City of Santa Rosa

July 31, 2019

Jeffrey Gove
Director of Compliance and Enforcement
Bay Area Air Quality Management District
375 Beale St. St. 600
San Francisco, CA 94105

1. ☐ RECEIVED IN ENFORCEMENT: (via email) 7/30/19 877/KV

ATTN: TITLE V REPORTS

RE: Semi-Annual Monitoring Report: January – June 2019 for City of Santa Rosa Wastewater Treatment Plant, Permit for Facility #A1403

Dear Mr. Gove:

In accordance with Permit Standard Conditions Section F, this letter is provided to fulfill semi-annual monitoring reporting required for the City of Santa Rosa Wastewater Treatment Facility during the period January 1, 2019 – June 30, 2019. Pursuant to the monitoring requirements specified in the Permit, please note the following items regarding monthly and annual emissions testing:

Monthly Emission Testing and Annual Source Tests (Condition #24751)
During this period, monthly portable tests were conducted by Blue Sky Environmental for emissions from digester/natural gas fueled internal combustion engines S-200, S-201, S-202 and S-203 on January 31st, February 25th, March 29th, April 26th, May 30th, and June 27th of 2019, results are attached in Appendix A. Please note the following exceptions regarding engine testing:

- S-202 Engine 3 was not tested in February, March, April, May or June as it was out of service - except for operations related to start-up of the Selective Catalytic Reduction Unit and Oxidation Catalyst.

- S-203 Engine 4 was not tested in January, February, March, April, May or June as it was out of service – except for operations related to start-up of the Selective Catalytic Reduction Unit and Oxidation Catalyst.

Per the City of Santa Rosa's Title V permit, annual source testing is required to be conducted no later than 12 calendar months after the previous source test. The most recent source test dates are listed in the table below:

Source	Test Date
S-200 Engine 1	September 12, 2018
S-201 Engine 2	June 26, 2019
S-202 Engine 3	May 30, 2019
S-203 Engine 4	May 30, 2019

Santa Rosa Water
69 Stony Circle • Santa Rosa, CA 95401
Tel: (707) 543-4200 • Fax: (707) 543-3936

Anaerobic Digesters Gas Conditioning (Condition #18871)
Weekly H_2S monitoring is conducted on the digester gas upstream of the iron sponge abatement device (A-200) for compliance with the sulfur limit of 1500 ppm and downstream of A-200 for compliance with the H_2S content limit of 50 ppm. Results of these tests are attached with this report in Appendix B.

Emergency Generators (Condition #22820)
During the reporting period, reliability-related activities performed on the emergency standby diesel generators (S-33 and S-34) were in compliance with the limitation of < 20 hours/year.

Thank you for your consideration of this matter. Please contact Sean McNeil, Deputy Director of Environmental Services, at (707) 543-3938 for any information related to this report.

I certify that based on information and belief formed after reasonable inquiry, the statements and information in this letter are true, accurate, and complete.

Sincerely,

Jennifer Burke
Director of Santa Rosa Water

Enclosure:
Appendix A - Monthly Emission Testing Results
Appendix B - Digester Gas Quality Results

cc. BAAQMD File

APPENDIX A

Monthly Emission Testing Results

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly - JAN
Engines #1, #2 & #3

ENGINE	Eng-1	Eng-2	Eng-3	ACTION LIMITS
Test Date	1/31/19	1/31/19	1/31/19	NG/DG
Test Time	0813-0827	0848-0902	0957-1012	
Standard Temp., °F	70	70	70	
Engine kW	808	834	824	
Engine BHp	1,083	1,118	1,104	
Fuel Flow Rate, DSCFM (nat gas) NG	42	38	23	
Fuel Flow Rate, DSCFM (dig gas) DG	404	409	434	
Fuel Methane% facility readout	62.7	62.4	60.9	
Stack Flow Rate, DSCFM (Method 19)	2,237	2,333	2,213	
Oxygen, O_2, %	8.4	8.7	8.1	
NOx, ppm	73.5	86.6	93.5	
NOx, ppm @ 15% O_2	**34.7**	**41.7**	**43.1**	**65/70**
NOx, lbs/hr	1.17	1.44	1.48	
NOx, lbs/day	28.2	34.6	35.4	
NOx, gm/BHp-hr	**0.49**	**0.58**	**0.61**	**0.75**
CO, ppm	427.0	448.6	449.7	
CO, ppm @ 15% O_2	**201.6**	**216.3**	**207.4**	**348**
CO, lbs/hr	4.15	4.55	4.32	
CO, lbs/day	99.6	109.1	103.8	
CO, gm/BHp-hr	**1.74**	**1.85**	**1.78**	**2.55**

