003, and Section 63.606(a)(1) of Subpart AA of Part 63 of Title 40 of the Code of Federal Regulations (40 CFR 63, Subpart AA). The performance tests were conducted in accordance with a protocol previously approved by DEQ for the 2004 annual tests.

Permit Condition 6.1 of Tier I Operating Permit No. T1-030319, September 23, 2003, establishes a fluoride emission limit for the superphosphoric acid process in accordance with 40 CFR 63.603(a). The emissions limit is 0.01350 pound per ton of equivalent phosphorous pentoxide (P_2O_5) feed. The total measured emissions from both scrubbers was 0.0014 pound per ton of equivalent P_2O_5 feed.

Based on a review of the submitted test report, DEQ has determined that the Method 13B tests on the wet process phosphoric acid process scrubbers successfully demonstrated compliance with the emissions limits listed in Permit Condition 6.1 of Tier I Operating Permit No. T1-030319, September 23, 2003, and 40 CFR 63.603(a) during the test period. **DEQ accepts the testing as a demonstration of compliance for this emission source when the wet process phosphoric acid process and associated scrubbers are operated in accordance with the Tier I operating permit and Subpart AA of 40 CFR 63.**

Permit Condition 6.35 of Tier I Operating Permit No. T1-030319, September 23, 2003, states, "The maximum allowable operating rate shall be limited to 120% of the average operating rate attained during any performance test period, for which a test protocol has been granted prior approval by DEQ, unless (1)

the test demonstrates noncompliance; (2) a more restrictive operating limit is specified elsewhere in this permit; or (3) at such an operating rate, emissions would exceed any emissions limit(s) set forth in this permit." The average operating rate achieved during this performance test was 66.1 tons of equivalent P_2O_5 feed per hour. **Therefore, the maximum allowable operating rate shall be limited to 79.3 tons of equivalent P_2O_5 feed per hour.**

Permit Condition 6.14 of Tier I Operating Permit No. T1-030319, September 23, 2003, and 40 CFR 63.605(d) require Agrium to indicate whether the allowable ranges for operating parameters for the scrubber liquid flow rate and pressure drop on the new performance test or the previously established range. In a letter to DEQ dated May 9, 2005, Agrium requested a new set of operating parameter ranges be established for the wet process phosphoric acid production process scrubbers based on operating data recorded during the March 30, 2005 performance tests.

During the test period, the scrubber liquid flow rate to the phosphoric acid plant scrubber was 1,201 gallons per minute and the pressure drop across the phosphoric acid plant scrubber was 9.25 inches water column. **Therefore, the allowable range for the scrubber liquid flow rate is 961 to 1,441 gallons per minute, and the allowable range for the pressure drop across the scrubber is 7.40 to 11.10 inches water column.**

During the test period, the scrubber liquid flow rate to the conditioning vent scrubber was 216 gallons per minute and the pressure drop across the phosphoric acid plant scrubber was 2.3 inches water column. **Therefore, the allowable range for the scrubber liquid flow rate is 173 to 259 gallons per minute, and the allowable range for the pressure drop across the scrubber is 1.8 to 2.8 inches water column.**

Please call me at (208) 236-6160 if you have any questions regarding this performance test evaluation.

Sincerely,

Richard Elkins
Air Quality Analyst

c: Michael Stambulis, Technical Services
Air Quality Stationary Source Program File
PRO Source File

AGR_009775

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY
444 Hospital Way #300
Pocatello, ID 83201

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Nu-West Industries, Inc.
Agrium Conda Phosphate Operations
Mr. Charles H. Ross-General Manager
3010 Conda Road
Soda Springs, Idaho 83276

Agrium

Agrium Conda Phosphate Operations*
3010 Conda Road
Soda Springs, ID 83276
Tel: 208-547-4381
Fax: 208-547-2550

April 26, 2005

File No.: EN-05-056

CERTIFIED MAIL #7001 0320 0003 0613 6822

Air Quality Permit Compliance
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way #300
Pocatello, Idaho 83201

Attn: Richard Elkins

RE: Compliance Test Reports

Dear Mr. Elkins,

Please find enclosed two (2) copies of our annual compliance reports for source tests conducted at our facility March 30, 2005 & March 31, 2005 by TETCO. Attached to the reports are Supplements 1& 2.

In accordance with IDAPA 58.01.01.123, and "based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

Sincerely,

Charles H Ross

Charles H. Ross
General Manager

CHR:mj
Enc. (2) copies of test report + (2) copies of Supplements 1& 2

* A Registered Name of Nu-West Industries, Inc.

FLUORIDE COMPLIANCE TESTS CONDUCTED ON THE PHOSPHORIC ACID PLANT STACK AND THE CONDITIONING VENT SCRUBBER STACK

FOR NU-WEST INDUSTRIES, INC.
AGRIUM CONDA PHOSHPATE OPERATIONS

SODA SPRINGS, IDAHO

March 30, 2005

by:

TETCO
90 East Main
Lehi, UT 84043
Phone: 801 768-0973
Fax: 801 768-0880

Prepared for:

Nu-West Industries, Inc., Agrium
3010 Conda Road
Soda Springs, ID 83276

Date of Report:

April 20, 2005

CERTIFICATION OF REPORT INTEGRITY

I hereby certify that the tests detailed in this report were accomplished in accordance with IDAPA 58.01.01.123 (*Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures*) and the *Procedures Manual for Air Pollution Control*. The results submitted herein are accurate and true to the best of my knowledge.

Dean A. Kitchen

Reviewer: Dean A Kitchen

Date: 4-20-05

Paul R. Kitchen

Reviewer: Paul R Kitchen

Date: 4-21-05

AGR_009778

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AGR_009779

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AGR_009780

INTRODUCTION

Test Purpose and Location

This testing project was conducted as part of Nu-West Industries, Inc., Agrium's (Agrium) stack testing requirements as specified in the facility's State of Idaho Tier I Operating Permit, Permit No. T1-030319, dated September 23, 2003. Those requirements call for annual fluoride testing at the Phosphoric Acid Plant Stack and the Conditioning Vent Scrubber Stack (previously known as the Secondary Phosphoric Acid Plant Stack, or PPA). Emissions are expressed in terms of pounds per dry standard cubic foot (lb/dscf), milligrams per dry standard cubic foot (mg/dscf), and pounds per hour (lb/hr). Pounds of fluoride per ton of 100 percent equivalent phosphoric pentoxide (P_2O_5) produced will be submitted by Agrium.

Test Dates

All testing was completed March 30, 2005.

Pollutants Tested and Methods Applied

Fluoride emissions were made according to EPA Method 13B. Testing was conducted according to the protocol submitted in 2004.

Test Participants

Test Facility	Agrium	Monty Johnson Clay Gentry
State Agency		None
Testing Contractor	TETCO	Paul Kitchen Dean Kitchen Doug Olsen Mike Ransom Brendan Goss

Deviations From EPA Methods

None.

Quality Assurance

Testing procedures and sample recovery techniques were according to those outlined in the Federal Register and the *Quality Assurance Handbook for Air Pollution Measurement Systems.*

AGR_009782

SUMMARY OF RESULTS

Emission Results

Table I shows the fluoride emission results. Tables IV and V in Appendix A have more detailed testing data.

Table I Measured Fluoride Emissions

Run #	Phosphoric Acid			Conditioning Vent Scrubber		
	lb/dscf	mg/dscf	lb/hr	lb/dscf	mg/dscf	lb/hr
1	3.38e-08	1.53E-02	0.13	1.74E-08	7.87E-03	0.008
2	1.70E-08	7.73E-03	0.07	1.65E-08	7.49E-03	0.008
3	1.66E-08	7.52E-03	0.07	1.20E-08	5.46E-03	0.006
AVE	**2.25E-08**	**1.02E-02**	**0.88**	**1.53E-08**	**6.94E-03**	**0.007**

Allowable Emissions

The allowable fluoride emissions for the Phosphoric Acid Plant Stack are 0.01350 lb/ton equivalent P_2O_5 feed as found in 40 CFR 63.603 (a).

Process Data

The process was operated according to standard procedures. All pertinent process information was available for recording by agency personnel. Production data will be submitted by Agrium personnel.

Discussion of Errors or Irregularities

None.

AGR_009783

Percent Isokinetic Sampling

The Method 13B test runs were isokinetic within the ±10% of 100% criterion specified in the Federal Register. Isokinetic values for each test run are presented in Table II.

TABLE II Percent Isokinetic Sampling

	Percent Isokinetics	
Run #	Phosphoric Acid	Conditioning Vent Scrubber
1	99	100
2	100	100
3	101	99

SOURCE OPERATION

Process Control Devices Operation

All control devices operated normally.

Process Representativeness

The facility was operated normally. Production data will be submitted by Agrium personnel.

SAMPLING AND ANALYTICAL PROCEDURES

Sampling Port Location

The Phosphoric Acid stack inside diameter was 81 inches. Two, four-inch diameter ports were available for testing. These ports were located 7.3 diameters (49 feet) downstream from the last disturbance and 2.1 diameters (14 feet) upstream from the next disturbance.

The Conditioning Vent Scrubber stack inside diameter was 24 inches. Two, four-inch diameter ports were available for testing. These ports were located approximately 9.0 diameters (18 feet) downstream from the last disturbance and 32 ½ diameters (65 feet) upstream from the next disturbance.

Figures 1 and 2 in Appendix E schematically depict these sources.

Sampling Point Location

Table III shows the distance of each sampling point from the inside wall according to EPA Method 1. Each point is marked and identified with a glass tape wrapping and numbered. Sample point position is determined by measuring the distance from the inside wall and adding the reference (port) measurement.

TABLE III Sampling Point Location

Sample Point	Distance (in. from inside wall)	
	Phosphoric Acid	Conditioning Vent Scrubber
1	3.56	1.06
2	11.83	3.50
3	23.98	7.10
4	57.02	16.90
5	69.17	20.50
6	77.44	22.94

AGR_009786

Sampling Train Description

All sampling trains were made of inert materials, (Teflon, stainless steel and glass) to prevent interference of the sampled gas and particulate. The stack analyzers used to conduct these tests are constructed to meet the specifications outlined in the CFR. The temperature sensors are K-type thermocouples. Heater, vacuum and pitot line connections have been designed to be interchangeable with all units used by the tester. A stainless steel probe liner was used for all tests. Figure 3 in Appendix F is a sketch of the Method 13B sampling train. Sample boxes were prepared for testing by following the prescribed procedure outlined in Method 13B.

Sampling and Analytical Procedures

All sampling and analytical test procedures employed were as specified in 40 CFR 60 Appendix A, Method 13B and as specified in the test protocol.

