Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

10-EMD-0036

FEB 17 2010

Mr. Davis Zhen
Office of Air Quality
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, AWT-107
Seattle, Washington 98101

Dear Mr. Zhen:

TRANSMITTAL OF THE CALENDAR YEAR 2009 QUARTERLY TRAVERSE MEASUREMENTS FOR EMISSION UNIT EP-325-01-S, RADIOCHEMICAL PROCESSING LABORATORY, 325 BUILDING, HANFORD SITE

The purpose of this letter is to submit annual stack measurement data as requested in the U.S. Environmental Protection Agency letter to K. A. Klein, U.S. Department of Energy Richland Operations Office, from J. Ken Knight, "Request for Alternate Method for Stack Flow Measurement at the Radiochemical Processing Laboratory (RPL) Emission Unit EP-325-01-S," dated May 11, 2004. Attached are the Calendar Year 2009 quarterly stack traverse reports for the RPL. Each of the traverse reports indicate the flow rate out of the stack is within normal operating parameters as shown in Table 1 below.

Table 1. 2009 Traverse Data for the RPL, Stack EP-325-01-S

Traverse point	Date	Flow Rate* (cfm)	Expected Range (cfm)
TP-325-01-1	03/03/2009 2:30 PM	137,600	129,000 – 145,000
	05/20/2009 2:00 PM	142,300	
	08/31/2009 2:00 PM	141,300	
	11/24/2009 11:30 AM	140,300	

*Flow rate in cubic feet per minute as measured by Pacific Northwest National (PNNL) Laboratory Effluent Management procedure EMS-AIR-016, PNNL Stack/Duct Velocity Traverse Method. This procedure is commensurate with 40 CFR 60, Appendix A, Methods 1 and 2.

FEB 17 2010

If you have any questions, please contact Stephen R. Weil, Director, Environmental Management Division on (509) 372-0879.

Sincerely,

Ray J. Corey, Assistant Manager
for Safety and Environment

EMD: MFJ

Attachment

cc w/attach:
R. H. Anderson, MSA
J. M. Barnett, PNNL
P. J. Martell, WDOH
O. S. Wang, Ecology
Administrative Record: 325 Building
Environmental Portal, LMSI

Attachment A

325 Building 2009 Quarterly Traverse Reports

RT A

Traverse Performed: Date: 3/3/2009 Time: 2:30 P.M.

Normal Operating Condition [signature] 3/4/09 Building Engineer Signature/Date

Test Personnel: Blaylock and Martin,Tolrud

Pitot Tube Type: Standard ID No.: Item # 73 Expires 02/10

Manometer Type: 1" Oil Code No.: Item#7 Cal. Exp. Date: 09/2009

Temp. Probe Type: Thermocouple Code No.: Item # 122 Cal. Exp. Date: 06/2009

PART B

Traverse Point No.	Distance From Port Entrance (inches)*	Port A			Port B		
		V_{pt} ("H^2O)	$\sqrt{V_{pt}}$	T_s (°F)	V_{pt} ("H^2O)	$\sqrt{V_{pt}}$	T_s (°F)
1	2.5	0.380	0.616	78.0	0.420	0.648	78.0
2	7.9	0.400	0.632	78.0	0.520	0.721	78.0
3	14.0	0.440	0.663	78.0	0.530	0.728	78.0
4	21.7	0.440	0.663	78.0	0.520	0.721	78.0
5	32.8	0.450	0.671	78.0	0.500	0.707	78.0
6	63.2	0.460	0.678	78.0	0.490	0.700	78.0
7	74.3	0.450	0.671	78.0	0.480	0.693	78.0
8	82.0	0.450	0.671	78.0	0.470	0.686	78.0
9	88.1	0.450	0.671	78.0	0.460	0.678	78.0
10	93.5	0.440	0.663	78.0	0.420	0.648	78.0
Static Pressure	0.020	Ave. $\sqrt{V_{pt}}$=	0.660		Ave. $\sqrt{V_{pt}}$=	0.693	
Barometric Pressure	29.29	T_R=Ave. T_s + 460=		538	T_R=Ave. T_s + 460=		538
Calculated Absolute Pressure =	29.29	$V_{port}A$=	2,670	ft/min	$V_{port}A$=	2,800	ft/min
Duct Area:	50.3 sq ft	Volumetric Flow Rate (Q)= ([$V_{port}A$+$V_{port}B$]/2)*A_s=				137,600 cfm	
Traverse Path Length:	96.0 inches						

