

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date:, 2018

Region: Asheville Regional Office
County: Polk
NC Facility ID: 7500100
Inspector's Name:
Date of Last Inspection: N/A (new facility)
Compliance Code:

Facility Data			Permit Applicability (this application only)
<p>Applicant (Facility's Name): Public Service Co of NC, Mill Spring Compressor, Silver Creek</p> <p>Facility Address: Public Service Co of NC, Mill Spring Compressor, Silver Creek 823 Silver Creek Road Mill Spring, NC 28756</p> <p>SIC: 4922 / Natural Gas Transmission NAICS: 48621 / Pipeline Transportation of Natural Gas</p> <p>Facility Classification: Before: N/A After: Small Fee Classification: Before: N/A After: Small</p>			<p>SIP: Yes NSPS: Yes (Subparts JJJJ, KKKK and OOOOa) NESHAP: Yes (Subpart ZZZZ) PSD: No PSD Avoidance: No NC Toxics: Yes 112(r): No Other: N/A</p>
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 7500100.17A Date Received: 12/07/2017 Application Type: Greenfield Facility Application Schedule: State Existing Permit Data Existing Permit Number: N/A Existing Permit Issue Date: N/A Existing Permit Expiration Date: N/A</p>
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<p>Review Engineer: Patrick Ballard</p> <p>Review Engineer's Signature: _____ Date: _____</p>		<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 10562/R00 Permit Issue Date: Permit Expiration Date:</p>	

1. Purpose of Application:

Application is made for the issuance of a new air quality permit for a greenfield natural gas-powered compressor station. The new compressor station is part of upgrades to an existing natural gas pipeline, running from Kings Mountain, NC to Arden NC. PSNC currently operates an existing compressor station in the Mill Spring area (site No. 7500097). This new station is intended to be the main station once online, with the 7500097 site serving as a backup. The facility application includes the following equipment. The compressor turbines will each be equipped with SoLoNOx technology which utilizes lean-premixed combustion technology to ensure a more uniform air to fuel mixture to help control the combustion process to prevent NOx and CO emissions from forming. There are no add-on control devices being installed for these sources.

Emission Source ID	Emission Source Description	Control System ID	Control System Description
ES-1, ES-2 and ES-3 NSPS	Three natural gas-fired compressor turbine sets (51.52 million Btu per hour heat input and 6,091 horsepower output, each) equipped with SoLoNOx technology	N/A	N/A
ES-4	Twelve natural gas-fired catalytic heaters (0.06 MMBtu/hr, each)	N/A	N/A
ES-5	Two natural gas-fired fuel gas heaters (0.77 MMBtu/hr, each)	N/A	N/A
ES-6	One condensate tank (1000-gallon capacity)	N/A	N/A

Insignificant activities listed in the application are as follows.

Source
I-Em. Gen. - one natural-gas fired emergency generator (755 brake horsepower; 500KW) Note, The emergency generator was included in the Toxics modeling but is exempted from Toxics per 2Q .0702(a)(27)(B) (MACT source exemption) and thus will be listed as an insignificant activity.
I-Cat. Heaters - twelve natural gas-fired catalytic heaters (0.06 MMBtu/hr, each) Note, the catalytic heaters were included in the Toxics modeling and thus they will be included in the permit equipment list as ES-4.
I-Fuel Heaters - two natural gas-fired fuel gas heaters (0.77 MMBtu/hr, each) Note, the fuel gas heaters were included in the Toxics modeling and thus they will be included in the permit equipment list as ES-5.
I-Fugitives - fugitive equipment leaks
I-Blow Down - compressor blow down fugitive emissions
I-Cond. Tank - one condensate tank (1000-gallon capacity) Note, the condensate tank was included in the Toxics modeling and thus it will be included in the permit equipment list as ES-6.

Note, the application also lists three 300-gallon wash tanks. However, these are not listed on the insignificant activities page because no emissions are indicated.

2. Application Chronology:

- 11/14/2017 Meeting with PSNC about project.
- 12/07/2017 Application, including \$50, and authorized signature is received by the ARO.
- 12/13/2017 DAQ ARO personnel visited the site to observe the public notification sign.
- 12/28/2017 Zoning letter received by ARO.
- 01/11/2018 DAQ sent a request for additional information concerning toxics (modeling for benzene and formaldehyde).

02/08/2018 Modeling results submitted to DAQ.

02/20/2018 DAQ email to consultant about facility location.

02/21/2018 Emails concerning environmental justice review.

02/26/2018 Email from consultant about facility location.

03/13/2018 Emails between DAQ AQAB and consultant about modeling.

