



**Region 2 Caribbean Environmental Protection Division
Multimedia Permits and Compliance Branch**

CAA Inspection Report

Inspection Date: 4/12/2024

Facility Name: Oil Energy Systems Inc.

Facility Address: PR-2, Km. 62.5 Arecibo, Puerto Rico 00688

ICIS-Air ID #: PR0000007201300111

EPA Lead Inspector: Alex Rivera, Enforcement Officer, rivera.alex@epa.gov, 787-977-5845

EPA Asst. Inspector: Gloria Diaz-Galarza, Enforcement Officer, diaz-galarza.gloria@epa.gov, 787-977-5882

Facility Contact(s): Barbara Ramos Sanfiorenzo, Process Coordinator, bramos@oespr.net
Jorge A. González, President, gonzalezja@oespr.net
Daniel Martínez, Plant Supervisor

This report is a summary of observations and information gathered from the facility at the time of the inspection. The information provided does not constitute a final decision on compliance with Clean Air Act ("CAA") regulations or applicable permits, nor is it meant to be a comprehensive summary of all activities and processes conducted at the facility.

Summary of Onsite Observations

A. Opening Conference

The representatives of the United States Environmental Protection Agency (USEPA), Alex Rivera and Gloria Diaz-Galarza arrived at the Oil Energy Systems Inc. facility located at PR-2, Km. 62.5 in Arecibo, PR ("OES" or "the Facility") at approximately 9:40 am. The EPA representatives ("the inspectors") were met upon arrival by Mr. Daniel Martínez, Facility Supervisor and Eng. Barbara Ramos Sanfiorenzo, Facility Process Coordinator. The inspectors were escorted by Mr. Martínez and Eng. Ramos to a conference room for conducting the inspection opening conference. The inspectors formally presented their identification credentials and provided an overview and scope of the inspection. The following is a summary of the topics discussed during the opening meeting that were mainly focused on OES's Pyrolysis Unit ("the Unit"):

1. Air emission source construction permit status – Eng. Ramos confirmed that OES environmental consultant is working with DNER on the construction permit.
2. Pyrolysis Unit operational status (Unit) – Eng. Ramos and Mr. Martínez stated that the Unit was not in operation and that a contractor is working on the Pyrolysis Unit product storage tanks construction and that two (2) out of the four (4) product storage tanks are already fully constructed. According to Mr. Martínez, the piping for connecting the storage tanks with the Unit are pending construction. OES is working on the calibration of all the Unit pressure and temperature meters as part of the Unit conditioning and maintenance activities.

3. Pyrolysis Unit operational scenarios – Eng. Ramos explained that the Unit will be only processing plastic discarded from manufacturing facilities and used oil containers. OES representatives are not aware of a specific plastic to used oil containers ratio to be processed but acknowledged that for obtaining an approval for using the product as an alternate fuel it will be important to achieve a consistent quality. OES is already collecting plastic from the companies such as Thermoplastics in Añasco, but no formal contract are in place for supplying the Unit raw material. OES installed a shredding unit to facilitate the handling and storage of the plastic within the Pyrolysis Unit building. Eng. Ramos explained that prior to shredding the material, it is inspected and sorted to avoid processing any unwanted material. Also added that the shredder has a metal detector to remove any metals. Mr. Martínez further explained that the used oil containers that will be processed are those from transmission oil, brake fluid, motor oil, and windshield washing products. Eng. Ramos indicated that OES plans to inspect these used oil containers to avoid any excess oil residuals or processing any unwanted material.
4. Procedures and training– Eng. Ramos stated that several procedures are in the process of being drafted for addressing activities such as raw material handling and processing and that OES is planning to conduct training on how to implement these procedures. The inspectors emphasized on the importance of having written procedures and providing training.
5. Emission control devices – Eng. Ramos stated that the Unit has a thermal oxidizer for treating the residual process gases identified by Eng. Ramos as syngas and explained that the gases from the reactor are treated using two (2) catalysts, a heat exchanger and two (2) scrubbers in series located indoors before the syngas is used as supplemental gas in the Unit reactor burner box, the residual syngas is treated in the thermal oxidizer. In addition, the Unit has one (1) wet scrubber located outdoor on which the combustion gases generated in the Unit burner box are treated.
6. Product – Eng. Ramos stated that OES aims to use the Unit product as a diesel substitute and mentioned boilers as a potential application.
7. Used oil facility – Mr. Martínez explained that to mitigate the odors that can be generated from OES’s used oil facility, the used oil receiving area is being cleaned in a weekly basis and that are working on a project to cover the wastewater treatment plant tanks.

