pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

42-045-00070
PA000293037

MEMO

TO Heather Henry
Air Quality Program
Southeast Regional Office

FROM William Schneider RSS for WS
Source Testing Section

THROUGH Charles J. Zadakis CJZ
Environmental Program Manager
Division of Source Testing and Monitoring

Rick Szekeres RSS
Environmental Group Manager
Source Testing Section

DATE June 21, 2016

RE Source Test Review
Monroe Energy, LLC
Boiler No. 9 (Source ID 034) with control by LNB and FGR (C07), SCR (C08) and CO Catalyst (C09)
Boiler No. 10 (Source ID 035) with control by LNB and FGR (C10), SCR (C11) and CO Catalyst (C12)
Trainer Borough, Delaware County
Title V Operating Permit No. 23-00003
eFACTS: 2349862 PFID: 293037
eFACTS Inspection Result: NOVIO

MESSAGE:

Monroe Energy operates Boilers Nos. 9 and 10 at its refinery. These B&W boilers, rated at 349 MMBtu/hr, can be fired with natural gas or refinery fuel gas (RFG) and are used to generate steam. Nitrogen oxides (NO_X) emissions are controlled by low NO_X burners (LNB), flue gas recirculation (FGR) and Selective Catalytic Reduction (SCR). Carbon monoxide (CO) and volatile organic compound (VOC) emissions are controlled by CO catalyst. Exhaust emissions from these boilers exit through separate outlet stacks.

Per TVOP No. 23-00003, ARI Environmental conducted source testing during November 17-21, 2014 at the outlet stack of each of these two boilers for filterable and condensable particulate matter (FPM; EPA Method 5 and CPM; Method 202), filterable and condensable PM-10 and PM-2.5 (EPA Methods 201A and 202), non-methane hydrocarbons (NMHC; EPA Methods 25A/18) and ammonia (NH_3; CTM-027).

Boiler 9 PM Outlet Emissions
Test Run Nos. and Times

Parameter	B9-5-1 11/17/14 1448-1653	B9-5-2 11/18/14 0840-1055	B9-5-3 11/18/14 1159-1403	Average	Allowable
O_2 (%)	3.72	3.93	3.62	3.76	
FPM (EPA M5)					
gr/dscf	0.00079	0.00042	0.00011	0.00044	
lb/hr	0.43	0.23	0.06	0.24	
lb/MMBtu (F-factor)	0.0012	0.0006	0.0002	0.0007	≤0.03
lb/MMBtu (heat input)	0.0014	0.0007	0.0002	0.0008	≤0.03
CPM (EPA M202)					
gr/dscf	0.00383	0.00164	0.00188	0.00245	
lb/hr	2.07	0.89	1.01	1.32	
Total PM (M5 + M202)					
gr/dscf	0.0046	0.0021	0.0020	0.0029	
lb/hr	2.50	1.12	1.07	1.56	
lb/MMBtu (F-factor)	0.0068	0.0031	0.0029	0.0043	≤3.13
lb/MMBtu (heat input)	0.0079	0.0035	0.0033	0.0049	

Review discussion in comment no. 1 (p. 2) of this memo, regarding the use of these results. The 0.03 lb/MMBtu FPM allowable was at one time an allowable listed in the permit for this source, but is no longer a current permit allowable.

Boiler 9 PM-10 and PM-2.5 Outlet Emissions
Test Run Nos. and Times

Parameter	B9-PM10-1 11/18/14 1552-1729	B9-PM10-2 11/19/14 0849-1058	B9-PM10-3 11/19/14 1151-1359	Average	Allowable
O_2 (%)	4.3	3.9	3.8	4.0	
>PM-10					
gr/dscf	0.198E-03	0.167E-03	0.173E-03	0.179E-03	
lb/hr	0.109	0.091	0.094	0.098	
Total PM-2.5 (M201A + M202)					
gr/dscf	2.94E-03	2.05E-03	2.61E-03	2.53E-03	
lb/hr	1.63	1.12	1.43	1.39	≤3.13
Total PM-10 (M201A + M202)					
gr/dscf	3.38E-03	2.47E-03	2.80E-03	2.89E-03	
lb/hr	1.87	1.36	1.53	1.59	≤3.13

For a break-down in the above table by filterable and condensable PM-10 and PM-2.5, see the test report. The test report lists 1.75 lb/hr for the Boiler 9 PM-10 and PM-2.5 allowables, but my review of

Boiler 10 PM Outlet Emissions

Parameter	Test Run Nos. and Times B10-5-1 11/20/14 0819-1026	B10-5-2 11/20/14 1120-1341	B10-5-3 11/20/14 1422-1630	Average	Allowable
O_2 (%)	3.68	3.15	3.50	3.44	
FPM (EPA M5)					
gr/dscf	0.00026	0.00029	0.00018	0.00024	
lb/hr	0.14	0.15	0.09	0.13	
lb/MMBtu (F-factor)	0.0004	0.0004	0.0003	0.0004	≤0.03
lb/MMBtu (heat input)	0.0004	0.0005	0.0003	0.0004	≤0.03
CPM (EPA M202)					
gr/dscf	0.00179	0.00125	0.00136	0.00147	
lb/hr	0.93	0.65	0.70	0.76	
Total PM (M5 + M202)					
gr/dscf	0.0021	0.0015	0.0015	0.0017	
lb/hr	1.07	0.79	0.80	0.89	
lb/MMBtu (F-factor)	0.0030	0.0022	0.0023	0.0025	≤3.13
lb/MMBtu (heat input)	0.0035	0.0025	0.0026	0.0029	

Review footnotes below the Boiler 9 PM table on p. 3 of this memo.

Boiler 10 PM-10 and PM-2.5 Outlet Emissions

Parameter	Test Run Nos. and Times B10-PM10-1 11/21/14 0810-1021	B10-PM10-2 11/21/14 1048-1255	B10-PM10-3 11/21/14 1330-1536	Average	Allowable
O_2 (%)	3.8	3.7	3.6	3.7	
>PM-10					
gr/dscf	0.321E-03	0.073E-03	0.056E-03	0.150E-03	
lb/hr	0.173	0.040	0.029	0.081	
Total PM-2.5 (M201A + M202)					
gr/dscf	2.72E-03	1.96E-03	2.67E-03	2.45E-03	
lb/hr	1.47	1.07	1.41	1.32	≤3.13
Total PM-10 (M201A + M202)					
gr/dscf	2.77E-03	2.00E-03	2.84E-03	2.54E-03	
lb/hr	1.50	1.09	1.50	1.36	≤3.13

For a break-down in the above table by filterable and condensable PM-10 and PM-2.5, see the test report.