Quality Assurance

All equipment set-up, sampling procedures, sample recovery and equipment calibrations were carried out according to the procedures specified in 40 CFR 60, Appendix A, Method 13B, as specified in the test protocol, and the *Quality Assurance Handbook for Air Pollution Measurement Systems.*

AGR_009787

APPENDIX

A: Complete Results and Sample Calculations
B: Raw Field Data
C: Laboratory Data and Chain of Custody
D: Summary Formats
E: Raw Production Data
F: Calibration Procedures and Results
G: Related Correspondence

AGR_009788

APPENDIX A

Table IV Complete Results Phosphoric Acid
Table V Complete Results Conditioning Vent Scrubber
Sample Equations
Method 5 and 13 B Nomenclature and Sample Equations

AGR_009789

TABLE IV
COMPLETE RESULTS
AGRIUM
PHOSPHORIC ACID PLANT SCRUBBER EXHAUST

Symbol	Description	Dimensions	Run #1	Run #2	Run #3	
Date			3/30/05	3/30/05	3/30/05	
Begin	Time Test Began		13:32	15:16	16:45	
End	Time Test Ended		14:34	16:19	17:47	
Pb_m	Meter Barometric Pressure	In. Hg. Abs	23.65	23.65	23.65	
ΔH	Orifice Pressure Drop	In. H_2O	1.679	1.755	1.743	
Y	Meter Calibration Y Factor	dimensionless	1.004	1.004	1.004	
Vm	Volume Gas Sampled--Meter Conditions	cf	49.170	50.256	49.981	
T_m	Avg Meter Temperature	°F	79.9	83.7	80.3	
$\sqrt{\Delta P}$	Sq Root Velocity Head	Root In. H_2O	0.6460	0.6483	0.6457	
Wt_{wc}	Weight Water Collected	Grams	37.9	36.8	39.0	
T_t	Duration of Test	Minutes	60	60	60	
C_p	Pitot Tube Coefficient	Dimensionless	0.84	0.84	0.84	
D_n	Nozzle Diameter	Inches	0.2545	0.2545	0.2545	
CO_2	Volume % Carbon Dioxide	Percent	1.80	1.80	1.60	
O_2	Volume % Oxygen	Percent	20.20	20.40	20.80	
N_2 & CO	Volume % Nitrogen and Carbon Monoxide	Percent	78.00	77.80	77.60	
Vm_{std}	Volume Gas Sampled (Standard)	dscf	38.361	38.943	38.972	
Vw	Volume Water Vapor	scf	1.787	1.735	1.839	
Bw_s	Fraction H_2O in Stack Gas	Fraction	0.045	0.043	0.045	
X_d	Fraction of Dry Gas	Fraction	0.955	0.957	0.955	
M_d	Molecular Wt. Dry Gas	lb/lbmol	29.10	29.10	29.09	
M_s	Molecular Wt. Stack Gas	lb/lbmol	28.60	28.63	28.59	
%I	Percent Isokinetic	Percent	99.0	100.0	100.7	AVG
T_s	Avg Stack Temperature	°F	82.8	83.5	83.3	83
A_s	Stack Cross Sectional Area	Sq. Ft.	35.785	35.785	35.785	
P_G	Stack Static Pressure	In. H_2O	-0.21	-0.21	-0.21	
Pb_p	Sample Port Barometric Pressure	In. Hg. Abs	23.59	23.59	23.59	
P_s	Stack Pressure	In. Hg. Abs	23.575	23.575	23.575	
Q_s	Stack Gas Volumetric Flow Rate (Std)	dscfm	6.54E+04	6.57E+04	6.54E+04	**6.55E+04**
Q_a	Stack Gas Volumetric Flow Rate (Actual)	cfm	8.94E+04	8.97E+04	8.94E+04	**8.95E+04**
V_s	Velocity of Stack Gas	fpm	2.50E+03	2.51E+03	2.50E+03	**2.50E+03**
$M_{F\ Gross}$	Mass of Fluoride in Sample	mg	0.588	0.301	0.293	
$M_{F\ Blank}$	Mass of Fluoride in Sample Blank	mg	0.00	0.00	0.00	
$M_{F\ Net}$	Net Mass of Fluoride in Sample	mg	0.588	0.301	0.293	
C_F	Concentration of Fluoride	lb / dscf	3.38E-08	1.70E-08	1.66E-08	**2.25E-08**
C_F	Concentration of Fluoride	mg/dscf	1.533E-02	7.729E-03	7.518E-03	**1.019E-02**
ER_F	Emission Rate of Fluoride	lb / hr	0.133	0.067	0.065	**0.088**

TABLE V
COMPLETE RESULTS
AGRIUM CONDA PHOSPHATE
CONDITIONING VENT SCRUBBER

Symbol	Description	Dimensions	Run #1	Run #2	Run #3	
Date			3/30/05	3/30/05	3/30/05	
Begin	Time Test Began		13:32	15:16	16:45	
End	Time Test Ended		14:34	16:19	17:47	
Pb_m	Meter Barometric Pressure	In. Hg. Abs	23.77	23.77	23.77	
ΔH	Orifice Pressure Drop	In. H_2O	1.501	1.618	1.676	
Y	Meter Calibration Y Factor	dimensionless	1.016	1.016	1.016	
Vm	Volume Gas Sampled–Meter Conditions	cf	49.460	51.812	52.519	
T_m	Avg Meter Temperature	°F	71.0	72.8	80.8	
$\sqrt{\Delta P}$	Sq Root Velocity Head	Root In. H_2O	0.8337	0.8645	0.8806	
Wt_{wc}	Weight Water Collected	Grams	20.5	16.9	22.1	
T_t	Duration of Test	Minutes	60	60	60	
C_p	Pitot Tube Coefficient	Dimensionless	0.84	0.84	0.84	
D_n	Nozzle Diameter	Inches	0.2220	0.2220	0.2220	
CO_2	Volume % Carbon Dioxide	Percent	0.00	0.00	0.00	
O_2	Volume % Oxygen	Percent	20.90	20.90	20.90	
N_2 & CO	Volume % Nitrogen and Carbon Monoxide	Percent	79.10	79.10	79.10	
Vm_{std}	Volume Gas Sampled (Standard)	dscf	39.881	41.651	41.603	
Vw	Volume Water Vapor	scf	0.967	0.797	1.042	
Bw_s	Fraction H_2O in Stack Gas	Fraction	0.023	0.019	0.022	
X_d	Fraction of Dry Gas	Fraction	0.977	0.981	0.978	
M_d	Molecular Wt. Dry Gas	lb/lbmol	28.84	28.84	28.84	
M_s	Molecular Wt. Stack Gas	lb/lbmol	28.59	28.63	28.59	
%I	Percent Isokinetic	Percent	100.0	100.3	98.7	**AVG**
T_s	Avg Stack Temperature	°F	60.9	60.5	60.6	**61**
A_s	Stack Cross Sectional Area	Sq. Ft.	3.142	3.142	3.142	
P_G	Stack Static Pressure	In. H_2O	-0.49	-0.49	-0.49	
Pb_p	Sample Port Barometric Pressure	In. Hg. Abs	23.77	23.77	23.77	
P_s	Stack Pressure	In. Hg. Abs	23.734	23.734	23.734	
Q_s	Stack Gas Volumetric Flow Rate (Std)	dscfm	7.77E+03	8.09E+03	8.21E+03	**8.02E+03**
Q_a	Stack Gas Volumetric Flow Rate (Actual)	cfm	9.89E+03	1.02E+04	1.04E+04	**1.02E+04**
V_s	Velocity of Stack Gas	fpm	3.15E+03	3.26E+03	3.32E+03	**3.24E+03**
$M_{F\ Gross}$	Mass of Fluoride in Sample	mg	0.314	0.312	0.227	
$M_{F\ Blank}$	Mass of Fluoride in Sample Blank	mg	0.00	0.00	0.00	
$M_{F\ Net}$	Net Mass of Fluoride in Sample	mg	0.314	0.312	0.227	
C_F	Concentration of Fluoride	lb / dscf	1.74E-08	1.65E-08	1.20E-08	**1.53E-08**
C_F	Concentration of Fluoride	mg/dscf	7.873E-03	7.491E-03	5.456E-03	**6.940E-03**
ER_F	Emission Rate of Fluoride	lb / hr	0.008	0.008	0.006	**0.007**

M5 13B Nomenclature

$\%I$ = percent isokinetic, percent
A_s = stack cross-sectional area (ft^3)
$AS\Delta P$ = see $\sqrt{\Delta P}$
Btu = unit heat value (British thermal unit)
B_{ws} = fraction of water in stack gas
C_B = concentration of particulate matter, back half (gr/dscf,lb/dscf, etc.)
CB_{back} = concentration of pollutant in back half blank (i.e., mg). "Back" may be replaced with "water" or "acetone", etc.
CB_{front} = concentration of pollutant in front half blank (i.e., mg)
C_f = concentration of particulate matter, front half (gr/dscf,lb/dscf, etc.)
C_{metal} = concentration of metals (ppm, $\mu g/ft^3$, etc.) atomic symbol replaces "metal"
CO_2 = percent carbon dioxide in the stack gas
C_p = pitot tube coefficient (0.84)
CX_{back} = concentration of pollutant in back half, species identifier replaces "X" (lb/dscf)
CX_{front} = concentration of pollutant in front half, species identifier replaces "X" (lb/dscf)
$C_{X\ (avg)}$ = species symbol replaces x.
$C_{X\ (corr)}$ = actual gas concentration corrected to required percent O_2
ΔH = orifice pressure drop (inches H_2O)
$\Delta H_@$ = orifice pressure (inches H_2O)
ΔP = stack flow pressure differential (inches H_2O)
D_s = diameter of the stack (feet)
D_n = nozzle diameter (inches)
EA = percent excess air
ER_B = emission rate of back half particulate (lb/hr)
ER_F = emission rate of front half particulate (lb/hr)
ER_{mmBtu} = emission rate per mmBtu or ton of fuel etc.
ER_X = emission rate of compound which replaces x
ERX_{front} = front half emission rate of compount which replaces "X"
ERX_{back} = back half emission rate of compount which replaces "X"
k-fact = multiplier of test point ΔP to determine test point ΔH
L = length of rectangular stack (inches)
mBtu = thousand Btu
MB_{front} = mass of pollutant in front half blank (i.e., mg)
MB_{back} = mass of pollutant in back half blank (i.e., mg)
M_d = molecular weight of stack gas, dry basis (lb/lb-mol)
M_F = mass of particulate on filter (mg)
M_{FP} = mass of particulate matter on filter and probe (mg)
mmBtu = million Btu
M_P = mass of particulate matter in probe (mg)
M_s = molecular weight of stack gas, wet basis (g/gmol)
M_{Xfront} = mass of pollutant in front half before applying blank, species symbol replaces "X" (mg)
MX_{front} = total mass of pollutant in front half, species symbol replaces "X" (mg)
M_{Xback} = mass of pollutant in back half before applying blank, species symbol replaces "X" (mg)
MX_{back} = total mass of pollutant in back half, species symbol replaces "X" (mg)
N_2 = percent nitrogen in the stack gas
O_2 = percent oxygen in the stack gas
$\sqrt{\Delta P}$ = average of the square roots of ΔP (may also be referred to as $AS\Delta P$)

