Ms. Michelle Luplow
EGLE – Air Quality Division
Lansing District Office
Constitution Hall, First Floor, South
525 W. Allegan Street
Lansing, MI 48933

November 5, 2024

Re: Response to Violation Notice dated October 15, 2024
De Saegher Energy, LLC (SRN: P1256)

Dear Ms. Luplow:

De Saegher Energy, LLC (De Saegher) is submitting this letter in response to a violation notice ("VN") dated October 15, 2024 from Michigan Department of Environment, Great Lakes, and Energy (EGLE). The De Saegher Renewable Natural Gas (RNG) facility is located at 8068 W Buchanan, Middleton, Michigan, and currently operates under Permit to Install (PTI) No. 94-22.

The violation notice requested a written response by November 5, 2024; De Saegher addresses the allegations of the letter below.

The De Saegher RNG facility includes two (2) anaerobic digesters that are used to process manure and capture the biogas for processing at the gas cleaning unit (EUGCU). On October 15, 2024, EGLE issued a violation notice with the following alleged violations at the De Saegher facility:

Process Description	Rule/ Permit Condition Violation	EGLE Alleged Violation
EUGCU	PTI No. 94-22, Design/Equipment Parameters, SC IV.1	A device to monitor the H2S content at the outlet of the primary H2S removal vessels (located following the blending skid) was not installed, calibrated, maintained, and operated in a satisfactory manner.
EUGCU	PTI No. 94-22, Monitoring/Recordkeeping, SC VI.2	H_2S concentration in the conditioned gas stream is not being recorded at the monitor following the blending skid, where the gas exits the primary H_2S removal vessels.

The following sections provide further details and our response to the violation notice.

Response to Alleged PTI No. 94-22 SC IV.1 Violation –
Failure to Install, Calibrate, Maintain, and Operate an H_2S Monitor

The existing H_2S monitor located at the outlet of the primary H_2S removal vessels following the blending skid was installed, calibrated, maintained, and operated according to manufacturer's specifications. The purpose of this monitor and associated requirement for air permit compliance is to demonstrate that the potential H_2S from the *tail gas* remains below the levels evaluated in PTI No. 94-22 (Note: in the PTI Application submitted on October 18, 2024, this value could be at least 150 ppm and still comply with Michigan's air toxics standards for H_2S, **even if 100% of the H_2S that enters EUGCU were to leave through the tail gas vent**).

Information from the manufacturer/EUGCU design engineers indicated that the monitor could accurately read H_2S concentrations within the expected process range. However, the high H_2S concentrations recorded at this monitor are not operationally plausible. For instance, high concentrations of H_2S at the outlet of the removal vessels would indicate that the media had been spent, which would cause consistent high readings thereafter. The data for the existing H_2S monitor shows unexpected variability in H_2S concentration. De Saegher took multiple steps to troubleshoot the monitor in an attempt to get it to provide accurate data, but readings continued to be inflated. De Saegher believes these high concentrations are inaccurate monitor readings, rather than H_2S breakthrough (i.e., the media is spent such that it is not removing H_2S) for two primary reasons, described below (Note: the target range of operation is < 16 ppmv H_2S).

Monitored Values are Potentially Erroneous

First, removing H_2S is critical from the perspective of materials of construction and asset management; if the H_2S exceeds 20 ppmv (as measured in biogas following H_2S removal, point "A" on Figure 1), the membranes would be at risk of irreversible damage that would result in equipment shutdown and replacement. Thus, if the H_2S were as high as some readings from the monitor, De Saegher would see damage of its asset (such damage has not been observed).

Second, the membranes are not capable of removing H_2S from biogas; thus, if the sulfur is not first removed by the media vessels, De Saegher would see a steady rise in H_2S concentration at the outlet of the process (point "B" on Figure 1 below) until media replacement.

Routine Monitoring for Verification

In addition, H_2S concentrations (hand samples taken approximately once per week) at the mixing tank are consistently between 0 and 1 ppm (attached for reference). The mixing tank collects biogas directly from the outlet of the H_2S removal vessels, as well as a small amount of methane rich gas recovered from membranes of the CO_2 removal system. De Saegher believes these concentrations are representative of the outlet of the H_2S removal vessels to demonstrate that the H_2S vessels have not yet experienced breakthrough. Further, demonstrating that the potential H_2S from the tail gas remains below the equivalent of 16 ppmv described previously for PTI No. 94-22 air toxics analysis.