B. Facility Tour

At approximately 11:10 am, Mr. Martínez and Eng. Ramos led the inspectors on a tour of the facility. The inspectors explained that during the facility tour, they would capture digital images of the facility, both Mr. Martínez and Eng. Ramos agreed. The digital images taken during the inspection are included in Appendix A. The following is a summary of the observations during the Facility walkthrough:

1. The Facility is storing plastic material within the Pyrolysis Unit building. Several large cardboard boxes were observed shelved in pallets racks. Some of the cardboard boxes were full of shredded plastic material. See images P4120033-P4120036 and P4120038 in Appendix A for more details.
2. Eng. Ramos explained that as indicated during the Opening Meeting, OES is receiving plastic material and shredding it to maximize storage space.
3. The Facility has a weighing station for the shredded plastic material.
4. A shredder unit was observed in operation. See P4120037 in Appendix A for more details. Several operators were observed placing the plastic material in an open table to sort the material prior to be shredded. Eng. Ramos explained that operators inspect the material and discard any non-plastics or domestic waste.
5. According to Eng. Ramos, the Pyrolysis Units is projected to operate 24 hours with 3 shifts with 5-6 operators each.
6. Mr. Martínez confirmed that the Facility product storage tanks will include two (2) 100,000 gallons tanks, one (1) 200,000 gallons tank and one (1) 400,000 gallons tank.

7. The Facility has one (1) pyrolysis rotary kiln reactor. See images P4120039, P4120040, and P4120059 in Appendix A for more details. The reactor has a burner box on which propane and excess syngas are used as fuel. Eng. Ramos explained that the combustion gases that are generated as part of the burner box and the enclosure of the rotary kiln are collected and conveyed through a wet scrubber. Eng. Ramos further explained that the syngas is generated as a result of the the pyrolysis process within the reactor and that prior to be used as supplemental gas in the rotary kiln burner box it is treated using a series of catalysts, heat exchangers and scrubbers. Eng. Ramos also mentioned that the excess syngas that it is not used as supplemental gas, is conveyed, and treated through a thermal oxidizer. See image P4120041 in Appendix A for more details about the syngas scrubbers.
8. Eng. Ramos explained that cardboard boxes are not going to be inserted in the reactor and that OES is considering acquiring plastic sacks to place the material in the reactor.
9. The inspectors were led outdoors where the Facility thermal oxidizer and wet scrubber are located. See images P4120042-P4120049 in Appendix A for more details. The inspectors informed Mr. Martínez and Eng. Ramos that both units are starting to show corrosion issues and that the wet scrubber is identified as a dust collector in the process layout that was included in the Facility air emission source construction permit application.
10. The thermal oxidizer is equipped with a flame arrestor. See image P4120047 in Appendix A for more details.
11. At the time of the inspection there was a contractor working on construction activities in two (2) of the Facility storage tanks. Construction activities on two (2) out the four (4) storage tanks are already completed. See images P4120050-P4120051 and P4120058 in Appendix A for more details.
12. The Facility has one (1) diesel burning emergency power generator and one (1) propane (liquified) storage tank of 1,000 gallons. The emergency power generator brand is Stamford and the engine Volvo Penta, and it has an internal diesel storage tank (double wall) of 1,300 gallons. The inspectors verified the engine run time meter and it showed a run time of 2,255 hours and 43 minutes. The engine run time meter also showed that the unit was started 327 times. The inspectors asked Mr. Martínez about the reason of these frequent engine operation. Mr. Martínez explained that the Pyrolysis Unit building is not connected to Puerto Rico' power grid and that they are relying on a temporary power connection from OES used oil facility and the emergency engine to maintain activities within the Pyrolysis Unit building.

At approximately 12:20 pm, the inspectors concluded the walkthrough and proceeded with the inspection closing meeting.

C. Closing Meeting

A downpour affected the ability of the group to return to the Facility conference room, so the closing meeting was conducted within the Pyrolysis Unit building. The inspectors informed Eng. Ramos and Mr. Martínez that a follow up email will be sent to OES with a list of questions and information that will be evaluated as part of the post inspection activities. The inspectors informed that among the information to be requested will be a Pyrolysis Unit process layout that is representative of the equipment currently onsite, copy of the Facility federal regulatory applicability determination, copies of the Pyrolysis Unit material handling procedures, and a more detailed description of the different types of used oil containers that will be processed in the Unit. The inspectors informed that the email may contain additional items to be requested. The inspectors thanked Eng. Ramos and Mr. Martínez for their time and cooperation during the inspection and informed that EPA would provide OES with an inspection report in approximately 60 days. At approximately 12:30 pm, the inspectors departed from the facility.