M5 13B Nomenclature

Pb_m = absolute barometric pressure at the dry gas meter (inches Hg)
Pb_p = absolute barometric pressure at the sample location (inches Hg)
P_G = stack static pressure (inches H_2O)
P_s = absolute stack pressure (inches Hg)
P_{std} = absolute pressure at standard conditions (29.92 inches Hg.)
θ = time of test (minutes)
Q_a = stack gas volumetric flow rate (acfm)
Q_s = stack gas volumetric flow rate (dscfm)
Q_W = wet stack gas std. volumetric flow (ft^3/min, wscfm)
T_s = stack temperature (^oF)
T_{std} = absolute temperature at standard conditions (528^oR)
Tt = see θ
u_m = mean molecular speed (cm/s)
Vm = sample volume (ft^3) at meter conditions
Vm_{std} = volume standard (dscf), sample volume adjusted to 68^oF and 29.92 inches Hg.
V_s = velocity of stack gas (fpm)
V_{wc} = volume water vapor (scf) at 68^oF and 29.92 inches Hg.
W = Width of rectangular stack (inches)
Wt_{wc} = weight of the condensed water collected (grams)
X_d = fraction of dry gas
Y = meter calibration Y-factor (dimensionless)

Method 5 13B Equations

$$\%I = Vm_{std} \cdot (T_s + 460) \cdot 1039 / (\theta \cdot V_s \cdot P_s \cdot X_d \cdot D_n^2)$$

$$A_s = Ds^2 / 4 \cdot \pi$$

$$B_{ws} = V_w / (Vm_{std} + V_w)$$

$$C_B = M_B \cdot 0.01543 / Vm_{std}$$

$$C_f = M_{fp} \cdot 0.01543 / Vm_{std}$$

$$CX_{front} = MX_{front} / (Vm_{std} \cdot 1000 \cdot 453.6)$$

$$CX_{back} = MX_{back} / (Vm_{std} \cdot 1000 \cdot 453.6)$$

$$C_{X\,(corr)} = C_{X\,(avg)} \cdot (20.9 - \text{desired } \%O_2) / (20.9 - \text{actual } \%O_2)$$

$$D_{eq} = 2 \cdot L \cdot W / (L + W)$$

$$EA = (\%O_2 - 0.5\ \%CO) / [0.264\ \%N_2 - (\%O_2 - 0.5\ \%CO)]$$

$$ER_B = C_B \cdot Q_s \cdot 0.00857$$

$$ER_F = C_f \cdot Q_s \cdot 0.00857$$

$$ER_{mmBtu} = ER_X / (\text{mmBtu / hr})$$

$$ERX_{front} = CX_{front} \cdot Q_s \cdot 60$$

$$ERX_{back} = CX_{back} \cdot Q_s \cdot 60$$

$$\text{K-fact} = 846.72 \cdot Dn^4 \cdot \Delta H_@ \cdot C_p^2 \cdot X_d^2 \cdot M_d \cdot P_s \cdot (T_m + 460) / [M_s \cdot (T_s + 460) \cdot (Pb_m + \Delta H / 13.6)]$$

$$M_d = CO_2 \cdot 0.44 + O_2 \cdot 0.32 + N_2 \cdot 0.28$$

$$M_s = (M_d \cdot X_d) + (18 \cdot B_{ws})$$

$$P_s = Pb_p + (P_G / 13.6)$$

$$Q_a = V_s \cdot A_s$$

$$Q_s = Qa \cdot Xd \cdot Ps \cdot T_{std} / [(Ts + 460) \cdot P_{std}]$$

$$Q_W = Q_s / X_d$$

$$Vm_{std} = Vm \cdot Y \cdot T_{std} \cdot (Pb_m + \Delta H / 13.6) / [P_{std} \cdot (T_m + 460)]$$

$$V_s = 85.49 \cdot 60 \cdot Cp \cdot \sqrt{\Delta P} \cdot \sqrt{[(T_s + 460) / (P_s \cdot M_s)]}$$

$$V_{wc} = Wt_{wc} \cdot 0.04715$$

$$X_d = 1 - B_{ws}$$

APPENDIX B

Phosphoric Acid
- Preliminary Velocity Traverse and Sampling Point Location Data
- Method 13B Field Data Sheets

Conditioning Vent Scrubber
- Preliminary Velocity Traverse and Sampling Point Location Data
- Method 13B Field Data Sheets

AGR_009795

13 B Field Data Sheet

TETCO

Filter Paper Sample Box A

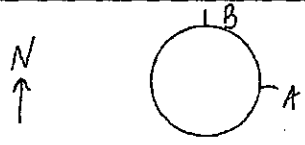
Page 1 of 1 Run # 1

Plant: Agrium, Conda Phosphate Operations

Date: March 30, 2005

Location: Phosphoric Acid Plant Scrubber

Operator: Paul R Kitchen



Stack Diameter 81" Port Reference 7"

Ports are 14' Upstream from next disturbance

Ports are 49' Downstream from last disturbance

Traverse Point	Time Clock	Time Min (0)	DGM (ft³)	ΔP (in H₂O)	ΔH (in H₂O) Desired	ΔH (in H₂O) Actual	Vacuum (in Hg)	Temperatures (°F) Stack (T_s)	Probe	Probe Out	Filter	Effluent	DGM Temp (T_m) Out	In
A 1	13:32	0	169.539	.36	1.42	1.42	3.0	82	242	x	x	48	64	64
2		5	173.276	.40	1.58	1.58	3.0	82	251	x	x	43	64	67
3		10	177.233	.42	1.66	1.66	4.0	82	258	x	x	41	66	75
4		15	181.284	.46	1.82	1.82	4.0	83	270	x	x	41	67	81
5		20	185.542	.46	1.82	1.82	4.0	83	256	x	x	42	70	88
6		25	189.793	.41	1.65	1.65	4.0	82	246	x	x	42	73	93
B 1	14:04	30	193.879	.32	1.29	1.29	4.0	83	226	x	x	44	76	88
2		35	197.496	.34	1.37	1.37	4.0	83	218	x	x	42	77	92
3		40	201.276	.38	1.53	1.53	4.0	83	223	x	x	41	79	94
4		45	205.151	.41	1.65	1.65	4.0	83	221	x	x	40	80	96
5		50	209.253	.54	2.18	2.18	5.0	83	225	x	x	41	81	99
6		55	213.970	.54	2.18	2.18	5.0	84	230	x	x	41	82	102
	14:34	60	218.769											
Total			49.170	7.7525		20.15		993					1918	
Average				.6460		1.679		82.8					79.9	

Assumed Moisture 4 %

Probe 84 G Cp 0.84

Nozzle Calibration

.255 .255 .254 .254

Avg D_n .2545 inches

Gas Bag X-2

Console 6

Y-Factor 1.004

$\Delta H_@$ 1.714 in H_2O

Barometric Pressures

Pb_m 23.65 in Hg

Pb_s 23.59 in Hg

P_g -.21 in H_2O

Leak Check:	Pre	Post
ft³/min	0.002	0.000
vac in Hg	21.0	6.0
Pitot Rate	0.00	0.00
in H_2O	9.0	9.0

Water Collected 37.9 g

Time Sampled 60 min

Review

K = @T_m

K = @T_m

Comments:

AGR_009796

13 B Field Data Sheet

TETCO

Filter Paper Sample Box B

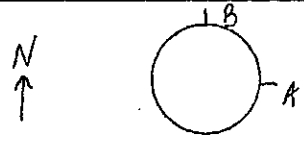
Page 1 of 1 Run # 2

Plant: Agrium, Conda Phosphate Operations

Date: March 30, 2005

Location: Phosphoric Acid Plant Scrubber

Operator: Paul R Kitchen



Stack Diameter 81" Port Reference 7"

Ports are 14' Upstream from next disturbance

Ports are 49' Downstream from last disturbance

Traverse Point	Time Clock	Time Min (0)	DGM (ft³)	ΔP (in H₂O)	ΔH (in H₂O) Desired	ΔH (in H₂O) Actual	Vacuum (in Hg)	Temperatures (°F) Stack (T_s)	Probe	Probe Out	Filter	Effluent	DGM Temp (T_m) Out	In
A 1	15:10	0	219.313	.39	1.62	1.62	3.0	83	226	x	x	42	74	73
2		5	223.341	.41	1.70	1.70	3.0	83	241	x	x	39	74	76
3		10	227.455	.45	1.87	1.87	4.0	84	231	x	x	39	74	84
4		15	231.764	.48	1.99	1.99	4.0	83	233	x	x	39	76	91
5		20	236.231	.46	1.91	1.91	4.0	83	244	x	x	40	77	96
6		25	240.626	.41	1.70	1.70	4.0	83	261	x	x	41	79	99
B 1	15:49	30	244.787	.32	1.33	1.33	3.0	83	232	x	x	42	81	90
2		35	248.500	.32	1.33	1.33	3.0	84	220	x	x	42	81	93
3		40	252.179	.38	1.58	1.58	4.0	84	231	x	x	43	80	92
4		45	256.145	.50	2.08	2.08	5.0	84	239	x	x	43	79	92
5		50	260.677	.50	2.08	2.08	5.0	84	243	x	x	43	78	95
6		55	265.233	.45	1.87	1.87	5.0	84	238	x	x	43	78	96
	16:19	60	269.569											
Total			50.256	7.7798		21.06		1002					2008	
Average				.6483		1.755		83.5					83.7	

Assumed Moisture 2 %

Probe 84G Cp 0.84

Nozzle Calibration

.255 .255 .254 .254

Avg D_n .2545 inches

Gas Bag X-6

Console 6

Y-Factor 1.004

$\Delta H_@$ 1.714 in H_2O

Barometric Pressures

Pb_m 23.65 in Hg

Pb_p 23.59 in Hg

P_g -.21 in H_2O

Leak Check:	Pre	Post
ft³/min	0.006	0.001
vac in Hg	21.0	6.0

Pitot Rate	0.00	0.00
in H_2O	9.0	9.0

Water Collected 36.8 g

Time Sampled 60 min

Review

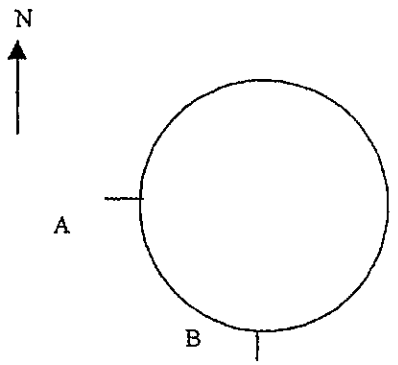
K = @T_m

K = @T_m

Comments:

AGR_009797

Preliminary (3)



Stack Dia. 24" Reference: 12

Ports are 65' Upstream from next disturbance

Ports are 18' Downstream from last disturbance

Facility Agrium, Conda Phosphate Operations

Stack Identification Secondary Phosphoric Acid Plant Scrubber

Date 3-30-05

Barometric Pressure

Pb_m 23.77 in Hg Pb_p 23.77 in Hg

Static Pressure (P_G) -.49 in H_2O

Estimated Moisture (Bw_s) ~~4-Jan~~ 04 %

Sample Height from Ground _____ feet

Comments:

Traverse Point	Percent Diameter	Distance From: ID	Distance From: Reference	Ports A	B	C	D	E	F
1	4.4	1.06	13.06	4	3				
2	14.6	3.50	15.50	2	2				
3	29.6	7.10	19.10	1	1				
4	70.4	16.90	28.90	1	1				
5	85.4	20.50	32.50	2	3				
6	95.6	22.94	34.94	4	5				

Averages:

