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December 20, 2022

Muhammad Q. Zaman
Regional Air Quality Program Manager
PADEP Northcentral Regional Office
208 West Third Street, Suite 101
Williamsport, PA 17701-6448

Subject: Title V Significant Modification for RACT III Incorporation, 25 PA Code §129.115(d)(1) Waiver Request, and 25 PA Code §129.114 Alternative RACT Emission Limit Proposal
Compressor Station 520
Mifflin Township, Lycoming County, Pennsylvania
Transcontinental Gas Pipe Line Company, LLC

Dear Mr. Zaman:

Pursuant to 25 *Pa. Code* §127.465, Transcontinental Gas Pipe Line Company, LLC (Transco) is submitting this Title V Significant Modification Application to the Pennsylvania Department of Environmental Protection (PADEP) to incorporate updated Reasonably Available Control Technology (RACT) requirements as promulgated in Pennsylvania Code, Title 25, Chapters 121 and 129. In addition, this application requests a waiver of the initial compliance demonstration in accordance with 25 Pa. Code §129.115(d)(1) to use prior Department-approved stack test results. Finally, this application proposes that compliance with the alternative RACT emission limit, approved by the Department under 129.99(e) under RACT II, also demonstrates RACT III compliance, under §129.112(a) – (c) and (e) – (h), and revalidates that alternative RACT limit.

This Title V Significant Modification is for the incorporation of new presumptive RACT requirements (RACT III) and to request minor changes to permit conditions. This application does not involve the installation or modification of air contamination sources or other equipment.

In accordance with the requirements of 25 *Pa. Code* §127.413, Transco has notified the County, Municipality, neighboring states, and EPA regarding this Title V Significant Modification Application. Copies of the corresponding notifications are included with this Title V Significant Modification Application.

If you have any questions regarding this submittal or require additional information, please feel free to contact me at (609) 285-2407 or by email at Michael.Hahn@williams.com.

Sincerely,

Michael Hahn
Environmental Specialist V

RACT III Notification, Waiver Request, and Alternative RACT Proposal Revalidation

Transco Compressor Station 520

20 December 2022

Project No.: 0638802

The business of sustainability

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1. INTRODUCTION

Transcontinental Gas Pipe Line Company, LLC (Transco) owns and operates an interstate natural gas pipeline transmission system extending from Texas to the Northeast United States. The Transco system is regulated at the federal level by the Federal Energy Regulatory Commission (FERC) under the Natural Gas Act, and by the U.S. Department of Transportation ("DOT") under the Natural Gas Pipeline Safety Act.

Located in Mifflin Township, Lycoming County, Pennsylvania, Transco Station 520 is a compressor station driven by natural gas-fired reciprocating internal combustion engines (RICE), turbines, emergency generators, and other combustion units. The facility currently operates under Title V Operating Permit No. TVOP-41-00001, which was issued by the Pennsylvania Department of Environmental Protection (PADEP), in accordance with the provisions of the Title 25 Pennsylvania Code Chapter 127 (25 Pa. Code §127), on May 5, 2020.

The Station is located in the Pennsylvania Department of Environmental Protection's (PADEP's) Northcentral Region and has a potential to emit (PTE) greater than 50 tons per year (TPY) of volatile organic compounds (VOC) and 100 tons per year of oxides of nitrogen (NOx). As such, the Station is subject to updated reasonably available control technology (RACT III) requirements as promulgated in Pennsylvania Code, Title 25, Chapters 121 and 129.

This RACT III analysis and compliance plan complies with the specific requirements listed in 25 PA Code §129.111 through §129.115. The analysis provides a list of sources subject to the RACT requirements, identifying information, the RACT category (exempt, presumptive, or case-by-case) for applicable sources, estimates of potential and actual NOx and VOC emissions, RACT analysis, and methods to demonstrate compliance including testing, monitoring, recordkeeping, and reporting procedures.

1.1 Site Description

Station 520 is a natural gas compressor station used to maintain the continuous flow of natural gas in the Transco pipeline. Compressor stations are "pumping" facilities that advance the flow of natural gas. The station consists of natural gas-fired RICE, auxiliary generators, a boiler, and other equipment.

1.2 Source Identification

A listing and physical description of each affected NOx and VOC source located at Station 520 is provided in this section. **Table 1** presents source specific information such as capacity, fuel/material, and source type.

