

October 18, 2023

Mr. Daniel C. Husted, P.E.
Chief, Facilities Permitting Section
Pennsylvania Department of Environmental Protection
Air Quality Program
Northcentral Regional Office
208 West Third Street
Suite 101
Williamsport, PA 17701

**Re: Encina Fort Union LLC – Plan Approval Application 49-00069A
Response to PADEP Technical Deficiency**

Dear Mr. Husted,

On August 4, 2023, Encina Fort Union LLC (Encina) received the Department’s technical deficiency letter regarding the above-referenced Plan Approval Application (PAA) for a proposed plastics sorting operation in Point Township, Northumberland County. On August 11, 2023, Encina submitted an extension request for response to the technical deficiency letter, which the Department accepted. On behalf of Encina, ALL4 LLC (ALL4) is submitting this letter in response to the cited technical deficiency. This response is being submitted by the agreed upon extension request deadline (i.e., by November 2, 2023). Encina’s response to the technical deficiency identified by the Department is set forth below.

Summary of salient points that will be discussed in this letter:

- Emissions have been estimated to be 200% to 400% higher if add-on controls were used than would a standard U.S. EPA Tier-certified emergency-only engine as proposed in the PAA were used because the engines with add-on controls would have to run for many more hours in order to ensure that the add-on control systems have been readiness tested.
- Table 1 shows the very low actual emissions levels of the proposed emergency-only engines [~0.02-0.2 tons per year (tpy)], and a later discussion shows that increased emissions would actually result in ~2-4 times higher emissions than existing readiness testing times for U.S. EPA Tier-certified emergency-only engines.
- The use of U.S. EPA Tier-certified emergency-only engines, as proposed in the PAA, is standard practice in Pennsylvania and throughout the United States as best available technology (BAT), or equivalent, for emergency-only engines.
- Any use and operation of add-on controls during emergency situations compromises the purpose of the equipment (i.e., to provide reliable emergency response) by putting the

reliability of operation of the emergency-only engine in jeopardy at the very time it is needed for safety.

- The proposed emergency-only engines would qualify for an Exemption from Plan Approval under current the DEP Policy Document and/or General Permit No. 9 (GP-9).

In order to understand an appropriate BAT assessment for emergency-only engines, it is necessary to understand the fundamental purpose of an emergency-only engine along with how few hours these engines typically operate in a year and as such, how low the annual emissions are associated with emergency-only engines (i.e., fire pumps and emergency electrical generators). The U.S. EPA recognizes how different emergency-only engines are from other uses of offroad engines, which will be discussed more later. While U.S. EPA has recommended using 500 hours per year for maximum potential emissions estimates, even U.S. EPA has limited emergency-only engine runtime for readiness testing and maintenance (i.e., limiting runtime for all operation other than true declared emergencies) to less than 100 hours per year by regulation. The statistics on typical actual annual runtimes for emergency-only engines are even less, at 20-30 hours per year. Emergency-only engines are a critical element in a facility's Emergency Plan, with the singular most important function to be readily available when needed in order to ensure water availability to fight fires, and emergency power to stabilize and shutdown equipment in a safe manner when loss of power from the electrical grid jeopardizes these functions.

PADEP Comment: *Section 6 of the revised application details the Best Available Technology (BAT) analysis for the sources in the proposed plan approval, including the reciprocating internal combustion engines (RICE) associated with the emergency generator and two fire pumps. The included analysis states that purchasing RICE certified to NSPS standards (Subpart IIII) and operating the engines in accordance with the manufacturer's operating procedures is BAT for the RICE. The BAT analysis provided in the plan approval application for these RICE is incomplete. Pursuant to 25 Pa. Code § 127.12(a)(5), a plan approval application shall show that the emissions from proposed sources will be the minimum attainable through the use of the best available technology. A complete BAT analysis for the RICE should include an evaluation of the technical and economic feasibility of installing add-on control technologies as well as purchasing engines certified to emission standards more stringent than the NSPS minimum requirements (e.g. Tier IV certified engines).*

Encina Response:

Encina believes that add-on technologies would be counterproductive, and that any requirement that the analysis be performed is contrary to well-established precedent. This view is buttressed by the availability of an exemption provided under Document No. 275-2101-003, Section 127.14(a)(8), Exemption No. 6, as well as Air Quality GP-9 [Diesel or No. 2 Fuel Fired Internal Combustion Engine(s), Document No. 2700-PM AQ0209].