T_s _____ ∠ Flow _____

ΔP _____ √ΔP _____

KEY => T_s ∠ Flow ΔP

AGR_009798

13B Field Data Sheet

TETCO

Filter paper Sample Box D

Page 1 of 1 Run # 1

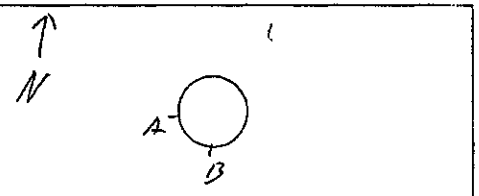
Plant: Agrium, Conda Phosphate Operations

Date: 3-30-05

Location: Secondary Phosphate Acid Plant Scrubber (PPA)

Operator: D. Kitchen

Traverse Point	Time Clock	Time Min (θ)	DGM (ft³)	ΔP (in H₂O)	ΔH (in H₂O) Desired	ΔH (in H₂O) Actual	Vacuum (in Hg)	Temperatures (°F) Stack (T_s)	Probe	Probe Out	Filter	Effluent	DGM Temp (T_m) Out	In
B 1	1432 PM	0	48.901	.65	1.26	1.26	4	60	132	x	x	43	58	58
2		5	52.880	.82	1.74	1.74	5	61	125	x	x	41	58	59
3		10	57.250	.82	1.74	1.74	5	61	126	x	x	38	60	62
4		15	61.600	.84	1.78	1.78	5	61	129	x	x	39	62	67
5		20	66.070	.91	1.93	1.93	5	61	129	x	x	40	65	73
6		25	70.720	.86	1.83	1.83	5	61	134	x	x	41	67	76
A 1	1504 PM	30	75.345	.82	1.40	1.40	4	61	142	x	x	41	70	78
2		35	79.280	.68	1.46	1.46	4	61	142	x	x	41	72	79
3		40	83.390	.61	1.31	1.31	4	60	145	x	x	41	73	81
4		45	87.480	.58	1.25	1.25	4	61	148	x	x	41	75	83
5		50	91.100	.53	1.14	1.14	4	61	148	x	x	42	77	86
6		55	94.820	.50	1.07	1.07	4	62	148	x	x	44	79	87
	1534	60	98.361											
	1434													
Total			49.460	10.0049	18.01			731					1205	
Average				0.8337	1.501			60.9					71.0	



Stack Diameter 24" Port Reference 12"

Ports are 65' Upstream from next disturbance

Ports are 18' Downstream from last disturbance

Assumed Moisture 4 %

Probe 41 Cp 0.84

Nozzle Calibration

.221 .222 .222 .223

Avg D_n .2220 inches

Gas Bag Amb. Air

Console 5

Y-Factor 1.016

$\Delta H_@$ 1.518 in H_2O

Barometric Pressures

Pb_m 23.77 in Hg

Pb_s 23.77 in Hg

P_s -.49 in H_2O

Leak Check	Pre	Post
ft³/min	.005	.000
vac in Hg	20.0	5.0
Pitot Rate	0.0	0.0
in H_2O	7.0	7.0

Water Collected 20.5 g

Time Sampled 60 min min

Review

K = 2.48 @T_m 80

K = 2.45 @T_m 80

Comments.

≈ V_{std} ~~38.7~~ 39.881

V_s = 3146.7

q_a = 9886.9

q_s = 7775.

AGR_009799

13B Field Data Sheet

TETCO

Filter paper Sample Box E

Page 1 of 1 Run # 2

Plant: Agrium, Conda Phosphate Operations

Date: 3-30-05

Location: Secondary Phosphate Acid Plant Scrubber (PPA)

Operator: D. Kitchen

N

A B

Stack Diameter 24" Port Reference 12"

Ports are 65' Upstream from next disturbance

Ports are 18' Downstream from last disturbance

Traverse Point	Time Clock	Time Min (θ)	DGM (ft³)	ΔP (in H₂O)	ΔH (in H₂O) Desired	ΔH (in H₂O) Actual	Vacuum (in Hg)	Temperatures (°F) Stack (T_s)	Probe	Probe Out	Filter	Effluent	DGM Temp (T_m) Out	In
13 1	~~1618~~	0	99.462	.73	1.57	1.57	5	60	167	x	x	37	69	68
2		5	103.850	.83	1.79	1.79	5	61	158	x	x	37	70	69
3		10	108.400	.83	1.79	1.79	5	61	155	x	x	37	68	70
4		15	112.900	.92	1.98	1.98	5	61	150	x	x	38	68	72
5		20	117.610	.92	1.98	1.98	5	61	148	x	x	38	69	74
6		25	122.330	.88	1.89	1.89	5	61	145	x	x	39	69	77
A 1	~~1647~~	30	126.868	.52	1.12	1.12	4	60	150	x	x	39	70	77
2	1644	35	130.520	.65	1.40	1.40	5	60	147	x	x	40	71	77
3		40	134.510	.70	1.50	1.50	5	60	148	x	x	41	72	78
4		45	138.665	.70	1.50	1.50	5	60	150	x	x	42	72	79
5		50	142.810	.75	1.61	1.61	5	61	152	x	x	43	73	80
6		55	147.050	.60	1.29	1.29	5	60	151	x	x	44	74	81
	~~1719~~	60	151.274											
	1619													
Total			51.812	10.2742	19.42		726						1747	
Average				.8645	1.618		60.5						72.8	

Assumed Moisture 4 %

Probe 4/ Cp 0.84

Nozzle Calibration

.221 .222 .222 .223

~~.2280~~ Avg D_n .2220 inches

Gas Bag Amb. Air

Console 5

Y-Factor 1.016

$\Delta H_@$ 1.518 in H_2O

Barometric Pressures

Pb_m 23.77 in Hg

Pb_s 23.77 in Hg

P_s -.49 in H_2O

Leak Check	Pre	Post
cf/min	.010	0.003
vac in Hg	20.0	6.0
Pitot Rate	0.0	0.0
in H_2O	7.0	7.0

Water Collected 16.9 g

Time Sampled 60 min

Review

K = 2.68 @T_m

K = @T_m

Comments

$V_{m std}$ = 41.651 V_s = 2262

q_a = 10,248

q_s = 8065

AGR_009800

13B Field Data Sheet

TETCO

Filter paper Sample Box F

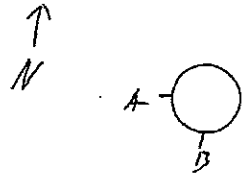
Page 1 of 1 Run # 3

Plant: Agrium, Conda Phosphate Operations

Date: 3-30-05

Location: Secondary Phosphate Acid Plant Scrubber (PPA)

Operator: D. Kitchen



Stack Diameter 24" Port Reference 12"

Ports are 65' Upstream from next disturbance

Ports are 18' Downstream from last disturbance

Traverse Point	Time Clock	Time Min (θ)	DGM ft³	ΔP in H₂O	ΔH (in H₂O) Desired	ΔH (in H₂O) Actual	Vacuum in Hg	Temperatures (°F) Stack (T_s)	Probe	Probe Out	Filter	Effluent	DGM Temp (T_m) Out	In
B 1	1645	0	51.735	.70	1.51	1.57	4	60	159	x	x	37	71	70
2		5	55.810	.82	1.77	1.77	5	60	159	x	x	38	71	72
3		10	60.310	.82	1.77	1.77	5	61	160	x	x	39	73	78
4		15	64.800	.90	1.94	1.94	5	61	165	x	x	40	74	79
5		20	69.400	.90	1.94	1.94	5	61	165	x	x	38	75	83
6		25	74.065	.95	1.83	1.83	5	61	167	x	x	36	77	85
A 1	1717	30	78.658	.60	1.29	1.29	4	60	172	x	x	38	79	87
2		35	82.590	.65	1.40	1.40	4	60	172	x	x	36	80	87
3		40	86.630	.72	1.54	1.54	5	61	175	x	x	39	81	89
4		45	90.900	.77	1.66	1.66	5	61	175	x	x	35	83	91
5		50	95.270	.86	1.85	1.85	5	61	174	x	x	34	84	92
6		55	99.965	.75	1.61	1.61	5	60	172	x	x	34	85	93
	1747	60	104.254											
Total			52.519	10.5673	20.11			727					1939	
Average				0.8806	1.676			60.6					80.8	

Assumed Moisture 4 %

Probe 41 Cp 0.84

Nozzle Calibration .221 .222 .222 .223

1911 Avg D_n .222 inches

Gas Bag Amb. Air

Console 5

Y-Factor 1.016

$\Delta H_@$ 1.518 in H_2O

Barometric Pressures

Pb_m 23.77 in Hg

Pb_p 23.77 in Hg

P_s -.49 in H_2O

Leak Check	Pre	Post
ft³/min	.002	.000
vac in Hg	20.0	6.0
Pitot Rate	0.0	0.0
in H_2O	7.0	7.0

Water Collected 22.1 g

Time Sampled 60 min

Review

K = 2.15 @T_m 25

K = @T_m

Comments:

V_{mstd} = 41.603

V_s = 3223

Q_a = 10,440

Q_s = 8215

AGR_009801

APPENDIX C

Laboratory Data

Phosphoric Acid
- Sample Recovery Sheets
- Gas Analysis Data

Conditioning Vent Scrubber
- Sample Recovery Sheets
- Gas Analysis Data (Ambient Air)

Fluoride Analysis Information

Chain of Custodies

Impinger Field Sheet

Facility: Agrium

Stack Identification: Phosphoric Acid Plant Scrubber

Date: 3-30-05

Method: 13 B

IMPINGERS

Run: 1

Sample Box: A

Filter Number: paper

	Impinger Number 1	2	3	4	5	6	Initials
Initial Volume of liquid (H_2O) in impingers, (ml)	100	100	–	5.6			PRK
Final (g)	766.8	658.2	595.1	891.3			DJL
Initial (g)	692.5	652.6	595.1	882.3			
Net (g)	23.3	5.6	0.0	9.0			

Total (g) 37.9

RINSES

H_2O		CH_2Cl_2	
Final	g	Final	g
Initial	g	Initial	g
Net	g	Net	g ÷ 1.32 g/ml = ml

PK

IMPINGERS

Run: 2

Sample Box: B

Filter Number: paper

	Impinger Number 1	2	3	4	5	6	Initials
Initial Volume of liquid (H_2O) in impingers, (ml)	100	100	–	5.6			PRK
Final (g)	699.7	618.0	509.5	890.5			DJL
Initial (g)	676.0	612.4	508.8	883.7			
Net (g)	23.7	5.6	0.7	6.8			

Total (g) 36.8

RINSES

H_2O		CH_2Cl_2	
Final	g	Final	g
Initial	g	Initial	g
Net	g	Net	g ÷ 1.32 g/ml = ml

PK

IMPINGERS

Run: 3

Sample Box: C

Filter Number: paper

	Impinger Number 1	2	3	4	5	6	Initials
Initial Volume of liquid (H_2O) in impingers, (ml)	100	100	–	5.6			PRK
Final (g)	646.4	642.9	606.2	921.8			DJL
Initial (g)	621.0	637.3	605.6	914.4			
Net (g)	25.4	5.6	0.6	7.4			