Table 1: RACT Source Detail

Source ID	Source	Permitted Capacity	Fuel/Material	Source Type
P101	Ingersoll-Rand 412-KVS	2,050 BHP	Natural Gas	Lean Burn ICE
		15.90 MCF/hr		
P102	Ingersoll-Rand 412-KVS	2,050 BHP		
		15.90 MCF/hr		
P103	Ingersoll-Rand 412-KVS	2,050 BHP		

Source ID	Source	Permitted Capacity	Fuel/Material	Source Type
		15.90 MCF/hr		
P104	Ingersoll-Rand 412-KVS	2,050 BHP		
		15.90 MCF/hr		
P105	Ingersoll-Rand 412-KVS	2,050 BHP		
		15.90 MCF/hr		
P106	Solar Mars 90	12,600 BHP	Natural Gas	Combustion Turbine
		105.10 MCF/hr		
P107	Solar Mars 90	12,600 BHP		
		105.10 MCF/hr		
P116	Solar Titan 130S w/ Oxidation Catalyst	20,500 BHP		
		165.18 MCF/hr		
P110	Waukesha 2895 GL Emergency Generator	607 BHP	Natural Gas	Lean Burn ICE
		5.20 MCF/hr		
P117	GE Waukesha P48GL Emergency Generator	1,065 BHP		
		8.10 MCF/hr		
036	Cyclotherm Boiler 2800-L-N	3.8 MCF/hr	Natural Gas	Industrial Boiler
037	Space Heaters (15)	Various	Natural Gas	Combustion Unit
P109	Fugitive Piping and Venting	N/A	Natural Gas	Fugitive
BLO	Blowdown/Venting	N/A	Natural Gas	Fugitive
P112	Parts Washer	35 gal.	VOC Degreaser	Parts Washer
P114	Storage Tanks (5) > 2,000 gal	> 2,000 gal	VOC	Storage Tank

1.3 Summary of VOC RACT Analysis

The RACT III rule includes provisions for exemptions, presumptive, and case-by-case RACT emission limitations / requirements. The RACT III VOC source categories relevant to Station 520 include:

- Sources with a potential to emit less than 1 ton per year of VOC are exempt from RACT III.
- Lean burn stationary internal combustion engines with a rating equal to or greater than 500 bhp and less than 3,500 bhp are subject to presumptive RACT emission limitations.
- Simple cycle or regenerative cycle combustion turbines with a rated output equal to or greater than 4,100 BHP and less than 60,000 BHP are subject to presumptive RACT emission limitations.

The detailed VOC RACT analysis for Station 520 is contained Section 2. The analysis provides an estimate of potential and baseline emissions, a listing of each of the VOC sources subject to presumptive or case-by-case RACT III requirements, and proposed compliance demonstrations.

Table 2 presents a summary of the VOC RACT III analysis for each source as presented in Section 2. The table lists the VOC RACT category, proposed RACT III requirements, and the proposed compliance demonstration.

Table 2: VOC RACT III Update Summary

Source ID	Source	VOC RACT Category	VOC RACT Proposed Requirements	Compliance Demonstration
P101	Ingersoll-Rand 412-KVS	Presumptive	Limit VOC <= 0.5 gram VOC/bhp-hr excluding formaldehyde. §129.112(g)(3)(i)(B).	Conduct stack testing and maintain record of compliance with emission rate limitation.
P102	Ingersoll-Rand 412-KVS			
P103	Ingersoll-Rand 412-KVS			
P104	Ingersoll-Rand 412-KVS			
P105	Ingersoll-Rand 412-KVS			
P106	Solar Mars 90	Presumptive	Limit VOC <= 9 ppmvd VOC (as propane) @ 15% oxygen. §129.112(g)(2)(V)(B)	Conduct stack testing and maintain record of compliance with emission rate limitation.
P107	Solar Mars 90			
P116	Solar Titan 130S w/ Oxidation Catalyst			
P110	Waukesha 2895 GL Emergency Generator	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
P117	GE Waukesha P48GL Emergency Generator	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
036	Cyclotherm Boiler 2800-L-N	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
037	Space Heaters (15)	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
P109	Fugitive Piping and Venting	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
P112	Parts Washer	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).
P114	Storage Tanks (5) > 2,000 gal	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with 129.115(h).