Appendices

A. Digital Image Log

End of Report

Lead Inspector's Name: Alex Rivera

ALEX
RIVERA

Digitally signed by ALEX
RIVERA
Date: 2024.05.14
07:23:36 -04'00'

Assisting Inspector's Name: Gloria Diaz-Galarza

GLORIA DIAZ-
GALARZA

Digitally signed by
GLORIA DIAZ-GALARZA
Date: 2024.05.14
08:14:41 -04'00'

Supervisor's Name: Nancy Rodríguez

NANCY
RODRIGUEZ

Digitally signed by
NANCY RODRIGUEZ
Date: 2024.05.14
10:27:07 -04'00'

Appendix A: Digital Image Log for Oil Energy Systems Inc., Arecibo, PR				
Facility Address: PR-2, Km. 62.5 Arecibo, Puerto Rico 00688		Inspectors: Alex Rivera, EPA, Gloria Diaz-Galarza, EPA,	Image numbers: P4120033 through P4120059 Camera Used: Olympus Tough T-6-6 (EPA Decal # SM0134)	
File name: Appendix A Digital Image Log Safetech_2024-03-27				
Image Number	File Name	Description	Date Taken	Time taken
1	P4120033.JPG	 Partial view of shredded plastic material storage area within the Pyrolysis Unit building.	4/12/2024	11:11 am

2	P4120034.JPG		4/12/2024	11:12 am
		Partial view of shredded plastic material stored at the Pyrolysis Unit building.		
3	P4120035.JPG		4/12/2024	11:12 am
		Partial view of shredded plastic material stored at the Pyrolysis Unit building.		

4	P4120036.JPG	 Partial view of plastic material stored at the Pyrolysis Unit building.	4/12/2024	11:16 am
5	P4120037.JPG	 Partial view of the shredding unit within the Pyrolysis Unit building facing southwest.	4/12/2024	11:17 am

6	P4120038.JPG		4/12/2024	11:17 am
7	P4120039.JPG		4/12/2024	11:26 am

Shredded plastic material stored at the Pyrolysis Unit building.

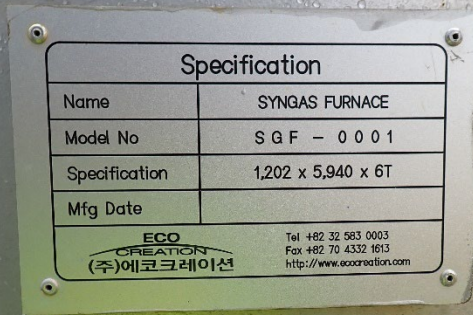
View of the Pyrolysis Unit reactor facing northwest.

8	P4120040.JPG	 Partial view of the Pyrolysis Unit reactor facing west.	4/12/2024	11:27 am
9	P4120041.JPG	 View of the Pyrolysis Unit syn-gas scrubbers facing southeast.	4/12/2024	11:28 am

10	P4120042.JPG	 Partial view of water storage tank and reactor combustion gases pipeline connected to the wet scrubber.	4/12/2024	11:29 am
11	P4120043.JPG	 View (facing west) of the Pyrolysis Unit wet scrubber connected to the reactor combustion gases pipeline.	4/12/2024	11:29 am

12	P4120044.JPG		4/12/2024	11:30 am
		View of the Pyrolysis Unit wet scrubber fan and blower specifications plate.		
13	P4120045.JPG		4/12/2024	11:32 am
		View (facing east) of the Pyrolysis Unit wet scrubber connected to the reactor combustion gases pipeline.		