Total (g) 39.0

RINSES

H_2O		CH_2Cl_2	
Final	g	Final	g
Initial	g	Initial	g
Net	g	Net	g ÷ 1.32 g/ml = ml

PK

AGR_009803

Plant Agrium
Analytical Method ORSAT

Location Phosphoric Acid Plant Scrubber

Date 3/30/05
Test No. 1
Gas Bag No. X-2
Ambient Temp 62
Operator PRK

Gas	RUN 1 Actual Reading	RUN 1 Net	RUN 2 Actual Reading	RUN 2 Net	RUN 3 Actual Reading	RUN 3 Net	Average Net Volume
CO_2	1.8	1.8	1.8	1.8	1.8	1.8	1.8
O_2 (Net is Actual O_2 Reading Minus Actual CO_2 Reading).	22.0	20.2	22.0	20.2	22.0	20.2	20.2
N_2 (Net is 100 Minus Actual O_2 Reading).		78.0		78.0		78.0	78.0

Date 3/30/05
Test No. 2
Gas Bag No. X-6
Ambient Temp 64
Operator PRK

Gas	RUN 1 Actual Reading	RUN 1 Net	RUN 2 Actual Reading	RUN 2 Net	RUN 3 Actual Reading	RUN 3 Net	Average Net Volume
CO_2	1.8	1.8	1.8	1.8	1.8	1.8	1.8
O_2 (Net is Actual O_2 Reading Minus Actual CO_2 Reading).	22.2	20.4	22.2	20.4	22.2	20.4	20.4
N_2 (Net is 100 Minus Actual O_2 Reading).		77.8		77.8		77.8	77.8

Date 3/30/05
Test No. 3
Gas Bag No. X-2
Ambient Temp 58
Operator PRK

Gas	RUN 1 Actual Reading	RUN 1 Net	RUN 2 Actual Reading	RUN 2 Net	RUN 3 Actual Reading	RUN 3 Net	Average Net Volume
CO_2	1.6	1.6	1.6	1.6	1.6	1.6	1.6
O_2 (Net is Actual O_2 Reading Minus Actual CO_2 Reading).	22.4	20.8	22.4	20.8	22.4	20.8	20.8
N_2 (Net is 100 Minus Actual O_2 Reading).		77.6		77.6		77.6	77.6

CO is not measured, as it has the same molecular weight as N_2

Impinger Field Sheet

Facility: Agrigen

Stack Identification: ~~OK~~ PPA

Date: 3-~~29~~ 30 ~~05~~ DM

Method: 13 B

IMPINGERS

Run: 1 Sample Box: D

Filter Number: Paper

	Impinger Number 1	2	3	4	5	6
Initial Volume of liquid (H_2O) in impingers, (ml)						
Final (g)	629.0	621.8	596.5	914.8		
Initial (g)	619.4	619.9	595.9	906.4		
Net (g)	9.6	1.9	0.6	8.4		

Initials: DK PRK

Total (g) 20.5

RINSES

H_2O: Final 1104 g; Initial 104 g; Net ____ g

CH_2Cl_2: Final ____ g; Initial ____ g; Net ____ g + 1.32 g/ml = ____ ml DM

IMPINGERS

Run: 2 Sample Box: E

Filter Number: Paper

	Impinger Number 1	2	3	4	5	6
Initial Volume of liquid (H_2O) in impingers, (ml)	100	100	Ø	S.G		
Final (g)	729.4	598.5	550.8	984.8		
Initial (g)	722.5	596.0	550.2	977.9		
Net (g)	6.9	2.5	0.6	6.9		

Initials: DK PRK

Total (g) 16.9

RINSES

H_2O: Final ____ g; Initial ____ g; Net ____ g

CH_2Cl_2: Final ____ g; Initial ____ g; Net ____ g + 1.32 g/ml = ____ ml DM

IMPINGERS

Run: 3 Sample Box: F

Filter Number: paper

	Impinger Number 1	2	3	4	5	6
Initial Volume of liquid (H_2O) in impingers, (ml)	100	100	–	S.G		
Final (g)	712.3	596.7	528.3	866.5		
Initial (g)	702.0	595.7	527.1	856.9		
Net (g)	10.3	1.0	1.2	9.6		

Initials: DK PRK

Total (g) 22.1

RINSES

H_2O: Final ____ g; Initial ____ g; Net ____ g

CH_2Cl_2: Final ____ g; Initial ____ g; Net ____ g + 1.32 g/ml = ____ ml DM

AGR_009805

Timpview Analytical Laboratories

1165 North 1600 West, Orem, Utah, 84057 (801) 229-2282

Certificate of Analysis

TETCO
Dean Kitchen
90 East Main
Lehi, UT 84043
Phone: 768-0973
Fax: 768-0880

Work Order #: 25288
Customer PO #:
Date / Time Received: 4/1/05 15:49
Date Reported: 4/15/05

Sample Name: Agrium PPA Run 1 **Lab ID:** D504-008
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.314	mg

Sample Name: Agrium PPA Run 2 **Lab ID:** D504-009
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.312	mg

Sample Name: Agrium PPA Run 3 **Lab ID:** D504-010
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.227	mg

Sample Name: Agrium Phosphoric Acid Run 1 **Lab ID:** D504-011
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.588	mg

Sample Name: Agrium Phosphoric Acid Run 2 **Lab ID:** D504-012
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.301	mg

Sample Name: Agrium Phosphoric Acid Run 3 **Lab ID:** D504-013
Date / Time Sampled: 3/30/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	0.293	mg

Sample Name: Agrium SPA Run 1 **Lab ID:** D504-014

Date / Time Sampled: 3/31/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	1.83	mg

Sample Name: Agrium SPA Run 2 **Lab ID:** D504-015

Date / Time Sampled: 3/31/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	5.14	mg

Sample Name: Agrium SPA Run 3 **Lab ID:** D504-016

Date / Time Sampled: 3/31/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	7.86	mg

Sample Name: Field Blank **Lab ID:** D504-017

Date / Time Sampled: 3/31/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	< 0.1	mg

Sample Name: Audit Fl-0508 **Lab ID:** D504-018

Date / Time Sampled: 3/31/05 0:00 **Sample Type (Matrix):** Liquid

Parameter	Analysis Method	Analysis Date	Result	Units
Fluoride	EPA 13B	4/15/05	5.92	mg

Comments:
No ash fusion or distillation performed prior to sample analysis.

Reviewed by: _____
Ryan Freeman, Manager / QA Officer

Dean Kitchen

From: "Ryan Freeman" <rfreeman@timpview.com>
To: <tetco@mindspring.com>
Sent: Tuesday, April 19, 2005 9:54 AM
Subject: FW: Fluoride Audit 4/15/05

-----Original Message-----
From: MICHAEL STAMBULIS [mailto:mstambul@deq.idaho.gov]
Sent: Tuesday, April 19, 2005 8:41 AM
To: rfreeman@timpview.com
Subject: Re: Fluoride Audit 4/15/05

Concentration Results

Compound	Measured Concentration	Pass/Fail
fluoride	5.92 mg	
PASS		

Audit Sampling Dates
Audit Starting Date: 04/15/2005
Audit Ending Date: 04/15/2005

Collection Firm
Collection Firm Name: TETCO
Street Address: 90 East Main
City: Lehi
State: UT
ZIP: 84043
Office Telephone No.: 801-768-0973

Analyzing Laboratory
Laboratory Name: Timpview Analytical Laboratori Street Address: 1165 N Geneva
City: Orem
State: Utah
ZIP: 84057
Telephone No.: 801-229-2282

Audit Test Site Information
Audit Site Name: J.R. Simplot
Street Address: 1150 W Highway 30
City: Pocatello
State: ID
ZIP: 83204

>>> "Ryan Freeman" <rfreeman@timpview.com> 04/15/05 04:53PM >>>
Fluoride Audit Sample # FI-0508

Result = 5.92 mg

Analysis Date = 4/15/05

Source = Agrium

Thanks,
Ryan Freeman
Timpview Analytical
(801) 229-2282

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TETCO Stack Emission Analysis
Accurate • Reliable • Qualified
90 East Main, Lehi, Utah 84043 • 801-768-0973 • FAX 801-768-0880

Chain of Custody

Sample Identification	Method of Analysis	Recovery Date	Sample Description
Agrium PPA Run 1	EPA Method 13 B	3/30/05	Impinger Catch & Rinse
Run 2	EPA Method 13 B		Impinger Catch & Rinse
Run 3	EPA Method 13 B		Impinger Catch & Rinse
Agrium Phosphoric Acid		3/30/05	
Run 1	EPA Method 13 B		Impinger Catch & Rinse (2 bottles)
Run 2	EPA Method 13 B		Impinger Catch & Rinse (2 bottles)
Run 3	EPA Method 13 B		Impinger Catch & Rinse (2 bottles)
Agrium SPA Run 1	EPA Method 13 B	3/31/05	Impinger Catch & Rinse
Run 2	EPA Method 13 B		Impinger Catch & Rinse
Run 3	EPA Method 13 B		Impinger Catch & Rinse
Field Blank	EPA Method 13B		Field Blank 55 mm filter

Sampled By: Paul R Kitchen Date(s): 3/30-31/05
Transported To: TETCO
Custodian: Paul R Kitchen Date: 3/31/05
Received By: Date:

Transported To:
Custodian: Date:
Received By: Date:

Transported To: Timp View
Custodian: Paul R Kitchen Date: 4/1/05
Received By: Joyce Applegate Date: 4-1-5

Unless otherwise indicated, all samples are transported to Timpview Analytical Laboratories (TAL). All samples are logged onto a TAL *Sample Submittal and Chain of Custody Form.*

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Chain of Custody

Sample Identification	Method of Analysis	Recovery Date	Sample Description
Audit Sample Fl-0508	EPA Method 13 B		EPA Audit Sample

Transported To: Timpview Analytical Laboratories
Custodian: Paul R. Kitchen 4-1-05
Received By: Joyce Applegate 4-1-05

Transported To:
Custodian:
Received By:

Transported To:
Custodian:
Received By:

Unless otherwise indicated, all samples are transported to Timpview Analytical Laboratories (TAL). All samples are logged onto a TAL *Sample Submittal and Chain of Custody Form.*

APPENDIX D

Summary Formats
- Phosphoric Acid
- Conditioning Vent Scrubber

AGR_009812

Summary Format for Fluoride Tests, Methods 1-4, 13B

Company Name: Agrium

Location (City): Soda Springs, Idaho

Source Sampled: Phosphoric Acid Plant Scrubber Exhaust

Description	units	Run #1	Run #2	Run #3
Sample Date:		3/30/05	3/30/05	3/30/05
Barometric Pressure:	(in Hg)	23.65	23.65	23.65
DGM Calibration Factor:	(Y)	1.004		
Pitot Calibration Factor	(Cp)	0.84		
	units	*Run #1*	*Run #2*	*Run #3*
Nozzle Diameter	(in)	0.2545	0.2545	0.2545
No. of Sample Ports	N / A	2		
No. Sample Points per Diameter	N / A	6		
	units	*Run #1*	*Run #2*	*Run #3*
Total Sampling Time	(min)	60	60	60
H_2O Collected in Implingers	(ml)	37.9	36.8	39.0
CO_2 (Ambient Air)	(%)	1.8	1.8	1.6
O_2 (Ambient Air)	(%)	20.2	20.4	20.8
Static Pressure	(in H_2O)	-0.21	-0.21	-0.21
Fluoride in Sample	(mg)	0.59	0.30	0.29