1.4 Summary of NOx RACT analysis

The Pennsylvania RACT III rule includes provisions for exemptions, presumptive, and case-by-case RACT emission limitations. The RACT III NOx source categories relevant to Station 520 include:

- Sources with a potential to emit less than 1 ton per year of NOx are exempt from RACT III.
- Lean burn stationary internal combustion engines with a rating equal to or greater than 500 bhp and less than 3,500 bhp are subject to presumptive RACT emission limitations.
- Simple cycle combustion turbines with a rated output equal to or greater than 4,100 BHP, and less than 60,000 BHP, fired by natural gas are subject to presumptive NOx RACT III emissions limitations.
- Emergency standby engines that operate less than 500 hours in a 12-month rolling period are subject to presumptive RACT III requirements.
- NOx air contamination sources, subject to §129.111, that have the potential to emit less than 5.0 TPY of NOx are subject to presumptive RACT emission limitations.

The detailed NOx RACT analysis for the Station is contained in Section 3. The analysis provides an estimate of potential and baseline emissions, a listing of each of the NOx sources applicable to presumptive or case-by-case RACT III requirements, and proposed compliance demonstrations. If a source does not have or cannot meet the applicable presumptive requirements listed in 25 PA Code §129.112, then a case-by-case analysis is provided.

Table 3 presents a summary of the RACT III analysis for each source as presented in Section 3. The table lists the NOx RACT Category, proposed NOx RACT III requirements, and the proposed compliance demonstration.

Table 3: NOx RACT III Update Summary

Source ID	Source	NOx RACT Category	NOx RACT Proposed Requirements	Compliance Demonstration
P101	Ingersoll-Rand 412-KVS	Presumptive	Limit NOx <= 3.0 gram NOx/bhp-hr. §129.112(g)(2)(i)(A)	Conduct stack testing and maintain record of compliance with emission rate limitation
P102	Ingersoll-Rand 412-KVS			
P103	Ingersoll-Rand 412-KVS			
P104	Ingersoll-Rand 412-KVS			
P105	Ingersoll-Rand 412-KVS			
P106	Solar Mars 90	Case-by-case	§129.99(e) Compliance Demonstration Analysis §129.114(i)	Conduct stack testing and maintain record of compliance with emission rate limitation
P107	Solar Mars 90			
P116	Solar Titan 130S w/ Oxidation Catalyst	Presumptive	Limit NOx <= 42 ppmvd NOx @ 15% oxygen. §129.112(g)(2)(V)(A)	Conduct stack testing and maintain record of compliance with emission rate limitation.
P110	Waukesha 2895 GL Emergency Generator	Presumptive	Operate according to manufacturer specifications and good operating practices. §129.112(c)(10)	Maintain records according to §129.115(f).

Source ID	Source	NOx RACT Category	NOx RACT Proposed Requirements	Compliance Demonstration
P117	GE Waukesha P48GL Emergency Generator	Presumptive	Operate according to manufacturer specifications and good operating practices. §129.112(c)(10)	Maintain records according to §129.115(f).
036	Cyclotherm Boiler 2800-L-N	Presumptive	Operate according to manufacturer specifications and good operating practices. §129.112(c)(4)	Maintain records according to §129.115(f).
037	Space Heaters (15)	Exempt	PTE VOC less than 1 TPY. §129.111(c)	Maintain records in accordance with §129.115(h).

2. VOC RACT III ANALYSIS

This section provides an estimate of potential and baseline VOC emission, a listing of each of the VOC sources applicable to presumptive RACT III requirements, and proposed compliance demonstrations.

2.1 Estimate of Potential and Actual VOC Emissions

As required by 25 PA Code §129.92(a)(4), **Table 4** provides the estimated potential and baseline actual VOC emissions at Station 520. This section describes the methods used to calculate potential and baseline actual VOC emissions for the sources.

The estimated PTE for VOC sources are based on the current permitted potential emissions for each source, which is established in the current TVOP 41-00001.

The baseline emissions for engines (Source IDs P101 through P105) and turbines (Source IDs P106, P107, and P116) are based on historical operating hours and stack test results.

The baseline actual VOC emissions from the boiler (Source ID 036), auxiliary generators (Source IDs P110 and P117) and Space Heaters (Source ID 037) are based on historical operating data and UP EPA AP-42 Emission Factors.