***Be sure to include distance from port entrance to inside wall.**

C_p = Pitot tube coefficient =0.99 (Std Probe); Cp=0.84 (Type-S)
V_{pt} = Velocity pressure at traverse point ($^{\circ}H_2O$)
Ave. $\sqrt{V_{pt}}$ = Ave. square root of the velocity pressure at a traverse point
P_{abs} = Absolute stack pressure ($^{\circ}Hg$) = $P_{stack}/13.6 + P_b$
T_s = Stack gas temperature (°F)
T_R = Stack gas temp (°R) = T_s + 460
Vport=952*Cp*(Ave.√Vpt)*√(TR/Pabs)
A_s = Area of stack at sample location (sq.ft.)
Q = Average stack volumetric flow rate (cfm) = (Ave. Vport) * As

PART C

Leak Test: Pass: X Fail: ____

Plug Test Results: VP: before back-purge: 0.52 after back-purge: 0.52

VP (after)/ VP (before) = 1.00 >1.05 test failed - perform again

Comments: (If more space is needed, use the back of this page)

Form Completed by: Loretta Stuckey Date: 03-03-09

Verified by: Bob Blanlock Date: 3/3/09

Effluent Management: Betty S. Anderson Date: 3/4/09

PART A

Traverse Performed: Date: 5/20/2009 Time: 2:00P.M.

Normal Operating Condition [signature] 5/21/05 Building Engineer Signature/Date

Test Personnel: Bob Blaylock and Craig Redinger

Pitot Tube Type: Standard ID No.: Item # 73 Expires 02/10

Manometer Type: 1" Oil Code No.: Item#7 Cal. Exp. Date: 09/2009

Temp. Probe Type: Thermocouple Code No.: Item # 122 Cal. Exp. Date: 06/2009

PART B

Traverse Point No.	Distance From Port Entrance (inches)*	Port A			Port B		
		V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)	V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)
1	2.5	0.400	0.632	81.0	0.500	0.707	81.0
2	7.9	0.460	0.678	81.0	0.560	0.748	81.0
3	14.0	0.470	0.686	81.0	0.550	0.742	81.0
4	21.7	0.480	0.693	81.0	0.560	0.748	81.0
5	32.8	0.480	0.693	81.0	0.520	0.721	81.0
6	63.2	0.480	0.693	81.0	0.510	0.714	81.0
7	74.3	0.480	0.693	81.0	0.510	0.714	81.0
8	82.0	0.500	0.707	81.0	0.500	0.707	81.0
9	88.1	0.500	0.707	81.0	0.500	0.707	81.0
10	93.5	0.500	0.707	81.0	0.450	0.671	81.0
Static Pressure	0.050	Ave. $\sqrt{V_{pt}}$=	0.689		Ave. $\sqrt{V_{pt}}$=	0.718	
Barometric Pressure	29.73	T_R=Ave. T_s + 460=		541	T_R=Ave. T_s + 460=		541
Calculated Absolute Pressure =	29.73	V_{port}A=	2,770	ft/min	V_{port}A=	2,890	ft/min
Duct Area:	50.3 sq ft	Volumetric Flow Rate (Q)= ([V_{port}A+V_{port}B]/2)*A_s=				142,300 cfm	
Traverse Path Length:	96.0 inches						