Summary Format for Fluoride Tests, Methods 1-4, 13B

Company Name: Agrium

Location (City): Soda Springs, Idaho

Source Sampled: Conditioning Vent Scrubber

Description	units	Run #1	Run #2	Run #3
Sample Date:		3/30/05	3/30/05	3/30/05
Barometric Pressure:	(in Hg)	23.77	23.77	23.77
DGM Calibration Factor:	(Y)	1.016		
Pitot Calibration Factor	(Cp)	0.84		
	units	*Run #1*	*Run #2*	*Run #3*
Nozzle Diameter	(in)	0.2220	0.2220	0.2220
No. of Sample Ports	N / A	2		
No. Sample Points per Diameter	N / A	6		
	units	*Run #1*	*Run #2*	*Run #3*
Total Sampling Time	(min)	60	60	60
H_2O Collected in Implingers	(ml)	20.5	16.9	22.1
CO_2 (Ambient Air)	(%)	0.0	0.0	0.0
O_2 (Ambient Air)	(%)	20.9	20.9	20.9
Static Pressure	(in H_2O)	-0.49	-0.49	-0.49
Fluoride in Sample	(mg)	0.31	0.31	0.23

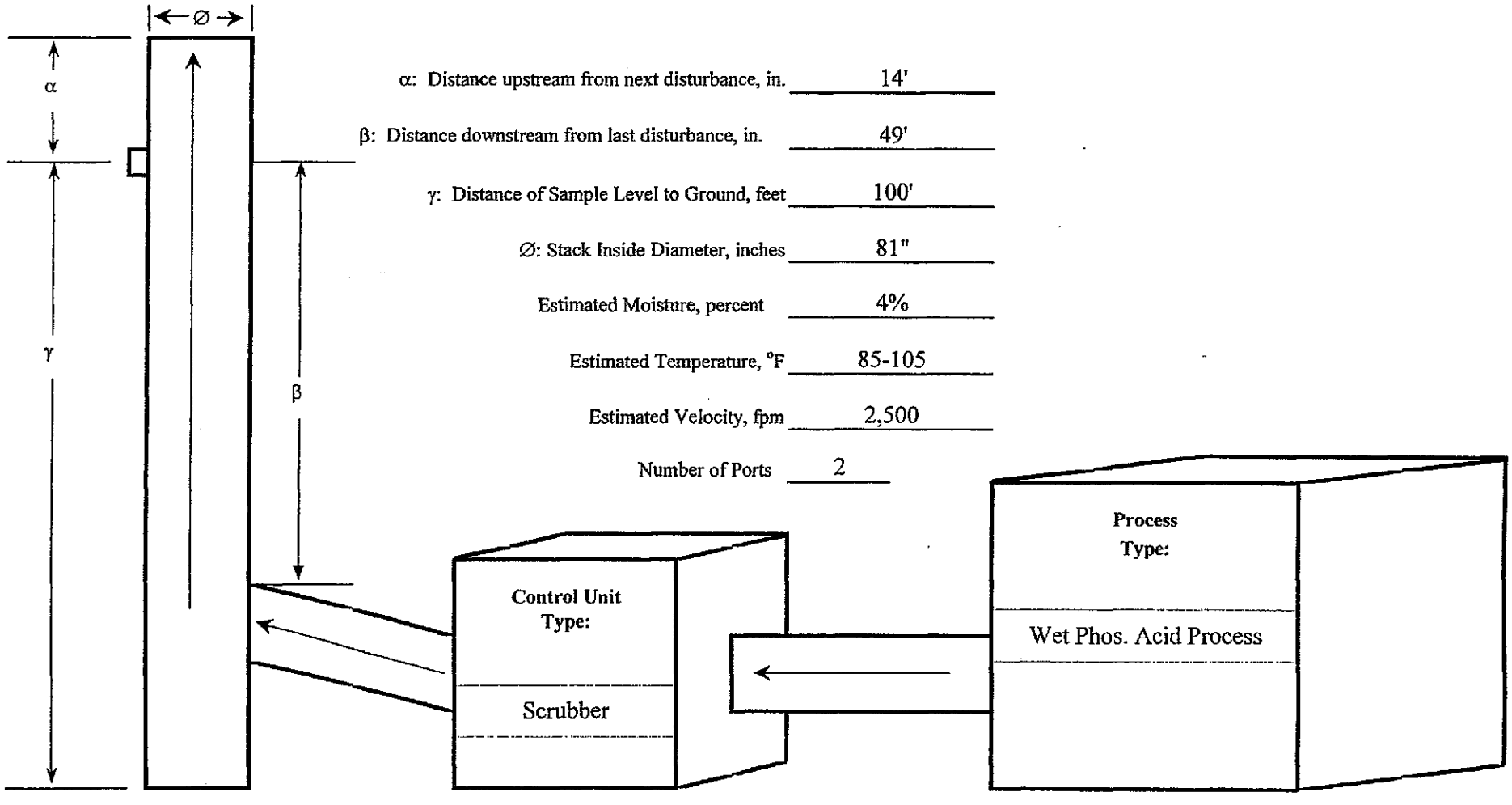
APPENDIX E

Figure 1. Facility Schematic Representation, Phosphoric Acid
Figure 2. Facility Schematic Representation, Conditioning Vent Scrubber
Raw Production Data (submitted by Agrium personnel)

AGR_009815

Facility: Agrium

Stack Identification: Phosphoric Acid Scrubber Exhaust

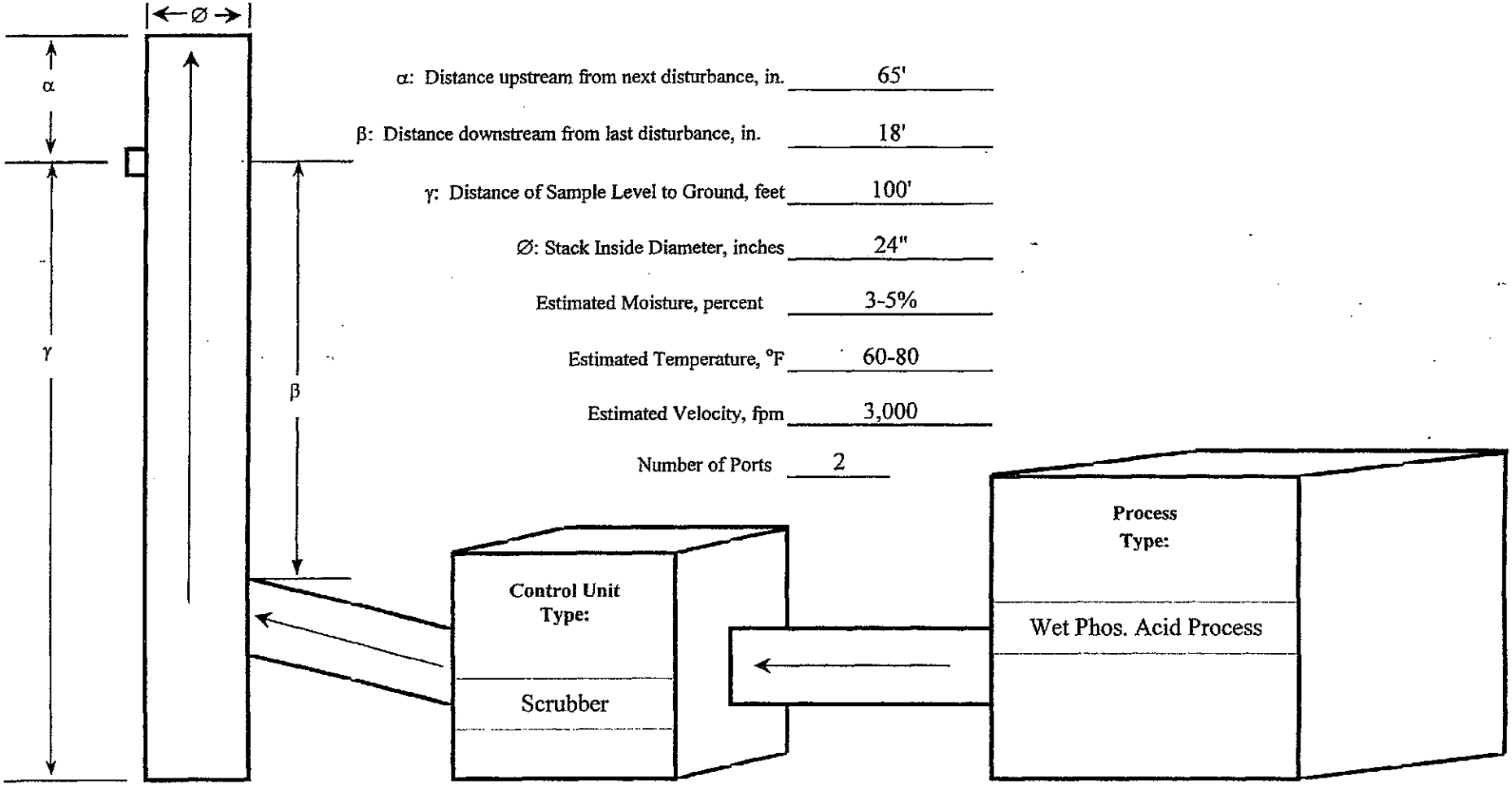


α: Distance upstream from next disturbance, in.	14'
β: Distance downstream from last disturbance, in.	49'
γ: Distance of Sample Level to Ground, feet	100'
Ø: Stack Inside Diameter, inches	81"
Estimated Moisture, percent	4%
Estimated Temperature, °F	85-105
Estimated Velocity, fpm	2,500
Number of Ports	2

Figure 1. Facility Schematic Representation

Facility: Agrium

Stack Identification: Conditioning Vent Scrubber



α: Distance upstream from next disturbance, in. 65'

β: Distance downstream from last disturbance, in. 18'

γ: Distance of Sample Level to Ground, feet 100'

Ø: Stack Inside Diameter, inches 24"

Estimated Moisture, percent 3-5%

Estimated Temperature, °F 60-80

Estimated Velocity, fpm 3,000

Number of Ports 2

Figure 1. Facility Schematic Representation

AGR_009817

APPENDIX F

Calibration of the console dry gas meter(s), pitot tubes, nozzles diameters, and temperature sensors were carried out in accordance with the procedures outlined in the Quality Assurance Handbook. The appropriate calibration data are presented in the following pages. The nozzle calibrations are recorded on the first page of the field data sheets.