The potential and baseline VOC emissions from Source ID P109 – Fugitive Emissions from Piping and Venting are based on emission factors from Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) Tabled 2.4, Oil and Gas Production Operations.

The baseline emissions for parts washer (Source ID P112) and storage tanks (Source ID P114) are based on material throughput.

Table 4: Baseline, Actual, and Potential VOC Emissions

Source ID	Source Name	VOC Emission Factor	Reference	Baseline Year	Capacity	Baseline Actual VOC Emissions (TPY)	Potential Capacity	Potential VOC Emissions (TPY)
P101	Ingersoll-Rand 412-KVS	2.50 lb/hr	Stack Test	2021	Hours of Operation	1.45	15.90 MCF/hr	10.95
P102	Ingersoll-Rand 412-KVS	2.50 lb/hr	Stack Test	2021	Hours of Operation	0.78	15.90 MCF/hr	10.95
P103	Ingersoll-Rand 412-KVS	2.50 lb/hr	Stack Test	2021	Hours of Operation	1.27	15.90 MCF/hr	10.95
P104	Ingersoll-Rand 412-KVS	2.50 lb/hr	Stack Test	2021	Hours of Operation	0.77	15.90 MCF/hr	10.95
P105	Ingersoll-Rand 412-KVS	2.50 lb/hr	Stack Test	2021	Hours of Operation	0.56	15.90 MCF/hr	10.95
P106	Solar Mars 90	1.60 lb/hr	Stack Test	2021	Hours of Operation	0.0031	112.80 MCF/hr	1.92
P107	Solar Mars 90	1.60 lb/hr	Stack Test	2021	Hours of Operation	0.0028	112.80 MCF/hr	2.69
P116	Solar Titan 130S w/ Oxidation Catalyst	0.61 lb/hr	Stack Test	2021	Hours of Operation	0.16	165.18 MCF/hr	2.70
P110	Waukesha 2895 GL Emergency Generator	0.12 lb/MMBtu	AP-42	2021	Hours of Operation	0.0074	5.20 MCF/hr	0.14
P117	GE Waukesha P48GL Emergency Generator	0.04 g/bhp-hr	AP-42	2021	Hours of Operation	0.0105	8.10 MCF/hr	0.02
036	Cyclotherm Boiler 2800-L-N	5.50 lb/MMscf	AP-42	2021	Hours of Operation	0.042	3.8 MCF/hr	0.09
037	Space Heaters (15)	5.50 lb/MMscf	AP-42	2021	Hours of Operation	< 1	1.9 MCF/hr	0.02
P109	Fugitive Piping and Venting	Varies by component	Emission Factors	2021	N/A	0.07	N/A	0.13
BLO	Blowdowns/Venting	N/A	N/A	2021	N/A	0.11	N/A	0.82
P112	Parts Washer	N/A	N/A	2021	Material Throughput	< 1	35 gal.	0.12
P114	Storage Tanks (5) > 2,000 gal	N/A	N/A	2021	Material Throughput	< 1	>2,000 gal	0.23

2.2 VOC RACT III Source Applicability

This section provides the detailed RACT analysis for affected VOC sources. The sources are identified as exempt or subject to presumptive requirements.

2.2.1 Exempt VOC RACT III Sources

VOC sources that were in existence on or after August 3, 2018, with a potential to emit less than 1 TPY, are classified as exempt sources per 25 PA Code §129.111(c) and summarized in **Table 5**.

Table 5: Exempt VOC RACT Sources

Source ID	Source	Permitted Capacity	Potential VOC Emissions (TPY)	Exempt RACT Category	RACT Citation
P110	Waukesha 2895 GL Emergency Generator	607 bhp	0.14	PTE < 1 TPY	§129.111(c)
P117	GE Waukesha P48GL Emergency Generator	1,065 bhp	0.02	PTE < 1 TPY	§129.111(c)
036	Cyclotherm Boiler 2800-L-N	3.5 MMbtu/hr	0.09	PTE < 1 TPY	§129.111(c)
037	Space Heaters (15)	1.7 MMbtu/hr	0.02	PTE < 1 TPY	§129.111(c)
P109	Fugitive Piping and Venting	N/A	0.13	PTE < 1 TPY	§129.111(c)
BLO	Blowdown/Venting	N/A	0.82	PTE < 1 TPY	§129.111(c)
P112	Parts Washer	35 gal.	0.12	PTE < 1 TPY	§129.111(c)
P114	Storage Tanks (5) > 2,000 gal	>2,000 gal.	0.23	PTE < 1 TPY	§129.111(c)

2.2.2 Presumptive VOC RACT III Sources

Presumptive VOC RACT III sources include VOC sources which have a PTE greater than or equal to 1 TPY, but less than 2.7 TPY. Additionally, 25 PA Code §129.112 sets presumptive requirements for various types and sizes of sources.