Figure 1 depicts the simplified flow of gas from the blending skid to the sales meter.

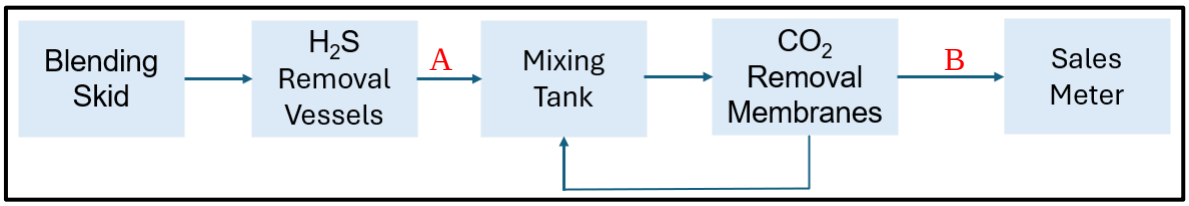

Figure 1: Simplified Block-Flow Diagram – Gas Conditioning System

Because of the data described above, De Saegher believes that the other downstream monitors provided sufficient accurate data to confirm that operations were in accordance with PTI No. 94-22.

Proposed Resolution
As stated above, De Saegher submitted PTI Application No. APP-2024-0249 that demonstrates the H_2S following the H_2S vessels could be as high as 150 ppm. Should the permit be changed to accept this analysis, the meter is expected to return values in accordance with this limit.

However, as a good faith effort to secure a monitor that can provide accurate demonstration of the actual expected range of H_2S following the H_2S removal vessels, De Saegher is in the process of replacing the monitor with a more accurate model. The new monitor will also be installed, calibrated, maintained, and operated in a satisfactory manner, pursuant to the requirement in SC IV.1 of PTI 94-22. The monitor will be replaced as soon as practical, but not later than 90 days from the date of this letter (February 3, 2025).

Response to Alleged PTI No. 94-22 SC VI.2 Violation –
Failure to Record H_2S Concentration at the Monitor following the Primary H_2S Removal Vessels
As stated, data from the existing monitor following the primary H_2S removal vessels is recorded, but it has provided H_2S concentrations that De Saegher finds not indicative of actual performance of the H_2S removal vessels. Therefore, upon request of those records by EGLE, De Saegher provided more accurate, representative H_2S concentration data from the monitor at the sales meter. Although not representative of actual operations, data from the H_2S monitor following the primary removal vessels is attached for reference.

We appreciate your review of these matters and look forward to resolving these items as efficiently as practicable. If there are questions regarding this response, please contact Mr. Eric Marko, P.E. of NTH at emarko@nthconsultants.com or 616-451-6244.

Sincerely,

Dana Kirk, Ph.D., P.E.
Chief Executive Officer
SKS

cc: Annette Switzer, P.E., EGLE
Christopher Ethridge, EGLE
Brad Myott, EGLE
Jenine Camilleri, EGLE
Robert Byrnes, EGLE
Bart De Saegher, De Saegher Energy
Paul Harrah, Taurus Biogas
Maria Barrios, M.S., SKS
Eric Marko, P.E., NTH
Madison Pritchett, NTH

Attachments

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
5/21/2024	1
6/4/2024	0
7/22/2024	0
8/22/2024	1
8/27/2024	0
9/3/2024	0
9/9/2024	0
9/11/2024	1
9/13/2024	1
9/17/2024	1
9/23/2024	1
9/25/2024	1
9/30/2024	1
10/9/2024	0
10/15/2024	0
10/18/2024	0

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
8/1/2023	Not Operating
8/2/2023	
8/3/2023	
8/4/2023	
8/5/2023	
8/6/2023	
8/7/2023	
8/8/2023	
8/9/2023	
8/10/2023	
8/11/2023	
8/12/2023	
8/13/2023	
8/14/2023	
8/15/2023	
8/16/2023	
8/17/2023	
8/18/2023	
8/19/2023	
8/20/2023	
8/21/2023	
8/22/2023	1
8/23/2023	5
8/24/2023	10
8/25/2023	7
8/26/2023	--
8/27/2023	--
8/28/2023	8
8/29/2023	3
8/30/2023	11
8/31/2023	12