03/15/2018 DAQ email about modeling.

03/16/2018 Conversation between DAQ and consultant about NSPS KKKK.

03/20/2018 Emails from consultant about modeling and NSPS KKKK.

03/25/2018 Email from consultant about NSPS KKKK

03/27/2018 Modeling results approved by AQAB, DAQ.

03/27/2018 DAQ email to consultant about NSPS KKKK.

03/28/2018 DAQ email to consultant about emergency generators.

03/29/2018 Email from consultant about emergency generators.

03/30/2018 Email from consultant about NSPS KKKK

04/02-03/2018 Emails between DAQ and consultant about emergency generators.

04/04/2018 Email from consultant about emergency generators.

04/09/2018 Emails from consultant about emergency generators and modeling.

04/11/2018 Email from consultant about NSPS KKKK and fuel sulfur certification.

3. Regulatory Review

The Company must comply with the following EMC Regulations for this application:

15A NCAC 2D .0516,"Sulfur Dioxide Emissions from Combustion Sources";
15A NCAC 2D .0521,"Control of Visible Emissions";
15A NCAC 2D .0524,"New Source Performance Standards, Subpart KKKK, Subpart JJJJ and Subpart OOOOa";
15A NCAC 2D .0535,"Excess Emissions Reporting and Malfunctions";
15A NCAC 2D .0540, "Particulates from Fugitive Non-process Dust Emission Sources";
15A NCAC 2D .1100,"Control of Toxic Air Pollutants";
15A NCAC 2D .1111,"NESHAP, Subpart ZZZZ";
15A NCAC 2D .1806,"Control and Prohibition of Odorous Emissions";
15A NCAC 2Q .0113,"Notification in Areas Without Zoning"; and
15A NCAC 2Q .0711,"Emission Rates Requiring a Permit".

4. Compliance Determination

a. Three natural gas-fired compressor turbine sets (6,043 Hp output; 51.13 MMBtu/hr maximum heat input rate, each) ID Nos. ES-1, ES-2 and ES-3

2D .0516, which limits sulfur dioxide emissions to 2.3 lb/MMBtu heat input. Compliance is demonstrated through the use of natural gas which has an inherently low enough sulfur content to always comply with this rule. The three turbines are subject to NSPS standards for sulfur dioxide. Thus, 2D .0516 does not apply. 2D .0516 does apply to the remaining combustion sources.

2D .0521, which limits visible emission to 20% opacity. Compliance is expected based on observations of similar units and will be verified during inspections.

2D .0524, NSPS Subpart KKKK, applies to each of these turbines since they are installed after February 18, 2005 and each has a heat input greater than 10 mmBtu/hr. This rule regulates sulfur dioxide (SO₂) and oxides of nitrogen (NO_x) emissions as follows:

Compressor Turbine	Heat Input (mmBtu/hr)	NO _x [ref. 60.4320 and Table 1]	SO ₂ [ref. 60.4330(a)(2) and 60.4365(a)]
ES-1	51.13	25 ppm at 15% O ₂ or 150 ng/J of useful output (1.2 lb/MWh)	natural gas shall not contain in excess of 20 grains of sulfur per 100 cubic feet and shall have potential sulfur emission of no more than 0.060 lb SO ₂ /MMBtu heat input
ES-2	51.13		
ES-3	51.13		

Data provided by manufacture lists NO_x emissions at various ambient temperatures from 32 to 100 degrees F. Worst case NO_x emissions are at 100 degrees F at 0.74 lb/MWh and 15 ppm at 15% O₂ (well below the standard).

The facility has chosen for these turbines to meet the NO_x requirements by complying with 60.4340(b)(2)(ii) “for lean premix stationary combustion turbines... by continuously monitoring the appropriate parameters to determine whether the unit is operating in low-NO_x mode”.

The facility’s consultant submitted an email on 03/30/2018 that the “appropriate parameters” are the monitoring of “T5” combustion fuel temperature and pilot fuel flow. The “T5” combustion flame temperature schedule is developed at the factory and continuously monitored during operation. It is regulated by controlling the amount of air entering the combustor. The pilot fuel level is the ratio of fuel flow between the main and pilot fuel feed circuits. The main fuel feed is lean pre-mixed and burns with a clean emissions signature. The balance of fuel feed is delivered from the pilot and provides flame stability. During SoLoNO_x operation, pilot fuel flow is reduced to a minimum. The pilot fuel level is continuously monitored during turbine operation. SoLoNO_x operation will be determined during the compliance inspection. More specifics of these parameters will be established based on stack test results.