Figure 3. Schematic of Method 13B Sampling Train
Meter Box Calibration Data and Calculations Forms
Post-test Dry Gas Meter Calibration Data Forms
Type S Pitot Tube Inspection Data (Pre- and Post- Test)
Sample Box Temperature Sensor Calibration

AGR_009818

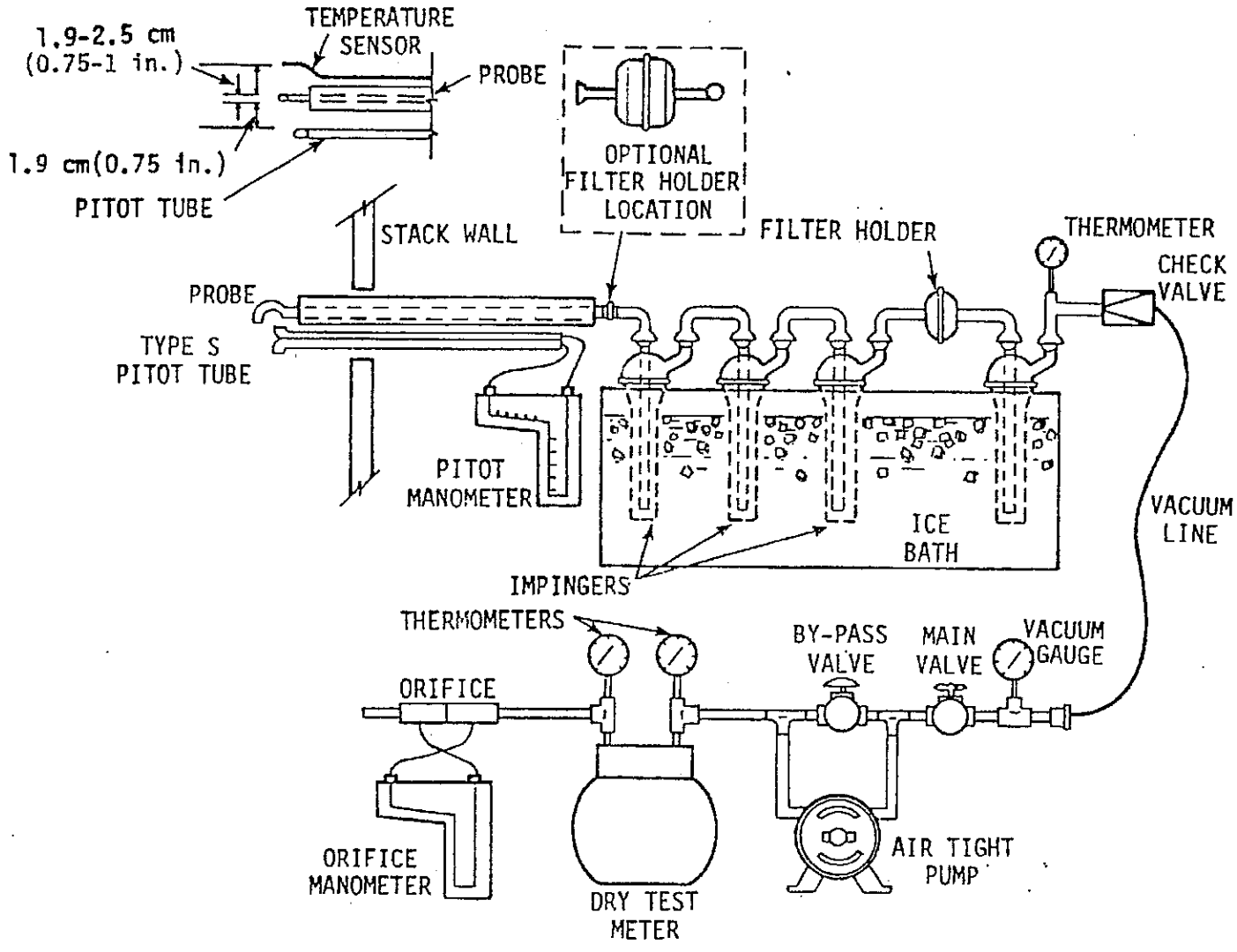


Figure 3. Schematic of Method 13B Sampling Train

Pretest--Console / Dry Gas Meter Calibration Sheet

Date: December 27, 2004 P_b: 25.43 Console #: 5 Vacuum: 5 Technician: Alex Moore

Line #	Meter Orifice Setting in. H_2O ΔH	Volume: Wet Test Meter ft^3 Vm_w	Volume: Dry Gas Meter ft^3 Vm_d	Temperature: Wet Test Meter: Measured °F T_w	Temperature: Wet Test Meter: Average °F Tw_{avg}	Temperature: Dry Gas Meter: Meter Inlet °F Tm_i	Temperature: Dry Gas Meter: Meter Outlet °F Tm_o	Temperature: Dry Gas Meter: Average °F Tm_{avg}	Time (mm ss ss) (mm mm) θ	$\Delta H_@$ in H_2O $\Delta H_@$	Y-Factor Dimensionless Y
1	.45	5.003	5.028	65 65 65	65.0	74 76 77	74 75 75	75.2	11.016	1.401	1.013
2	.85	5.004	5.018	65 65 65	65.0	78 80 81	76 77 77	78.2	8.177	1.449	1.020
3	1.45	5.008	5.012	65 65 65	65.0	81 81 83	77 77 77	79.3	6.420	1.518	1.022
4	2.05	5.028	5.003	65 65 65	65.0	73 74 76	73 73 74	73.8	5.454	1.553	1.016
5	2.65	5.026	5.009	65 65 65	65.0	74 77 78	73 73 74	74.8	4.844	1.581	1.014
6	3.25	5.023	5.006	65 65 65	65.0	72 75 76	73 73 73	73.7	4.398	1.604	1.011
									Average =>	1.518	1.016

Temperature Sensor Calibration

Reference:

	Temperature Source (Medium)	Temperature: Reference (°F)	Temperature: Sensor (°F)	Temperature Difference (°F)
Meter In Tm_i	Air	70	70	0
	Continuity			Pass
Meter Out Tm_o	Air	70	70	0
	Continuity			Pass

$$Y = \frac{Vm_w \cdot P_b \cdot (Tm_{avg} + 460)}{Vm_d \cdot [P_b + \Delta H / 13.6] \cdot (Tw_{avg} + 460)}$$

$$\Delta H_@ = \frac{0.0317 \cdot \Delta H}{P_b \cdot (Tm_{avg} + 460)} \cdot \left[\frac{\theta \cdot (Tw_{avg} + 460)}{Vm_w} \right]^2$$

AGR_009820

Pretest--Console / Dry Gas Meter Calibration Sheet

Date: December 27, 2004 P_b: 25.45 Console #: 6 Vacuum: 5 Technician: Alex Moore

Line #	Meter Orifice Setting in. H_2O ΔH	Volume: Wet Test Meter ft^3 Vm_w	Volume: Dry Gas Meter ft^3 Vm_d	Temperature: Wet Test Meter: Measured °F T_w	Temperature: Wet Test Meter: Average °F Tw_{avg}	Temperature: Dry Gas Meter: Meter Inlet °F Tm_i	Temperature: Dry Gas Meter: Meter Outlet °F Tm_o	Temperature: Dry Gas Meter: Average °F Tm_{avg}	Time (mm ss ss) (mm mm) θ	$\Delta H_@$ in H_2O $\Delta H_@$	Y-Factor Dimensionless Y
1	.45	5.004	5.013	65 65 65	65.0	76 78 81	71 72 74	75.3	11.601	1.551	1.017
2	.85	5.006	5.076	65 65 65	65.0	83 83 84	77 77 77	80.2	8.674	1.622	1.012
3	1.45	5.020	5.110	65 66 66	65.7	79 82 84	76 77 77	79.2	6.852	1.725	1.003
4	2.05	5.009	5.122	65 66 66	65.7	82 86 88	77 77 77	81.2	5.836	1.770	1.001
5	2.65	5.012	5.139	66 66 66	66.0	82 86 87	77 77 77	81.0	5.157	1.787	.995
6	3.25	5.011	5.041	65 65 65	65.0	71 76 78	67 68 68	71.3	4.674	1.827	.997
									Average =>	1.714	1.004

Temperature Sensor Calibration

Reference:

	Temperature Source (Medium)	Temperature: Reference (°F)	Temperature: Sensor (°F)	Temperature Difference (°F)
Meter In Tm_i	Air	75	75	0
	Continuity			Pass
Meter Out Tm_o	Air	75	75	0
	Continuity			Pass

$$Y = \frac{Vm_w \cdot P_b \cdot (Tm_{avg} + 460)}{Vm_d \cdot [P_b + \Delta H / 13.6] \cdot (Tw_{avg} + 460)}$$

$$\Delta H_@ = \frac{0.0317 \cdot \Delta H}{P_b \cdot (Tm_{avg} + 460)} \cdot \left[\frac{\theta \cdot (Tw_{avg} + 460)}{Vm_w} \right]^2$$

AGR_009821

Post Test – Console / Dry Gas Meter Calibration Sheet

Facility SPA & PPA

Date 4/4/05 P_b 25.24 Console # 5 Technician [illegible]

Line #	Meter Orifice Setting in H_20	Volume		Temperature					Time	Vacuum	Y- Factor
				Wet Test Meter		Dry Gas Meter					
		Wet Test Meter ft^3	Dry Gas Meter ft^3	Measured °F	Average °F	Meter Inlet °F	Meter Outlet °F	Average °F		in Hg	Dimensionless
	ΔH	Vm_w	Vm_d	T_w	Tw_{avg}	Tm_i	Tm_o	Tm_{avg}	θ	P_{vac}	Y
1	1.67	5.005	5.217	65 65 65	65	91 92 92	80 81 81	86.2	6:08	6	.993
2	1.67	5.006	5.228	65 65 65	65	92 90 90	81 81 81	85.8	6:08	6	.991
3	1.67	5.005	5.217	65 65 65	65	90 89 90	81 81 81	85.3	6:08	6	.992
4											
5											
6											
										Average ⇒	.992

$$Y = \frac{Vm_w \bullet P_b \bullet (Tm_{avg} + 460)}{Vm_d \bullet [P_b + \Delta H / 13.6] \bullet (Tw_{avg} + 460}$$

Pre test Y Factor 1.016

AGR_009822

Post Test – Console / Dry Gas Meter Calibration Sheet

Facility Phos

Date 4/4/05 P_b 25.24 Console # 6 Technician [illegible]

Line #	Meter Orifice Setting in H_2O	Volume		Temperature					Time	Vacuum	Y- Factor
				Wet Test Meter		Dry Gas Meter					
		Wet Test Meter ft^3	Dry Gas Meter ft^3	Measured °F	Average °F	Meter Inlet °F	Meter Outlet °F	Average °F			Dimensionless
	ΔH	Vm_w	Vm_d	T_w	Tw_{avg}	Tm_i	Tm_o	Tm_{avg}	θ	P_{vac}	Y
1	1.72	5.007	5.165	65 65 65	65	84 86 87	66 68 69	71.7	6:29	6	.977
2	1.72	5.066	5.217	65 65 65	65	86 87 87	71 69 73	78.83	6:30	6	.980
3	1.72	5.004	5.261	65 65 65	65	86 87 89	73 75 77	81.2	6:31	6	.976
4											
5											
6											
										Average ⇒	.978

$$Y = \frac{Vm_w \bullet P_b \bullet (Tm_{avg} + 460)}{Vm_d \bullet [P_b + \Delta H / 13.6] \bullet (Tw_{avg} + 460}$$

Pre test Y Factor 1.004

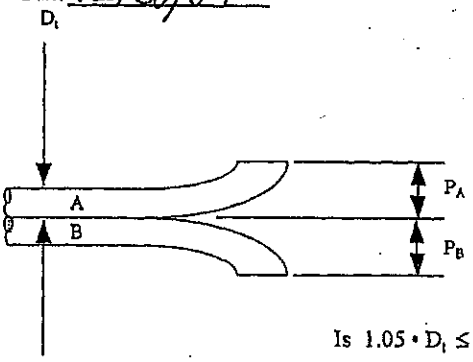
AGR_009823

Type S Pitot Tube Inspection Data

Date: 12/28/04

Pitot Tube Identification: 41

Technician: Mike Ranson



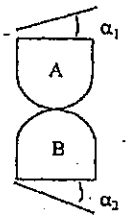
D_t = .250 in.