Date	H_2S (ppm)
9/1/2023	--
9/2/2023	--
9/3/2023	--
9/4/2023	--
9/5/2023	--
9/6/2023	1
9/7/2023	3
9/8/2023	3
9/9/2023	6
9/10/2023	4
9/11/2023	3
9/12/2023	4
9/13/2023	5
9/14/2023	3
9/15/2023	3
9/16/2023	--
9/17/2023	--
9/18/2023	5
9/19/2023	4
9/20/2023	10
9/21/2023	11
9/22/2023	10
9/23/2023	--
9/24/2023	--
9/25/2023	6
9/26/2023	11
9/27/2023	--
9/28/2023	11
9/29/2023	12
9/30/2023	12

Date	H_2S (ppm)
10/1/2023	12
10/2/2023	11
10/3/2023	11
10/4/2023	13
10/5/2023	9
10/6/2023	11
10/7/2023	7
10/8/2023	8
10/9/2023	11
10/10/2023	12
10/11/2023	--
10/12/2023	14
10/13/2023	10
10/14/2023	8
10/15/2023	9
10/16/2023	11
10/17/2023	14
10/18/2023	10
10/19/2023	7
10/20/2023	8
10/21/2023	8
10/22/2023	9
10/23/2023	13
10/24/2023	16
10/25/2023	14
10/26/2023	12
10/27/2023	11
10/28/2023	16
10/29/2023	10
10/30/2023	7
10/31/2023	--

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
11/1/2023	8
11/2/2023	13
11/3/2023	14
11/4/2023	15
11/5/2023	15
11/6/2023	--
11/7/2023	--
11/8/2023	12
11/9/2023	14
11/10/2023	18
11/11/2023	19
11/12/2023	24
11/13/2023	26
11/14/2023	11
11/15/2023	12
11/16/2023	28
11/17/2023	29
11/18/2023	19
11/19/2023	24
11/20/2023	--
11/21/2023	--
11/22/2023	--
11/23/2023	--
11/24/2023	--
11/25/2023	--
11/26/2023	--
11/27/2023	--
11/28/2023	--
11/29/2023	13
11/30/2023	8

Date	H_2S (ppm)
12/1/2023	13
12/2/2023	26
12/3/2023	26
12/4/2023	22
12/5/2023	20
12/6/2023	14
12/7/2023	0
12/8/2023	19
12/9/2023	19
12/10/2023	15
12/11/2023	17
12/12/2023	15
12/13/2023	11
12/14/2023	2
12/15/2023	15
12/16/2023	15
12/17/2023	15
12/18/2023	10
12/19/2023	--
12/20/2023	--
12/21/2023	--
12/22/2023	--
12/23/2023	19
12/24/2023	19
12/25/2023	18
12/26/2023	21
12/27/2023	14
12/28/2023	7
12/29/2023	21
12/30/2023	24
12/31/2023	37

Date	H_2S (ppm)
1/1/2024	3
1/2/2024	3
1/3/2024	3
1/4/2024	1
1/5/2024	0
1/6/2024	0
1/7/2024	1
1/8/2024	1
1/9/2024	2
1/10/2024	3
1/11/2024	1
1/12/2024	1
1/13/2024	0
1/14/2024	0
1/15/2024	--
1/16/2024	--
1/17/2024	--
1/18/2024	--
1/19/2024	--
1/20/2024	--
1/21/2024	--
1/22/2024	--
1/23/2024	--
1/24/2024	--
1/25/2024	--
1/26/2024	--
1/27/2024	--
1/28/2024	--
1/29/2024	--
1/30/2024	--
1/31/2024	--

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
2/1/2024	1
2/2/2024	5
2/3/2024	6
2/4/2024	3
2/5/2024	3
2/6/2024	7
2/7/2024	5
2/8/2024	7
2/9/2024	3
2/10/2024	1
2/11/2024	0
2/12/2024	0
2/13/2024	0
2/14/2024	1
2/15/2024	1
2/16/2024	1
2/17/2024	0
2/18/2024	0
2/19/2024	0
2/20/2024	0
2/21/2024	2
2/22/2024	3
2/23/2024	4
2/24/2024	4
2/25/2024	3
2/26/2024	0
2/27/2024	1
2/28/2024	9
2/29/2024	5