* g/BHP-hr based on Digester gas analysis dated 1/31/19

WHERE,

ppm = Parts Per Million Concentration
Lbs/hr = Pound Per Hour Emission Rate
Tstd. = Standard Temp. (°R = °F+460)
MW = Molecular Weight
DSCFM = Dry Standard Cubic Feet Per Minute
NOx = Oxides of Nitrogen as NO_2 (MW = 46)
CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 /
PPM @ 3% O_2 = ppm * 17.9 /
Lbs/hr = ppm x 8.223 E-05 x
Lbs/day = Lbs/hr * 24
gm/BHp-hr = Lbs/hr * 453.6
Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly-FEB
Engines #1, #2

ENGINE	Eng-1	Eng-2		ACTION LIMITS
Test Date	2/25/19	2/25/19		NG/DG
Test Time	0859-0914	0832-0847		
Standard Temp., °F	70	70		
Engine kW	824	835		
Engine BHp	1,104	1,119		
Fuel Flow Rate, DSCFM (nat gas) NG	60	61		
Fuel Flow Rate, DSCFM (dig gas) DG	361	363		
Fuel Methane% facility readout	64.7	63.5		
Stack Flow Rate, DSCFM (Method 19)	2,127	2,146		
Oxygen, O_2, %	8.7	8.6		
NOx, ppm	100.0	92.3		
NOx, ppm @ 15% O_2	**48.4**	**44.3**		**65/70**
NOx, lbs/hr	1.52	1.41		
NOx, lbs/day	36.4	33.9		
NOx, gm/BHp-hr	**0.62**	**0.57**		**0.75**
CO, ppm	408.6	443.1		
CO, ppm @ 15% O_2	**197.6**	**212.6**		**348**
CO, lbs/hr	3.78	4.13		
CO, lbs/day	90.6	99.1		
CO, gm/BHp-hr	**1.55**	**1.67**		
* g/BHP-hr based on Digester gas analysis dated	2/25/2019			

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9

PPM @ 3% O_2 = ppm * 17.9

Lbs/hr = ppm x 8.223 E-05 x

Lbs/day = Lbs/hr * 24

gm/BHp-hr = Lbs/hr * 453.6

Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly - MAR
Engines #1 & #2

ENGINE	Eng-1	Eng-2			ACTION LIMITS
Test Date	3/29/19	3/29/19			NG/DG
Test Time	0907-0922	0938-0954			
Standard Temp., °F	70	70			
Engine kW	825	827			
Engine BHp	1,106	1,108			
Fuel Flow Rate, DSCFM (nat gas) NG	29	53			
Fuel Flow Rate, DSCFM (dig gas) DG	442	378			
Fuel Methane% facility readout	62.7	62.4			
Stack Flow Rate, DSCFM (Method 19)	2,315	2,251			
Oxygen, O_2, %	8.3	8.5			
NOx, ppm	102.2	95.0			
NOx, ppm @ 15% O_2	**47.8**	**45.3**			**65/70**
NOx, lbs/hr	1.69	1.53			
NOx, lbs/day	40.5	36.6			
NOx, g/Bhp-hr	**0.69**	**0.62**			**0.75**
CO, ppm	457.9	485.4			
CO, ppm @ 15% O_2	**214.3**	**231.4**			**348**
CO, lbs/hr	4.60	4.75			
CO, lbs/day	110.5	113.9			
CO, g/Bhp-hr	**1.89**	**1.94**			**2.55**

* g/Bhp-hr based on Digester gas analysis dated 3/29/19

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)

PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)

Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW /

Lbs/day = Lbs/hr * 24

g/Bhp-hr = Lbs/hr * 453.6 / Bhp

Engine Bhp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly-APR
Engines #1, #2