***Be sure to include distance from port entrance to inside wall.**

C_p = Pitot tube coefficient =0.99 (Std Probe); Cp=0.84 (Type-S)
V_{pt} = Velocity pressure at traverse point ("$H_2$0)
Ave.$\sqrt{V_{pt}}$ = Ave. square root of the velocity pressure at a traverse point
P_{abs} = Absolute stack pressure ("Hg) = P_{stack}/13.6 + P_b
T_s = Stack gas temperature (°F)
T_R = Stack gas temp (°R) = T_s + 460
Vport=952*Cp*(Ave.√Vpt)*√(TR/Pabs)
A_s = Area of stack at sample location (sq.ft.)
Q = Average stack volumetric flow rate (cfm) = (Ave. Vport) * As

PART C

Leak Test: Pass: X Fail: ____

Plug Test Results: VP: before back-purge: 0.50 after back-purge: 0.50

VP (after)/ VP (before) = 1.00 >1.05 test failed - perform again

Comments: (If more space is needed, use the back of this page)

Form Completed by: Loretta Shockey Date: 05-20-09

Verified by: Stacy Sattlie Date: 5-20-09

Effluent Management: Betty D. Anderson Date: 5/20-09

Stack Velocity Traverse Data
TP-325-01-1

PART A

Traverse Performed: Date: 8/31/2009 Time: 2:00PM

Normal Operating Condition [signature] 9/1/09 Building Engineer Signature/Date

Test Personnel: Blaylock and Buchanan

Pitot Tube Type: Standard ID No.: Item # 73 Expires 02/10

Manometer Type: 1" Oil Code No.: Item#7 Cal. Exp. Date: 09/2009

Temp. Probe Type: Airdata multi-meter Code No.: Item # 129 Cal. Exp. Date: 10/2009

PART B

Traverse Point No.	Distance From Port Entrance (inches)*	Port A			Port B		
		V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)	V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)
1	2.5	0.400	0.632	79.0	0.400	0.632	79.0
2	7.9	0.460	0.678	79.0	0.480	0.693	79.0
3	14.0	0.460	0.678	79.0	0.500	0.707	79.0
4	21.7	0.450	0.671	79.0	0.520	0.721	79.0
5	32.8	0.480	0.693	79.0	0.520	0.721	79.0
6	63.2	0.490	0.700	79.0	0.520	0.721	79.0
7	74.3	0.500	0.707	79.0	0.510	0.714	79.0
8	82.0	0.480	0.693	79.0	0.520	0.721	79.0
9	88.1	0.460	0.678	79.0	0.520	0.721	79.0
10	93.5	0.430	0.656	79.0	0.450	0.671	79.0
Static Pressure	0.000	Ave. $\sqrt{V_{pt}}$=	0.679		Ave. $\sqrt{V_{pt}}$=	0.702	
Barometric Pressure	29.29	T_R=Ave. T_s + 460=		539	T_R=Ave. T_s + 460=		539
Calculated Absolute Pressure =	29.29	V_{port}A=	2,740	ft/min	V_{port}A=	2,840	ft/min
Duct Area:	50.3 sq ft	Volumetric Flow Rate (Q)= ([V_{port}A+V_{port}B]/2)*A_s=				140,300 cfm	
Traverse Path Length:	96.0 inches						

***Be sure to include distance from port entrance to inside wall.**

C_p = Pitot tube coefficient =0.99 (Std Probe); Cp=0.84 (Type-S)
V_{pt} = Velocity pressure at traverse point ("$H_2$0)
Ave.$\sqrt{V_{pt}}$ = Ave. square root of the velocity pressure at a traverse point
P_{abs} = Absolute stack pressure ("Hg) = P_{stack}/13.6 + P_b
T_s = Stack gas temperature (°F)
T_R = Stack gas temp (°R) = T_s + 460
Vport=952*Cp*(Ave.√Vpt)*√(TR/Pabs)
A_s = Area of stack at sample location (sq.ft.)
Q = Average stack volumetric flow rate (cfm) = (Ave. Vport) * As