60.4350(e) requires that “All required fuel flow rate... and ... temperature data must be reduced to hourly averages.”

60.4355 requires that the Permittee shall develop and keep on-site a parameter monitoring plan which explains the procedures used to document proper operation of the NO_x emission controls.

60.4360 requires monitoring of the fuel sulfur content unless exempted under 60.4365, which exempts the fuel monitoring requirement if the fuel used is either tested as or certified as having less than 20 grains of sulfur per 100 cubic feet and not exceeding the potential SO₂ emission rate of 0.060 lb/MMBtu heat input. 60.4365(a) requires a “current, valid purchase contract, tariff sheet or

transportation contract for the fuel, specifying that the maximum total sulfur content... for natural gas ... is 20 grains of sulfur or less per 100 standard cubic feet". A copy of the fuel specification was supplied showing compliance with the NSPS standard (ref. 04/11/18 email from Mike Riley).

Note, the NSPS limit for sulfur in natural gas is 20 grains per 100 ft³ (0.2 gr/ft³). The standard AP-42 factor for sulfur in natural gas is 2000 grains per million ft³ (0.002 gr/ft³) (ref. AP-42 table 1.4-2 (footnote d)).

60.4400 requires initial stack testing for NO_x within 180 days of start-up. In addition, the permittee is required to establish acceptable operating ranges for purposes of the parameter monitoring plan in accordance with 40 CFR 60.4410.

Additionally, 60.4333(a) states, "You must operate and maintain your stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction."

The NSPS Subpart A provisions apply to these new turbines and include the following:

- 60.7(a)(3) notice of initial startup of an affected facility within 15 days after such date (written or electronic)
- 60.7(b) requires maintenance of records of the occurrence and duration of startups, shutdowns, and malfunctions
- 60.7(c) requires an excess emissions and monitoring systems performance report. "Each owner or operator required to install a continuous monitoring device shall submit excess emissions and monitoring systems performance report... All reports shall be postmarked by the 30th day following the end of each six-month period".
- 60.7(f) requires retention of all records, including test reports, for at least 2 years

Compliance with NSPS Subpart KKKK is expected based on statements by the applicant, and will be verified through receipt of required notifications and on-site inspections.

2D .1408 - Stationary Combustion Turbines - Section (a) of this rule states "This Rule applies geographically according to Rule .1402 of this Section." Rule 2D .1402, "Applicability" states "(d) Rules .1407 through .1409(b) and .1413 of this Section apply to facilities with potential emissions of nitrogen oxides equal to or greater than 100 tons per year or 560 pounds per calendar day beginning May 1 through September 30 of any year in the following areas:

- (1) Cabarrus County;
- (2) Gaston County;
- (3) Lincoln County;
- (4) Mecklenburg County;
- (5) Rowan County;
- (6) Union County; and
- (7) Davidson Township and Coddle Creek Township in Iredell County."

The facility will be located in Polk County, which is not one of the areas listed in the rule. Also, the potential emissions as shown below are estimated to be 42.11 tons per year of NO_x.

b. Twelve natural gas-fired catalytic heaters (0.06 MMBtu/hr, each) ID No. ES-4

The catalytic heaters were initially listed as insignificant activities per exemption regulation – 2Q.0102 (h)(1)(B); natural gas combustion sources. However, because the catalytic heaters were included in the Toxics modeling they lose their permit exemption per 2Q .0102(b)(2) and thus they will be included in the permit equipment list as ES-4. They are subject to 2D .0516 and 2D .0521 has listed above. Compliance is expected.

c. Two natural gas-fired fuel gas heaters (0.77 MMBtu/hr, each) ID No. ES-5

The fuel gas heaters were initially listed as insignificant activities per exemption regulation – 2Q.0102 (h)(1)(B); natural gas combustion sources. However, because the fuel gas heaters were included in the Toxics modeling they lose their permit exemption per 2Q .0102(b)(2) and thus they will be included in the permit equipment list as ES-5. They are subject to 2D .0516 and 2D .0521 has listed above. Compliance is expected.

d. One condensate tank (1000-gallon capacity) ID No. ES-6

The condensate tank was initially listed as an insignificant activity per exemption regulation – 2Q.0102 (h)(5); emissions less than 5 tons per year. However, because the condensate tank was included in the Toxics modeling it loses its permit exemption per 2Q .0102(b)(2) and thus it is included in the permit equipment list as ES-6. It is subject to 2D .0521 has listed above. Compliance is expected. Emissions are estimated by the applicant using “E&P TANKS” at 0.67 tpy of VOCs.

e. Insignificant Activities

I-Em. Gen. - one natural-gas fired emergency generator (755 brake horsepower; 500KW)

Exemption regulation – 2Q.0102 (h)(5); potential emissions less than 5 tons per year.