As set forth in the PAA, Encina is proposing that the latest available U.S. EPA Tier-certified engines will be installed, which satisfies BAT. Prior to the submittal of the PAA, Encina presented the use of Tier-certified engines as BAT for these emergency-only engines to the Department during the pre-application meeting held on October 28, 2022, at which time the Department had no objection or recommendation that further BAT analysis would be necessary. Encina disagrees with the Department's statement that *"The BAT analysis provided in the plan approval application for these RICE is incomplete."* The use of Tier-certified engines has routinely been accepted by the Department as BAT for emergency-only engines, without the additional requirement to include an evaluation of the technical and economic

feasibility of installing add-on controls. This is also consistent, for example, with the New Jersey Department of Environmental Protection (NJDEP) implementation of State-of-the-Art (SOTA) and the South Coast Air Quality Management District (SCAQMD) implementation of best available control technology (BACT), which are equivalent to PADEP BAT, for emergency-only engines. The use of Tier-certified engines as BAT, without the need for a top-down control analysis, has been widely accepted as general practice across the United States for emergency-only engines.

There are several reasons why conducting a top-down BAT control analysis for emergency-only engines is unprecedented, uncalled for, and is antithetical to best practices. Principally, by definition, emergency-only engines are required to respond to emergency situations and ensure the facility can operate safely during these scenarios (e.g., fire response, unexpected power outages). By definition, aside from planned maintenance or readiness testing, operation of these units is unplanned and sporadic. For this reason, U.S. EPA has recognized a separate regulatory class for emergency engines under the RICE rules (e.g., 40 CFR Part 63, Subpart ZZZZ and 40 CFR Part 60, Subparts IIII/JJJJ). This separate emergency class includes different requirements for not only emissions standards, but also the level of emissions control required and allowable engine runtime. The RICE rules limit the runtime of emergency-only engines for maintenance and readiness testing to 100 hours per year. In a June 23, 2006, document titled "Response to Public Comments on Proposed Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," U.S. EPA states:

*"Considering the extent to which commenters provided information indicating that the proposed 30 hours per year allowance was not sufficient for most emergency engines, EPA has determined that it is appropriate to allow emergency engines to operate 100 hours per year during maintenance and testing. **It is crucial to allow owners and operators of emergency engines to sufficiently test and maintain their emergency engines to ensure the engines will respond properly and as expected during an emergency situation. The engines must respond without failure and without lengthy periods of startup and adequate testing and maintenance must therefore be performed.** Based on the comments received, EPA believes that 100 hours per year is a sufficient amount to ensure readiness of emergency engines in most cases. The final rule has been written to limit operation of emergency engines to 100 hours per year during maintenance and testing operation..."*

Outside of infrequent emergencies, our industry experience indicates that normal runtimes for emergency-only engines to be approximately 25 hours per year, which includes monthly readiness testing. However, the use of add-on controls would significantly lengthen the runtime needed in order to properly test the controls. Longer readiness testing would be required to ensure proper operating temperatures of the add-on controls are met prior to running, which would require engine operation at greater than half load. The use of selective catalytic reduction (SCR) requires a minimum SCR operating temperature range of 480°F – 800°F in order to achieve NO_x emissions reductions¹. Because this operating temperature could not easily be met under the standard operating conditions of an emergency-only engine, testing would require the engine to be operated for longer periods of time and at increased loads to achieve the SCR permissive temperature. This would also result in the need for a load bank (e.g., heatsink needed for the excess power generated) in order to fulfill the load required to operate the engine and add-on controls.

During typical engine readiness testing the engine is started and brought up to temperature, checked for leaks, and other engine system checks. The engine is never put under a sustained load, typically

¹ U.S. EPA. *Air Pollution Control Technology Fact Sheet (EPA-452/F-03-032)*

operating at ~10-15% load. This type of check is approximately 30 minutes in duration and is typically performed monthly. During the year, there are other maintenance activities that require additional engine runtime for verification, which makes up the remainder of a typical 25 hour per year readiness and maintenance testing schedule.

It is important to note that the additional engine operation needed to conduct required testing of the add-on control device would ultimately result in more equipment runtime, thereby increasing air emissions. For non-emergency engines that require testing of add-on controls, they must be brought up to at least 30-50% load in order to achieve the necessary temperatures required for the controls to function. Achieving this level of operation, and then performing the necessary testing of engine and control systems, requires at least one hour or more. This is more than twice the amount of time needed to readiness test emergency-only engines without add-on controls, and also results in the need to operate the engines at higher loads, which alone would result in higher emissions before the controls begin to reduce emissions. **Therefore, an emergency-only engine with add-on controls would result in at least 2-4 times the emissions of a Tier-certified emergency-only engine.** Additionally, the increased non-emergency readiness testing runtime requirements could also result in an exceedance of the allowable runtime limits under the RICE rules for emergency-only engines (i.e., 100 hours per year). A summary of potential NO_x emissions from the proposed emergency-only engines at various annual runtimes is provided in Table 1 for reference.