PART C

Leak Test: Pass: X Fail: ____

Plug Test Results: VP: before back-purge: 0.46 after back-purge: 0.46

VP (after)/ VP (before) = 1.00 >1.05 test failed - perform again

Comments: (If more space is needed, use the back of this page)

Form Completed by: Loretta Shakey Date: 08-31-09

Verified by: Bob Blanchard Date: 8/31/09

Effluent Management: Betty B. Anderson Date: 9/1/09

PART A

Traverse Performed: Date: 11/24/2009 Time: 11:30 AM

Normal Operating Condition [illegible] 11/30/09 Building Engineer Signature/Date

Test Personnel: Bob Blaylock, Larry Martin and Randy Tolrud

Pitot Tube Type: **Standard** ID No.: item # 73 expires 2/10

Manometer Type: **1" Oil** Code No.: item # 9 Cal. Exp. Date: 01/2010

Temp. Probe Type: **Digital thermo** Code No.: item # 122 Cal. Exp. Date: 07/2010

PART B

Traverse Point No.	Distance From Port Entrance (inches)*	Port A			Port B		
		V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)	V_{pt} ("$H^2$0)	$\sqrt{V_{pt}}$	T_s (°F)
1	2.5	0.450	0.671	73.0	0.420	0.648	73.0
2	7.9	0.480	0.693	73.0	0.500	0.707	73.0
3	14.0	0.490	0.700	73.0	0.520	0.721	73.0
4	21.7	0.480	0.693	73.0	0.520	0.721	73.0
5	32.8	0.500	0.707	73.0	0.510	0.714	73.0
6	63.2	0.500	0.707	73.0	0.530	0.728	73.0
7	74.3	0.490	0.700	73.0	0.530	0.728	73.0
8	82.0	0.500	0.707	73.0	0.520	0.721	73.0
9	88.1	0.500	0.707	73.0	0.500	0.707	73.0
10	93.5	0.450	0.671	73.0	0.450	0.671	73.0
Static Pressure	-0.020	Ave. $\sqrt{V_{pt}}$=	0.696		Ave. $\sqrt{V_{pt}}$=	0.707	
Barometric Pressure	29.90	T_R=Ave. T_s + 460=		533	T_R=Ave. T_s + 460=		533
Calculated Absolute Pressure =	29.90	V_{port}A=	2,770	ft/min	V_{port}A=	2,810	ft/min
Duct Area:	50.3 sq ft	Volumetric Flow Rate (Q)= ([V_{port}A+V_{port}B]/2)*A_s=				140,300 cfm	
Traverse Path Length:	96.0 inches						

***Be sure to include distance from port entrance to inside wall.**

C_p = Pitot tube coefficient =0.99 (Std Probe); Cp=0.84 (Type-S)
V_{pt} = Velocity pressure at traverse point ("$H_2$0)
Ave. $\sqrt{V_{pt}}$ = Ave. square root of the velocity pressure at a traverse point
P_{abs} = Absolute stack pressure ("Hg) = P_{stack}/13.6 + P_b
T_s = Stack gas temperature (°F)
T_R = Stack gas temp (°R) = T_s + 460
Vport=952*Cp*(Ave.√Vpt)*√(TR/Pabs)
A_s = Area of stack at sample location (sq.ft.)
Q = Average stack volumetric flow rate (cfm) = (Ave. Vport) * As

PART C

Leak Test: Pass: X Fail: ____

Plug Test Results: VP: before back-purge: 0.53 after back-purge: 0.53

VP (after)/ VP (before) = 1.00 >1.05 test failed perform again

Comments: (If more space is needed, use the back of this page)

Form Completed by: Bob [illegible] Date: 11/30/09

Verified by: Loretta Stokley Date: 11/30/09

Effluent Management: Betty S. Anderson Date: 11/30/09