This engine is subject to NSPS Subpart JJJJ and NESHAP Subpart ZZZZ. It is exempt from air permitting requirements under 2Q .0102(h)(5) since each pollutant’s emission potential is less than 5 tons per year.

Although this source is part of the 2D .1100 modeling analysis, it is not added to the permitted equipment list since it is specifically excluded from air toxics permitting under 2Q .0702(a)(27).

2D .0524, NSPS Subpart JJJJ, which has the following requirements:

60.4233(e) requires owners and operators of engines larger than 100 hp meet the emission standards in Table 1 to the Subpart, which limits NO_x to 2.0 g/HP-hr, CO to 4.0 g/HP-hr, and VOC to 1.0 g/HP-hr, for the life of the engine (60.4236).

60.4237(a) requires installation of a non-resettable hour meter if greater than 500 hp, emergency engine built after 7/1/2010 does not meet the standards applicable to non-emergency engines. For this 755 hp engine the emergency emission standards from Table 1 are the same as the non-emergency standards.

60.4243(b) requires either (1) purchase of a certified engine and operation according to manufacturer’s specifications, or (2) **purchase of a non-certified engine and demonstrate compliance with the emission standards through an initial performance test followed up by additional performance tests every 8,760 hours of operation or 3 years, whichever comes first.**

Note, this is not a certified engine and will need to be stack tested (ref. 04/04/2018 email from Mike Riley, the facility’s consultant).

60.4243(d) specifies the amount of non-emergency operation allowed to still be considered an “emergency” engine. 60.4243(d)(1) states that there is no time limit on the use of emergency stationary ICE in emergency situations. 60.4243(d)(2) generally limits non-emergency use for maintenance and various other similar uses to 100 hours per year.

This engine is only for on-site emergency use. It will not be used for demand response (ref. 04/09/2018 email from Mike Riley).

60.4244 specifies test methods. Test methods are detailed in Table 2 of the Subpart.

60.4245(a) requires records be maintained of all notifications, maintenance on the engine, and either certification documentation or stack tests, as applicable.

60.4245(c) requires owners of non-certified engines to submit of a notice of the date of construction (note that 60.7(a)(1) waives this requirement if the item is mass produced and delivered in its completed form) and include the information listed in paragraphs (c)(1) through (c)(5).

60.4245(d) requires submittal of performance tests within 60 days of testing.

60.4245(e) requires submittal of an annual report if the engine is contractually obligated to be available for more than 15 hours of emergency demand response.

60.4246 refers to Table 3 for Subpart A provisions (most are applicable)

Compliance is expected based on the applicant's statements, and will be verified through testing and inspections.

Because the emergency generator is listed as an insignificant activity, the permit only contains a placeholder condition for NSPS, Subpart JJJJ. However, because it is a non-certified engine, stack testing and notification requirements apply.

2D .1111, NESHAP, Subpart ZZZZ, applies to this engine, but has no requirements so long as compliance with the NSPS JJJJ standard is maintained. Because the emergency generator is listed as an insignificant activity, the permit only contains a placeholder condition for NESHAP, Subpart ZZZZ.

I-Fugitives - fugitive equipment leaks

Exemption regulation – 2Q.0102 (h)(5); potential emissions less than 5 tons per year. There are no modeled emissions from the fugitive equipment leaks.

I-Blow Down - compressor blow down fugitive emissions

Exemption regulation – 2Q.0102 (h)(5); potential emissions less than 5 tons per year. There are no modeled emissions from the blow downs.

f. **Facility Wide**

2D .0524 - NSPS, Subpart OOOO and OOOOa

NSPS, Subpart OOOO applies to natural gas compressor operations from the wellhead to the point of custody transfer (defined as post processing and treatment of the gas) of the marketable gas, and storage vessels with greater than 6 tpy VOC emissions. This compressor station is located after custody transfer, and no tanks will emit over 6 tpy VOC, therefore, this facility is not subject to this rule. On August 18, 2015 the EPA proposed revisions to this rule called **NSPS Subpart OOOOa**, which regulate methane and VOC emissions not currently covered by Subpart OOOO. On August 2, 2016, this rule became effective and applies to equipment constructed after September 18, 2015.