Date	H_2S (ppm)
3/1/2024	0
3/2/2024	0
3/3/2024	1
3/4/2024	8
3/5/2024	12
3/6/2024	11
3/7/2024	12
3/8/2024	12
3/9/2024	13
3/10/2024	14
3/11/2024	15
3/12/2024	16
3/13/2024	15
3/14/2024	14
3/15/2024	14
3/16/2024	14
3/17/2024	13
3/18/2024	13
3/19/2024	13
3/20/2024	13
3/21/2024	14
3/22/2024	14
3/23/2024	15
3/24/2024	13
3/25/2024	14
3/26/2024	13
3/27/2024	11
3/28/2024	11
3/29/2024	13
3/30/2024	12
3/31/2024	13

Date	H_2S (ppm)
4/1/2024	13
4/2/2024	11
4/3/2024	11
4/4/2024	12
4/5/2024	14
4/6/2024	13
4/7/2024	14
4/8/2024	17
4/9/2024	15
4/10/2024	14
4/11/2024	15
4/12/2024	15
4/13/2024	17
4/14/2024	--
4/15/2024	20
4/16/2024	21
4/17/2024	23
4/18/2024	25
4/19/2024	24
4/20/2024	24
4/21/2024	24
4/22/2024	26
4/23/2024	30
4/24/2024	28
4/25/2024	28
4/26/2024	27
4/27/2024	31
4/28/2024	31
4/29/2024	32
4/30/2024	35

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
5/1/2024	35
5/2/2024	34
5/3/2024	35
5/4/2024	33
5/5/2024	34
5/6/2024	31
5/7/2024	30
5/8/2024	31
5/9/2024	32
5/10/2024	29
5/11/2024	31
5/12/2024	29
5/13/2024	34
5/14/2024	31
5/15/2024	29
5/16/2024	31
5/17/2024	33
5/18/2024	31
5/19/2024	33
5/20/2024	31
5/21/2024	31
5/22/2024	22
5/23/2024	22
5/24/2024	23
5/25/2024	23
5/26/2024	21
5/27/2024	23
5/28/2024	21
5/29/2024	21
5/30/2024	21
5/31/2024	20

Date	H_2S (ppm)
6/1/2024	20
6/2/2024	22
6/3/2024	21
6/4/2024	21
6/5/2024	21
6/6/2024	23
6/7/2024	22
6/8/2024	22
6/9/2024	22
6/10/2024	22
6/11/2024	22
6/12/2024	22
6/13/2024	22
6/14/2024	23
6/15/2024	19
6/16/2024	16
6/17/2024	14
6/18/2024	15
6/19/2024	15
6/20/2024	18
6/21/2024	17
6/22/2024	19
6/23/2024	19
6/24/2024	17
6/25/2024	18
6/26/2024	19
6/27/2024	19
6/28/2024	20
6/29/2024	20
6/30/2024	19

Date	H_2S (ppm)
7/1/2024	19
7/2/2024	19
7/3/2024	17
7/4/2024	18
7/5/2024	19
7/6/2024	20
7/7/2024	19
7/8/2024	19
7/9/2024	19
7/10/2024	19
7/11/2024	19
7/12/2024	20
7/13/2024	19
7/14/2024	21
7/15/2024	21
7/16/2024	23
7/17/2024	22
7/18/2024	23
7/19/2024	23
7/20/2024	23
7/21/2024	23
7/22/2024	24
7/23/2024	23
7/24/2024	25
7/25/2024	26
7/26/2024	26
7/27/2024	27
7/28/2024	27
7/29/2024	28
7/30/2024	29
7/31/2024	27

De Saegher Energy, LLC
Hydrogen Sulfide Concentration
Mixing Tank

Date	H_2S (ppm)
8/1/2024	29
8/2/2024	28
8/3/2024	29
8/4/2024	31
8/5/2024	30
8/6/2024	30
8/7/2024	31
8/8/2024	31