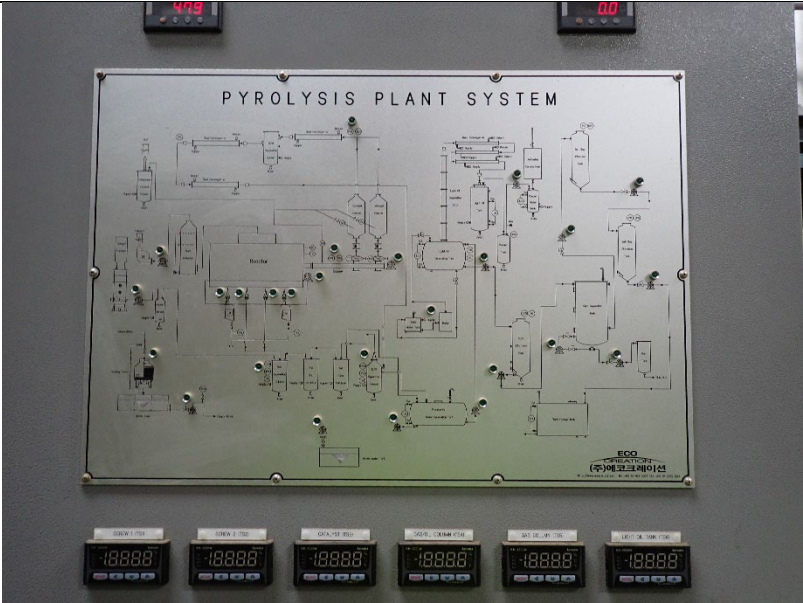
14	P4120046.JPG	 View (facing southeast) of the Pyrolysis Unit thermal oxidizer connected to the residual syn-gas pipeline.	4/12/2024	11:32 am
15	P4120047.JPG	 View (facing west) of the thermal oxidizer flame arrestor.	4/12/2024	11:33 am

16	P4120048.JPG	 View (facing west) of the thermal oxidizer flame arrestor specification plate.	4/12/2024	11:33 am
17	P4120049.JPG	 View (facing west) of the thermal oxidizer specification plate.	4/12/2024	11:35 am

18	P4120050.JPG		4/12/2024	11:35 am
19	P4120051.JPG		4/12/2024	11:35 am

Partial view (facing northeast) of the Pyrolysis Unit product storage tanks.

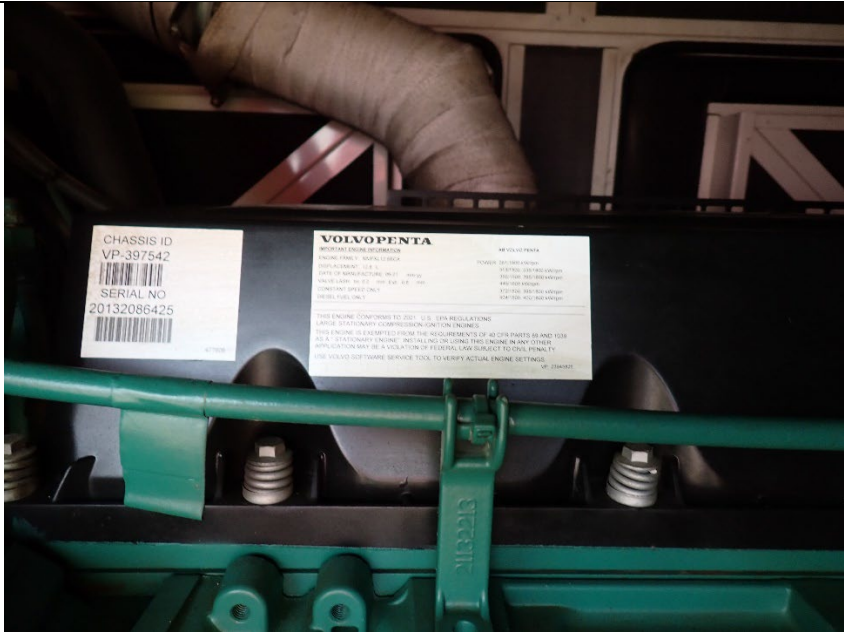
Partial view (facing northeast) of the Pyrolysis Unit product storage tanks.

20	P4120052.JPG		4/12/2024	11:43 am
21	P4120053.JPG		4/12/2024	11:59 am

View of the Pyrolysis Unit process diagram.

View (facing north) of the Pyrolysis Unit two (2) catalyst columns.

22	P4120054.JPG	 Partial view (facing north) of the Pyrolysis Unit heat exchanger located after the catalyst columns.	4/12/2024	12:00 pm
23	P4120055.JPG	 View of the emergency generator specification plate.	4/12/2024	12:11 pm

24	P4120056.JPG	 View of the emergency generator engine specification plate.	4/12/2024	12:12 pm
25	P4120057.JPG	 Partial view of the emergency generator diesel tank.	4/12/2024	12:13 pm

26	P4120058.JPG		4/12/2024	12:20 pm
27	P4120059.JPG		4/12/2024	12:21 pm

Partial view (facing northwest) of the Pyrolysis Unit storage tanks.

Partial view (facing west) of the Pyrolysis Unit.