NSPS, Subpart OOOOa applicability to the proposed facility is described in 60.5365a as follows:

- each well affected facility [60.5365a(a)] – there are no wells associated with this compressor station.
- each centrifugal compressor using wet seals [60.5365a(b)] – all 3 centrifugal compressors will use dry seals so they are not subject to this rule.
- each reciprocating compressor [60.5365a(c)] – none of the compressors are reciprocating.
- each pneumatic controller affected facility which is a single continuous bleed natural gas-driven pneumatic controller. [60.5365a(d)] – there will not be any pneumatic controllers.
- each storage vessel with potential VOC emissions in excess of 6 tpy [60.5365(e)] – each storage vessel has potential VOC emissions less than this threshold, thus they are not subject to this rule.
- all equipment within a “process unit” [60.5365a(f)] – this applies to equipment used to remove natural gas liquids from field gas, which will not be done at this site.
- each sweetening unit [60.5365a(g)] – no sweetening (i.e. removal of H₂S or CO₂) occurs at this facility.
- each pneumatic pump [60.5365a(h)] – this facility does not use pneumatic pumps.
- The collection of fugitive emission sources at a well [60.5365a(i)] – there is no well associated with this facility.
- the collection of fugitive emissions components at compressor stations is an affected facility [60.5365a(j)] – this is a “compressor station,” as defined in 60.5430a, and the fugitive emissions are subject to this rule. **These are the only sources at the facility with requirements under this rule.** The sources are estimated to be 26 valves, 122 connections, 2 open-ended lines and 1 pressure relief valve and the 3 turbines.

60.5370a requires compliance be achieved upon startup [60.5370a(a)], and at all times (including startup, shutdown, and malfunction – note that the provisions of 40 CFR 60.8(c) do not apply [60.5370a(b)]) the owners and operators shall maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions [60.5370a(b)].

60.5397a describes fugitive emission standards at a compressor station for the reduction of GHG (as methane) and VOC as follows:

- 60.5397a(a) defines fugitive emissions as: Any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using Method 21.
- 60.5397a(b) requires development of an air emissions monitoring plan.
- 60.5397a(c) specifies the 8 elements of a fugitive emissions monitoring plan.
- 60.5397a(d) specifies the 4 more elements of a fugitive emissions monitoring plan.
- 60.5397a(e) requires each monitoring survey observe each fugitive emissions component for fugitive emissions.
- 60.5397a(f)(2) requires an initial monitoring survey be conducted within 60 days of startup of a compressor station.
- 60.5397a(g)(2) requires a monitoring survey of the collection of fugitive emissions at a compressor station be conducted at least quarterly after the initial survey. Consecutive quarterly surveys must be conducted at least 60 days apart. 60.5397a(g)(3) and (4) describe how to handle “difficult-to-monitor” and “unsafe-to-monitor” emissions, respectively.
- 60.5397a(h)(1) requires each identified source of fugitive emissions be repaired or replaced no later than 30 days after discovery unless the repair qualifies under 60.5397a(h)(2) as either technically infeasible, would require a vent blowdown or compressor station shutdown, or would be unsafe to repair during operation of the unit. In these cases, the repair must be made during the next compressor station shutdown or within 2 years, whichever is earlier. 60.5397a(h)(3) requires each repaired component be resurveyed for fugitive emissions within 30 days after being repaired. Subparagraphs (i) through (iii) require a resurvey within 30 days of discovery of the fugitive

emission using either Method 21 or optical gas imaging, and digital documentation of any fugitive emission that can't be repaired during the monitoring survey when discovered.

- 60.5397a(i) requires records of each monitoring survey be maintained as specified in 60.5420a(c)(15).
- 60.5397a(j) requires an annual report to include information specified in 60.5420a(b)(7).

60.5398a describes procedures to allow for alternative means of emission limitation as approved by the Administrator.

60.5410a(j) describes the procedures for demonstrating initial compliance with this rule.

60.5415a(h) describes the requirements to demonstrate continuous compliance.

60.5420a describes the notification, reporting and recordkeeping requirements. It also states that 60.7(a)(1), (2), and (3) do not apply.

Because the fugitive equipment leaks are listed as an insignificant activity, the permit will only contain a placeholder for NSPS, Subpart OOOOa.

2D .0535 - Excess Emissions Reporting and Malfunctions

This regulation requires timely reporting and appropriate actions during periods of excess emissions and malfunctions. Compliance with 2D .0535 is expected and will be evaluated once the facility is operational.

2D 0540 - Particulates from Fugitive Non-process Dust Emission Sources

The facility is required to control non-process fugitive dust emissions such that no substantive complaints are received by this office (dust traveling off-site). Compliance with this regulation is expected and will be evaluated once the facility is operational.