**Table 1
Summary of Emergency-Only Engine NO_x Emissions**

Engine and Size	Emissions Factor	Units	Reference	PTE			
				(lb/hr)	(tpy @ 25 hr/yr)	(tpy @ 100 hr/yr)	(tpy @ 500 hr/yr)
Fire Pump (235 kW)	3.50	g/kW-hr	40 CFR Part 60, Subpart IIII ^(a)	1.81	0.02	0.09	0.45
EGen (1,250 kW)	5.61	g/kW-hr	U.S. EPA Tier 2 ^(a)	15.45	0.19	0.77	3.86

^(a) Emissions factors for NO_x for the fire pump and EGen are based on the NO_x + NMHC (VOC) emissions factors from Table 4 to 40 CFR Part 60, Subpart IIII of 4.0 g/kW-hr and the U.S. EPA Tier 2 emissions factor of 6.4 g/kW-hr, respectively. Individual NO_x emissions factors have been derived by applying the ratio of U.S. EPA Tier 1 emissions factors for NO_x (9.2 g/kW-hr) and HC (VOC) (1.3 g/kW-hr) to the respective emissions limits for NO_x + NMHC (VOC).

Furthermore, the required use and operation of add-on controls during emergency situations compromises the purpose of the equipment (i.e., to provide reliable emergency response). During such critical operating scenarios of lost power or fire response, the added complexity of also being required to operate add-on controls would put the reliability of the emergency-only engine in jeopardy. Therefore, it would be prudent for the facility to also provide a backup to the emergency-only engine in the event of an equipment fault during startup because of the add-on control systems. Again, this would ultimately result in increased air emissions and greater operating costs than would reasonably result from the emergency-only engines if operating in a normal scenario.

For these reasons, a request from the Department to conduct a top-down BAT control analysis presupposes that the use of add-on controls, which would complicate the operation of the engines during actual emergencies as well as require additional operation/emissions from the engines for testing purposes, is a good or desirable outcome of such a top-down analysis. For all the reasons described above, Encina does not agree that a top-down control analysis is appropriate for the proposed

emergency-only engines that are limited by U.S. EPA to runtimes not to exceed 100 hours per year for non-emergency purposes.

Our points are supported additionally by the facts that: (1) emergency-only generators qualify for a Plan Approval Exemption; and (2) such generators which may not have such treatment are, in any event, qualify for a General Permit.

The Department frequently does not require a plan approval at all for emergency engines because they qualify for Exemption No. 6 of Document No. 275-2101-003, Section 127.14(a)(8), which states that the following sources are exempt from plan approval requirements:

“Internal combustion engines regardless of size, with combined NOx actual emissions less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season and 6.6 tons per year on a 12-month rolling basis for all exempt engines at the site. This category does not apply to newly installed engines of a model year that is not within five years of the installation date unless the engine meets the applicable New Source Performance Standard emission rates that apply to a newly manufactured engine. The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or the general plan approvals/general operating permits at the facility. This category does not apply if an add-on air cleaning device, such as selective catalytic reduction (SCR), is installed. Note Category 38 addresses oil and gas facilities.”

As demonstrated in the PAA, the proposed emergency-only engines meet this exemption criteria.

In addition, the application would also qualify under Air Quality GP-9 [Diesel or No. 2 Fuel Fired Internal Combustion Engine(s), Document No. 2700-PM AQ0209]. It is also important to note that GP-9 includes established BAT for engines, which for the size of engines proposed and the duration of operation for this type of use does not require add-on controls for emergency-only engines.

Notwithstanding the exemption and GP-9, Encina chose to submit the engines to the Department under PAA for completeness and transparency, which was also discussed and agreed upon during the October 28, 2022, pre-application meeting.

In conclusion, Encina believes that PADEP has all of the necessary information to review and issue a Plan Approval that allows construction of the Phase 1 air emissions units.

If you have any questions regarding this information in this response, please contact me at (610) 422-1136, or at jslade@all4inc.com.

Sincerely,
ALL4 LLC



John Slade
Senior Consultant

cc: Muhammad Zaman (PADEP)
Sheida Sahandy (Encina)