ENGINE	Eng-1	Eng-2		ACTION LIMITS
Test Date	4/26/19	4/26/19		NG/DG
Test Time	0754-0809	0825-0840		
Standard Temp., °F	70	70		
Engine kW	787	805		
Engine BHp	1,055	1,079		
Fuel Flow Rate, DSCFM (nat gas) NG	63	55		
Fuel Flow Rate, DSCFM (dig gas) DG	334	351		
Fuel Methane% facility readout	64.7	63.5		
Stack Flow Rate, DSCFM (Method 19)	2,006	2,123		
Oxygen, O_2, %	8.8	9.0		
NOx, ppm	100.1	89.9		
NOx, ppm @ 15% O_2	**48.6**	**44.6**		**65/70**
NOx, lbs/hr	1.43	1.36		
NOx, lbs/day	34.4	32.7		
NOx, gm/BHp-hr	**0.62**	**0.57**		**0.75**
CO, ppm	419.7	445.5		
CO, ppm @ 15% O_2	**203.8**	**221.1**		**348**
CO, lbs/hr	3.66	4.11		
CO, lbs/day	87.8	98.6		
CO, gm/BHp-hr	**1.57**	**1.73**		

* g/BHP-hr based on Digester gas analysis dated 4/26/2019

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9

PPM @ 3% O_2 = ppm * 17.9

Lbs/hr = ppm x 8.223 E-05 x

Lbs/day = Lbs/hr * 24

gm/BHp-hr = Lbs/hr * 453.6

Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly-MAY
Engines #1, #2

ENGINE	Eng-1	Eng-2		ACTION LIMITS
Test Date	5/30/19	5/30/19		NG/DG
Test Time	0815-0830	0749-0804		
Standard Temp., °F	70	70		
Engine kW	796	805		
Engine BHp	1,067	1,079		
Fuel Flow Rate, DSCFM (nat gas) NG	32	40		
Fuel Flow Rate, DSCFM (dig gas) DG	402	384		
Fuel Methane% facility readout	64.7	63.5		
Stack Flow Rate, DSCFM (Method 19)	2,091	2,107		
Oxygen, O_2, %	8.8	8.8		
NOx, ppm	95.9	101.8		
NOx, ppm @ 15% O_2	**46.6**	**49.6**		**65/70**
NOx, lbs/hr	1.43	1.53		
NOx, lbs/day	34.3	36.7		
NOx, gm/BHp-hr	**0.61**	**0.64**		**0.75**
CO, ppm	507.0	475.2		
CO, ppm @ 15% O_2	**246.5**	**231.8**		**348**
CO, lbs/hr	4.61	4.35		
CO, lbs/day	110.5	104.4		
CO, gm/BHp-hr	**1.96**	**1.83**		

* g/BHP-hr based on Digester gas analysis dated 5/30/2019

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9

PPM @ 3% O_2 = ppm * 17.9

Lbs/hr = ppm x 8.223 E-05 x

Lbs/day = Lbs/hr * 24

gm/BHp-hr = Lbs/hr * 453.6

Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly - JUN
Engines #1 & #2

ENGINE	Eng-1	Eng-2			ACTION LIMITS
Test Date	6/27/19	6/27/19			NG/DG
Test Time	0914-0929	0947-1003			
Standard Temp., °F	70	70			
Engine kW	825	827			
Engine Bhp	1,106	1,108			
Fuel Flow Rate, DSCFM (nat gas) NG	29	53			
Fuel Flow Rate, DSCFM (dig gas) DG	442	378			
Fuel Methane% facility readout	57.9	62.6			
Stack Flow Rate, DSCFM (Method 19)	2,408	2,293			
Oxygen, O_2, %	8.6	8.6			
NOx, ppm	95.4	99.3			
NOx, ppm @ 15% O_2	**45.7**	**47.5**			**65/70**
NOx, lbs/hr	1.64	1.62			
NOx, lbs/day	39.3	39.0			
NOx, g/Bhp-hr	**0.67**	**0.66**			**0.75**
CO, ppm	466.5	501.4			
CO, ppm @ 15% O_2	**223.4**	**239.9**			**348**
CO, lbs/hr	4.88	4.99			
CO, lbs/day	117.1	119.9			
CO, g/Bhp-hr	**2.00**	**2.04**			**2.55**

* g/Bhp-hr based on Digester gas analysis dated 6/27/19

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)

PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)

Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW /

Lbs/day = Lbs/hr * 24

g/Bhp-hr = Lbs/hr * 453.6 / Bhp

Engine Bhp = Engine kW * 1.34

APPENDIX B

Digester Gas Quality Results

Digester Gas Quality
1/1/2019 - 6/30/2019

	--- Hydrogen Sulfide ---					
	--- ppm ---					
Date	1	2	3	4	Iron Sponge	Gas Skid
1/1/19						
1/2/19						
1/3/19						
1/4/19						
1/5/19						
1/6/19						
1/7/19	60	78	50	70	5	0
1/8/19						
1/9/19						
1/10/19						
1/11/19						
1/12/19						
1/13/19						
1/14/19	55	60	62	60	9	9
1/15/19						
1/16/19						
1/17/19						
1/18/19						
1/19/19						
1/20/19						
1/21/19	40	40	35	40	8	0
1/22/19						
1/23/19						
1/24/19						
1/25/19						
1/26/19						
1/27/19						
1/28/19	30	30	38	30	7	1
1/29/19						
1/30/19						
1/31/19						
2/1/19						
2/2/19						
2/3/19						
2/4/19	35	40	45	40	4	2
2/5/19						
2/6/19						
2/7/19						
2/8/19						
2/9/19						
2/10/19						
2/11/19	39	40	10	40	5	1
2/12/19						
2/13/19						
2/14/19						
2/15/19						
2/16/19						
2/17/19						
2/18/19	38	35	20	40	7	1

Digester Gas Quality
1/1/2019 - 6/30/2019

	--- Hydrogen Sulfide ---					
	--- ppm ---					
Date	1	2	3	4	Iron Sponge	Gas Skid
2/19/19						
2/20/19						
2/21/19						
2/22/19						
2/23/19						
2/24/19						
2/25/19	22	20	32	23	6	0
2/26/19						
2/27/19						
2/28/19						
3/1/19						
3/2/19						
3/3/19						
3/4/19	25	35	35	30	10	5
3/5/19						
3/6/19						
3/7/19						
3/8/19						
3/9/19						
3/10/19						
3/11/19	30	25	25	30	8	6
3/12/19						
3/13/19						
3/14/19						
3/15/19						
3/16/19						
3/17/19						
3/18/19	27	35	37	39	7	8
3/19/19						
3/20/19						
3/21/19						
3/22/19						
3/23/19						
3/24/19						
3/25/19	40	45	20	35	4	0
3/26/19						
3/27/19						
3/28/19						
3/29/19						
3/30/19						
3/31/19						
4/1/19	45	60	48	58	6	0
4/2/19						
4/3/19						
4/4/19						
4/5/19						
4/6/19						
4/7/19						
4/8/19	48	57	60	58	13	12

Digester Gas Quality
1/1/2019 - 6/30/2019

	--- Hydrogen Sulfide ---					
	--- ppm ---					
Date	1	2	3	4	Iron Sponge	Gas Skid
4/9/19						
4/10/19						
4/11/19						
4/12/19						
4/13/19						
4/14/19						
4/15/19	55	75	45	65	11	3
4/16/19						
4/17/19						
4/18/19						
4/19/19						
4/20/19						
4/21/19						
4/22/19	65	70	32	62	1	0
4/23/19						
4/24/19						
4/25/19						
4/26/19						
4/27/19						
4/28/19						
4/29/19	50	74	78	64	14	7
4/30/19						
5/1/19						
5/2/19						
5/3/19						
5/4/19						
5/5/19						
5/6/19	23	30	20	25	9	8
5/7/19						
5/8/19						
5/9/19						
5/10/19						
5/11/19						
5/12/19						
5/13/19	50	74	78	64	14	7
5/14/19						
5/15/19						
5/16/19						
5/17/19						
5/18/19						
5/19/19						
5/20/19	30	22	35	78	7	2
5/21/19						
5/22/19						
5/23/19						
5/24/19						
5/25/19						
5/26/19						
5/27/19		65	50	59	12	5

Digester Gas Quality
1/1/2019 - 6/30/2019

	--- Hydrogen Sulfide ---					
	--- ppm ---					
Date	1	2	3	4	Iron Sponge	Gas Skid
5/28/19						
5/29/19						
5/30/19						
5/31/19						
6/1/19						
6/2/19						
6/3/19		80	82	80	21	23
6/4/19						
6/5/19						
6/6/19						
6/7/19						
6/8/19						
6/9/19						
6/10/19		80	30	80	5	2
6/11/19						
6/12/19						
6/13/19						
6/14/19						
6/15/19						
6/16/19						
6/17/19		59	60	62	27	25
6/18/19						
6/19/19						
6/20/19						
6/21/19						
6/22/19						
6/23/19						
6/24/19						
6/25/19		60	65	60	7	0
6/26/19						
6/27/19						
6/28/19						
6/29/19						
6/30/19						
---	---	---	---	---	---	---
AVG	40	52	44	52	9	5
MIN	22	20	10	23	1	0
MAX	65	80	82	80	27	25