Toxics – 2D .1100 (Modeling)

The initial permit application stated the facility to be exempt from the air toxics rules under 2Q .0702(a)(25) since the reported facility-wide benzene emissions all come from natural gas-fired equipment with a total heat input less than 450 mmBtu/hr. However, emissions from the condensate storage tank were recalculated using the E&P TANKS program. Benzene emissions were reported at 5.2 pounds per year (0.00059 lb/hr). Because this is a non-combustion benzene source the exemption does not apply and the applicant submitted an air toxics evaluation. Benzene, formaldehyde, acrolein and 1,3-butadiene emissions were modeled to demonstrate compliance with the 2D .1100 AALs. Nancy Jones, AQAB, reviewed this modeling analysis and approved the results in a memo dated March 27, 2018, which shows compliance with the AALs as follows.

TAP	Averaging Period	Max. Conc. (µg/m³)	AAL (µg/m³)	% of AAL
Benzene	Annual	0.047	0.12	39 %
Formaldehyde	1-hour	36.2	150	24 %
1,3-Butadiene*	Annual	0.00016	0.44	<1 %
Acrolein	1-hour	3.51	80	4 %

* The emissions of 1,3-butadiene do not exceed the TPER limit as shown below in this review. The facility miscalculated the emissions from the emergency generator by using 8760 hours of operation instead of 500 hours of operation. This pollutant will only be listed in the condition for 2Q .0711 for toxic pollutant emissions not exceeding the TPER limits.

Since the modeling was conducted at the worst case expected operations (at potential emissions), no operational restrictions are necessary to demonstrate ongoing compliance with the AALs for the modeled emission rates. Note that the emergency generator is an insignificant emission source which

has an applicable NESHAP and is exempt from toxics per 2Q .0702(a)(27). Thus, emissions from this source will not be listed in the permitted table. The modeled emissions rates for the permitted sources shown in the following table will be listed in a 2D .1100 permit condition.

Source	Benzene	Formaldehyde	Acrolein
	(lb/hr)	(lb/hr)	(lb/hr)
Compressor ES-1	0.000614 (5.38 lb/yr)	0.0365	0.000327
Compressor ES-2	0.000614 (5.38 lb/yr)	0.0365	0.000327
Compressor ES-3	0.000614 (5.38 lb/yr)	0.0365	0.000327
Catalytic Heaters ES-4	0.0000149 (0.013 lb/yr)	0.0000533	1.27x10-8
Fuel Heaters ES-5	0.0000317 (0.028 lb/yr)	0.000113	2.72x10-8
Condensate Tank ES-6	0.000594 (5.203 lb/yr)		
Emergency Generator I-Em. Gen	0.000150 (1.314 lb/yr)	0.315	0.0306

2D .1806 - Control and Prohibition of Odorous Emissions

This regulation prohibits odorous emissions without employing suitable measures for their control. Since natural gas has an odor added for safety purposes, the odor regulation is included in the permit. Compliance with this regulation is expected and will be evaluated once the facility is operational.

2Q .0113 - Notification in Areas Without Zoning

On 12/28/2017, ARO received a Zoning Consistency Determination for this application from Ms. Cathy Ruth, Polk County Planner stating that there are no applicable zoning ordinances in Polk County. Because there is no zoning for this site, the facility must comply with the public notification requirements of 2Q .0113. The application included an Affidavit of Publication for the Tryon Daily Bulletin on 11/14/2017 for the proposed PSNC site in Polk County. On 12/13/2017 Mr. Bob Graves and Mr. Richard Morris of the DAQ sited the site to observe the public notification sign. Pictures were taken of the sign. The requirements of 2Q .0113 appear to have been met.

2Q .0711 – Toxics (TPERs)

The following facility-wide toxic air pollutants (TAPs) which did not exceed their TPERs will be listed in a 2Q .0711 permit condition. TPERs for obstructed or non-vertical stacks are listed in the table below and are listed in the permit. See 04/09/2018 email from Mike Riley as a correction to Table 9 of the application.

* The emissions of 1,3-butadiene were modeled; but, after recalculation, emissions do not exceed the TPER limit. The facility miscalculated the emissions from the emergency generator by using 8760 hours of operation instead of 500 hours of operation. This pollutant will only be listed in the condition for 2Q .0711 for toxic pollutant emissions not exceeding the TPER limits.