P_A = .321 in.

P_B = .321 in.

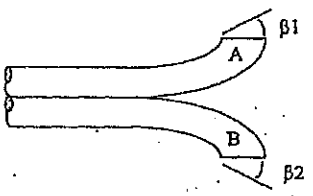
Is $P_A = P_B$? ✓

Is $1.05 \cdot D_t \le D_t \le 1.50 \cdot D_t$? ✓



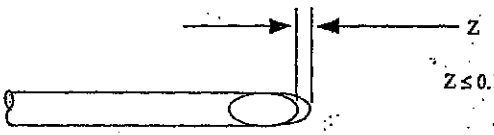
$\alpha_1 < 10°$ α_1 = 1 °

$\alpha_2 < 10°$ α_2 = 1 °

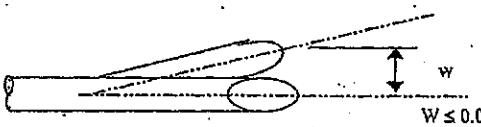


$\beta_1 < 5°$ β_1 = 0 °

$\beta_2 < 5°$ β_2 = 3 °



$Z \le 0.125$ in. Z = .065 in.



$W \le 0.03125$ in. W = .013 in.

The pitot tube meets the specifications for a calibration factor of 0.84? ✓

Temperature Sensor Calibration

Reference:

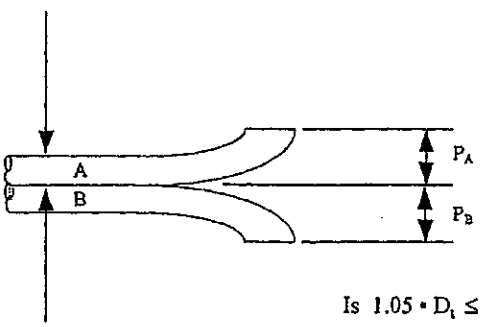
	Temperature Source (Medium)	Temperature Reference (°F)	Temperature Sensor (°F)	Temperature Difference (°F)
Probe	Air	67	69	3
	Continuity	Check	—	✓
Stack	Air	68	69	1
	Continuity	Check	—	✓

Type S Pitot Tube Inspection Data

Date: 12/23/2004

Pitot Tube Identification: 84-G

Technician: Brendan Gess / Mike Ransom



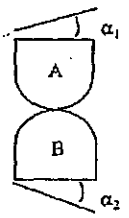
D_t = .375 in.

P_A = .516 in.

P_B = .516 in.

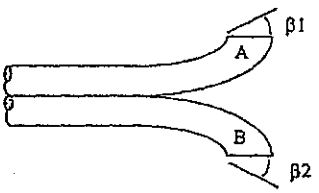
Is $P_A = P_B$? ✓

Is $1.05 \cdot D_t \le D_t \le 1.50 \cdot D_t$? ✓



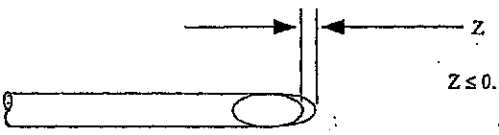
$\alpha_1 < 10°$ α_1 = 2 °

$\alpha_2 < 10°$ α_2 = 1 °

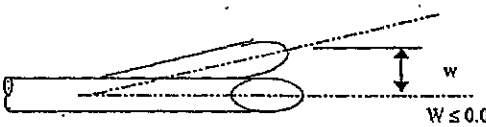


$\beta_1 < 5°$ β_1 = 3 °

$\beta_2 < 5°$ β_2 = 2 °



$Z \le 0.125$ in. Z = .031 in.



$W \le 0.03125$ in. W = .025 in.

The pitot tube meets the specifications for a calibration factor of 0.84? ✓

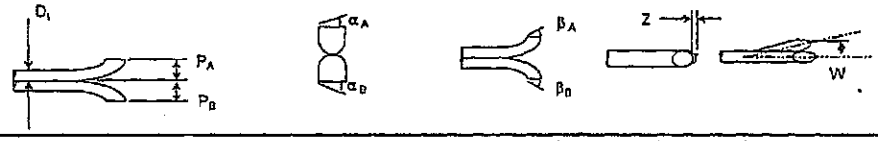
Temperature Sensor Calibration

Reference:

	Temperature Source (Medium)	Temperature Reference (°F)	Temperature Sensor (°F)	Temperature Difference (°F)
Probe	Air	68	68	0
	Continuity	check		✓
Stack	Air	68	69	1
	Continuity	check		✓

AGR_009825

Pitot Tube Dia (D_t): .250



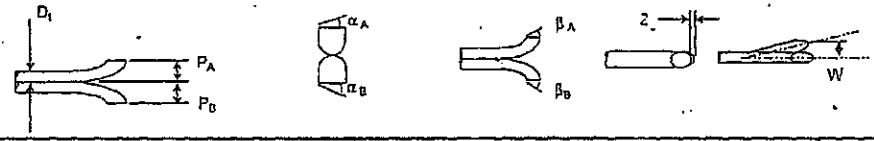
Continuity check: Cause a change in the thermocouple reading—by applying heat or ice to the sensor. Did the temperature reading fluctuate appropriately?

Date	Initial	P_A	P_B	$P_A = P_B$	α_A	α_B	β_A	β_B	Z	W	Meet 0.84 C_p Specs?	T_S Stack	T_R Reference	ΔT	Temp. Accuracy	Continuity Check	Action / Comments
		$1.05 \cdot D_t < P_A < 1.50 \cdot D_t$		—	< 10°	< 10°	< 5°	< 5°	$Z \le 0.125$	$W \le 0.03125$				± 2°			
		inches	inches	Y / N	degrees	degrees	degrees	degrees	inches	inches	Y / N	°F	°F	°F	P / F	P / F	
01/09/01	MR	.318	.318	Y	1	1	1	3	.045	.006	Y	74	75	1	P	P	
7/20/04	BG	.318	.318	Y	1	1	1	3	.045	.006	Y	86	84	2	P	P	
8/13/04	BG	.317	.317	Y	1	1	2	2	.069	.015	Y	86	85	1	P	P	
9/13/04	BG	.315	.315	Y	1	2	3	2	.067	.015	Y	78	78	0	P	P	
2/05/05	BG	.314	.314	Y	2	2	3	2	.063	.014	Y	70	69	1	P	P	
2/10/05	BG	.316	.316	Y	2	3	3	2	.065	.016	Y	68	67	1	P	P	
3/25/05	MR	.314	.314	Y	2	3	3	1	.067	.014	Y	68	69	1	P	P	
4/19/2005	BG	.317	.317	Y	2	1	2	1	.066	.014	Y	67	66	1	P	P	

Page _____ of _____

AGR_009826

Pitot Tube Dia (D_t): .375



Continuity check: Cause a change in the thermocouple reading—by applying heat or ice to the sensor. Did the temperature reading fluctuate appropriately?

Date	Initial	P_A (1.05 < D_t < P_A < 1.50 × D_t) inches	P_B inches	$P_A = P_B$ Y / N	α_A < 10° degrees	α_B < 10° degrees	β_A < 5° degrees	β_B < 5° degrees	Z (Z ≤ 0.125) inches	W (W ≤ 0.03125) inches	Meet 0.84 C_p Specs? Y / N	T_S Stack °F	T_R Reference °F	ΔT ± 2° °F	Temp. Accuracy P / F	Continuity Check P / F	Action / Comments
08/09/04	MR	.519	.519	Y	1	2	2	1	.031	.022	Y	77	76	1	P	P	
08/13/04		.519	.519	Y	1	2	2	1	.033	.022	Y	86	84	2	P	P	
9/13/04	[illegible]	.520	.520	Y	2	1	2	1	.033	.021	Y	80	79	1	P	P	
10/15/04	DMK	.521	.521	Y	0	1	1	2	0.054	.027	Y	72	72	0	P	P	
11/4/04	DMK	.520	.520	Y	1	1	1	2	0.027	.018	Y	68	67	1	P	P	
11/16/04	[illegible]	.521	.521	Y	1	2	1	1	.025	.018	Y	70	70	0	P	P	
3/11/05	[illegible]	.519	.519	Y	1	2	1	1	.026	.019	Y	71	69	2	P	P	
3/18/05	[illegible]	.520	.520	Y	2	2	2	0	.026	.021	Y	69	68	1	P	P	
4/6/05	[illegible]	.520	.520	Y	2	2	2	0	.025	.021	Y	69	68	1	P	P	
4/18/05	[illegible]	.521	.521	Y	2	2	2	0	.025	.021	Y	71	71	0	P	P	

Page _____ of _____

Pitot ID: 84-G

AGR_009827

TETCO

Sample Box Temperature Sensor Calibration

Date: 1/4/05 Calibrator: Doug Olson / Brendon Geoss Reference: NIST Tm

Unit ID	Thermocouple Location	Temperature Source (Medium)	Temperature Reference (°F)	Temperature Sensor (°F)	Temp. Diff. or Result (°F), P/F
A	Oven 4	Air	66	65	1
		Continuity	—	Increased	P
	Probe Out 3	Air	67	67	1
		Continuity	—	Increased	P
	Impinger Out 5	Air	70	69	1
		Continuity	—	Increased	P
B	Oven	Air	73	73	0
		Continuity	—	Increased	P
	Probe Out	Air	66	67	1
		Continuity	—	Increased	P
	Impinger Out	Air	68	67	1
		Continuity	—	Increased	P
C	Oven	Air	69	70	1
		Continuity	—	Increased	P
	Probe Out	Air	67	68	1
		Continuity	—	Increased	P
	Impinger Out	Air	62	61	1
		Continuity	—	Increased	
D	Oven	Air	68	68	0
		Continuity	—	Increased	P
	Probe Out	Air	67	68	1
		Continuity	—	Increased	P
	Impinger Out	Air	66	65	1
		Continuity	—	Increased	P
E	Oven	Air	66	67	1
		Continuity	—	Increased	P
	Probe Out	Air	66	67	1
		Continuity	—	Increased	P
	Impinger Out	Air	66	65	1
		Continuity	~~66~~ OK	~~65~~ Increased	P
F	Oven	Air	68	68	1
		Continuity	—	Increased	P
	Probe Out	Air	68	67	1
		Continuity	—	Increased	P
	Impinger Out	Air	63	61	2
		Continuity	—	Increased	P
	Impinger Out G	Air	64	63	1
		Continuity	—	Increased	P
	Impinger Out H	Air	64	64	0
		Continuity	—	Increased	P

APPENDIX G

Test was conducted according to the protocol followed for the 2004 testing project.