** The majority daily n-hexane emissions are from facility blowdowns. Annual n-hexane emissions from the blowdowns are listed at 20 pounds per year. The application lists daily n-hexane emissions from blowdowns at 7.36 pounds per day (and 7.36 pounds per hour). Daily n-hexane emissions from all other sources at the facility total 0.441 pounds per day. Even if all blowdown emissions were to occur in one day, facility wide daily n-hexane emissions would be 20.441 pounds per day. This is less than the worst case obstructed/non-vertical TPER of 23 pounds per day.

*** These pollutants are only emitted from the emergency generator and will not be included in the condition for 2Q .0711.

Pollutant	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)	Actual Emission Rate
Acetaldehyde (75-07-0)				6.8	0.00617 lb/hr
Ammonia (as NH3) (7664-41-7)				0.68	0.00709 lb/hr
Benzo(a)pyrene (Component of 83329/POMTV & 56553/7PAH) (50-32-8)	2.2				0.00002 lb/yr
1,3-butadiene (106-99-0)	11				1.373 lb/yr *
Carbon tetrachloride*** (56-23-5)	460				1.9 lb/yr
Chlorobenzene*** (108-90-7)		46			0.00436 lb/day
Chloroform*** (67-66-3)	290				1.5 lb/yr
Ethylene dibromide*** (dibromoethane) (106-93-4)	27				2.3 lb/yr
n-hexane (110-54-3)		23			7.801 lb/day **
Methylene chloride*** (75-09-2)	1600		0.39		1.0 lb/yr and 0.000119 lb/hr
Phenol (108-95-2)***			0.24		0.000143 lb/hr
Styrene*** (100-42-5)			2.7		0.000141 lb/hr
Tetrachloroethane, 1,1,2,2-*** (79-34-5)	430				2.4 lb/yr
Toluene (108-88-3)		98		14.4	0.559 lb/day and 0.0233 lb/hr
Vinyl chloride*** (75-01-4)	26				0.8 lb/yr
Xylene (mixed isomers) (1330-20-7)		57		16.4	0.263 lb/day and 0.0109 lb/hr

Environmental Justice Review

In accordance with the “Memorandum of Understanding on Environmental Justice and Executive Order 12898”, the EPA is required to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

Based on the determination from Ms. Renee Kramer, Compliance Officer with the NC Division of Waste Management, Solid Waste Section, dated February 21, 2018 (see attached), there does not appear to be a low-income community of concern within a 1-mile radius of the proposed facility and only 13% of the population within a 1-mile radius are minority.

Therefore, there does not appear to be any environmental justice concerns for this facility.

5. NSPS, NESHAPS, PSD, Toxics, 112(r) and Attainment Status:

NSPS, Subpart KKKK applies to the turbines, as discussed above.

NSPS, Subpart JJJJ applies to the emergency generator as discussed above. Because the emergency generator is listed as an insignificant activity, the permit only contains a placeholder condition.

NSPS, Subpart OOOOa applies to the natural gas compressor operation fugitive emissions as discussed above. Because the fugitive emissions are listed as an insignificant activity, the permit only contains a placeholder condition.

NESHAPS, Subpart ZZZZ is applicable to the emergency generator, as discussed above, but has no requirements so long as compliance with the NSPS JJJJ standard is maintained. Because the emergency generator is listed as an insignificant activity, the permit only contains a placeholder condition.

PSD - This facility is a PSD minor source since no criteria pollutant potential emissions exceed 250 tons per year.

112(r) - The Permittee has indicated in the application that they are not subject to the requirements of 112(r).

6. Facility Compliance Status

This is a greenfield facility with no compliance history.

7. Facility Emissions Review

Based on the potential emissions shown below, this facility is classified as small with the issuance of this permit. The facility's permit application lists expected actual emissions to be equal to potential emissions.

Facility Emissions Summary

Pollutant	Emissions
	Potential = Expected Actual (tpy)
TSP	4.44
PM-10	4.44
PM-2.5	4.44
SO ₂	0.43
NO _x	42.11
VOC	4.73
CO	42.08
Largest HAP (Formaldehyde)	1113.05 lb/yr
Total HAP	1734.08 lb/yr

- a. **Three natural gas-fired compressor turbine sets (6,043 Hp output; 51.13 MMBtu/hr maximum heat input rate, each) ID Nos. ES-1, ES-2 and ES-3**

Emissions from the turbines are referenced as listed in the application and are based on EPA's AP-42, Section 3.1. SO₂ emissions are based on EPA's AP-42, Section 1.4 (based on a standard 2000 grains of sulfur per million cubic feet). CO and NO_x are based on manufacturer's data.

Pollutant	Emissions
	Potential = Expected Actual (tpy)
TSP	4.43
PM-10	4.43
PM-2.5	4.43
SO ₂	0.43
NO _x	40.31
VOC	1.41
CO	40.98
Largest HAP (Formaldehyde)	954 lb/yr
Total HAP	1380 lb/yr

b. **I-Em. Gen. - one natural-gas fired emergency generator (755 brake horsepower; 500KW)**

Emissions from the emergency generator are referenced as listed in the application. Emissions of NO_x, VOC, and CO are estimated by using manufacturer's data, and PM/PM-10/PM-2.5 and SO₂ by using AP-42, for 500 hours per year as shown below.

Pollutant	Emissions
	Potential = Expected Actual (tpy)
TSP	0.01
PM-10	0.01
PM-2.5	0.01
SO ₂	0.001
NO _x	0.83
VOC	0.42
CO	0.80
Largest HAP (Formaldehyde)	157.6 lb/yr
Total HAP	216 lb/yr

c. **Twelve natural gas-fired catalytic heaters (0.06 MMBtu/hr, each) ID No. ES-4**

The catalytic heaters have a total heat input rate of 0.72 MMBtu/hr. Emissions are based on the attached DAQ natural gas combustion spreadsheet.

Pollutant	Emissions
	Potential = Expected Actual (tpy)
TSP	0
PM-10	0
PM-2.5	0
SO ₂	0
NO _x	0.31
VOC	0.02
CO	0.26
Largest HAP (Hexane)	11.1 lb/yr
Total HAP	11.6 lb/yr

d. **Two natural gas-fired fuel gas heaters (0.77 MMBtu/hr, each) ID No. ES-5**

The fuel heaters have a total heat input rate of 1.54 MMBtu/hr. Emissions are based on the attached DAQ natural gas combustion spreadsheet.

Pollutant	Emissions	
	Potential	Expected Actual (tpy)
TSP	0	
PM-10	0	
PM-2.5	0	
SO ₂	0	
NO _x	0.66	
VOC	0.56	
CO	0.04	
Largest HAP (Hexane)	23.8 lb/yr	
Total HAP	24.9 lb/yr	

e. **I-Fugitives - fugitive equipment leaks**

Pipeline leaks occur at the various flanges, valves, compressors and monitoring equipment in all parts of the facility. The applicant used 40 CFR 98, Subpart W, Table W-1A “Default Whole Gas Emission Factors...” to calculate fugitive emissions from piping leaks. The facility used a 0.008% HAP component of the natural gas based on sampling results taken at their Gastonia facility. All HAPs are counted as hexane. Because facility wide hexane emissions are below the TPER, and thus not included in the modeling, the fugitive equipment leaks are listed as an insignificant activity.

Pollutant	Emissions	
	Potential	Expected Actual (tpy)
VOC	0.07	
Total HAP (Hexane)	22 lb/yr	

f. **I-Blow Down - compressor blow down fugitive emissions**

“Blowdowns” are an operating condition where pressure is relieved in the gas line or other equipment by venting the natural gas to the atmosphere. This is usually done in order to conduct maintenance on the line or turbines (when the flammable gas must be removed first), and is later followed by a “purge” using natural gas in order to remove any oxygen in the line from the maintenance activity (air is removed to prevent a flammable mixture of gas and oxygen). Other emergency or upset conditions (such as pipe rupture, gas detected in compressor buildings, etc.) may occur that require a similar blowdown and purge. Emissions are calculated on a mass balance basis by the applicant assuming one full site-wide blowdown per year. It is noted that blowdowns of this type generally occur about every 5 years. A volume of 1,218,658 standard cubic feet of gas was used in the calculations per blowdown.

Pollutant	Emissions	
	Potential	Expected Actual (tpy)
VOC	1.58	
Total HAP (Hexane)	20 lb/yr	

g. **One condensate tank (1000 gallon capacity) ID No. ES-6**

The condensate tank emissions were calculated using the E and P Tanks Program, A11. A tank volume of 1000 gallons and an annual throughput of 4000 gallons per year were used in the calculations.

Pollutant	Emissions
	Potential = Expected Actual (tpy)
VOC	0.67
Largest HAP (Hexane)	46.3 lb/yr
Total HAP	59.58 lb/yr

8. Stipulation Review

N/A. This is a greenfield facility.

9. Conclusions, Comments, and Recommendations:

I checked the NC Secretary of State Webpage on March 6, 2018 and verified that Public Service Company of North Carolina, Inc. is registered as a North Carolina corporate entity (see attached). ARO will issue Air Permit No. 10562R00 to Public Service Company of North Carolina, Inc., Mill Spring Compressor Station, Silver Creek Road, Polk County, North Carolina.