- Lean burn stationary internal combustion engines with a rating equal to or greater than 500 bhp and less than 3,500 bhp fired by natural gas can comply with the presumptive VOC RACT III emission limit of 0.5 gram VOC/bhp-hr excluding formaldehyde (§129.112(g)(3)(i)(B)).
- Simple Cycle combustion turbines with a rated output equal to or greater than 4,100 BHP, and less than 60,000 BHP, fired by natural gas can comply with the presumptive NOx RACT III emissions limitations of 9 ppmvd VOC (as propane) at 15% oxygen (§129.112(g)(2)(v)(B)).

Table 6 presents a list of the presumptive sources at Station 520.

Table 6: Presumptive VOC RACT III Sources

Source ID	Equipment	Permitted Capacity	Presumptive RACT Category	RACT Citation
P101	Ingersoll-Rand 412-KVS	2,050 bhp	Lean Burn RICE (>= 500 bhp & < 3,500 bhp)	§129.112(g)(3)
P102	Ingersoll-Rand 412-KVS	2,050 bhp		
P103	Ingersoll-Rand 412-KVS	2,050 bhp		
P104	Ingersoll-Rand 412-KVS	2,050 bhp		
P105	Ingersoll-Rand 412-KVS	2,050 bhp		
P106	Solar Mars 90	12,600 bhp	Simple Cycle Combustion Turbine (> 4,100 bhp & < 60,000 bhp)	129.112(g)(2)
P107	Solar Mars 90	12,600 bhp		
P116	Solar Titan 130S w/ Oxidation Catalyst	20,500 bhp		

2.2.3 Case-by-case VOC RACT Sources

A case-by-case RACT analysis must be performed for VOC sources that are not classified as exempt or Presumptive VOC RACT sources. There are no VOC sources at Station 520 that are case-by-case since all equipment is classified as exempt or Presumptive VOC RACT III sources.

2.3 VOC RACT III Compliance Demonstration

The following sections detail the various VOC RACT III sources (exempt, presumptive, or case-by-case) and the requirements for Station 520 to demonstrate compliance with RACT. **Table 7** outlines the VOC RACT sources, VOC RACT category, RACT requirement, and RACT compliance demonstration.

2.3.1 Exempt VOC Sources

Table 7 summarizes the exempt VOC RACT III sources at the site. As required by 25 PA Code §129.115(f), Transco will maintain records at the facility to demonstrate that the sources are exempt from additional RACT III requirements based on the exemption provisions provided 25 PA Code §129.111.

2.3.2 Presumptive VOC Sources

Table 7 summarizes the presumptive VOC RACT III sources. As required by 25 PA Code §129.115(d)(1), sources matching specifications outlined in 25 PA Code §129.111(a) must demonstrate compliance with the applicable RACT emission limit by January 1, 2023. As detailed below, Transco is requesting a waiver of the initial compliance demonstration to use prior Department-approved stack test results. Prior test dates are summarized in **Table 7**. For these sources, Transco will conduct stack testing to demonstrate ongoing compliance with presumptive RACT requirements every five years

2.3.2.1 Waiver Request

Station 520 conducted reference method NOx and VOC stack testing on the five engines (P101 thru P105) and 2 compressor turbines (P106 and P107) in 2016 to satisfy RACT II requirements and in March 2021 as part of the five-year compliance demonstration cycle. These same sources undergo periodic NOx testing using CTM-034 semi-annually. All results indicate compliance with the RACT III NOx and VOC standards, of which only the engine VOC standard has changed. Transco considers the 2021 RACT II test results to be representative of current operation and requests a waiver from the initial compliance demonstration provisions set forth at 25 PA Code §129.115(d)(1).

Given the delays the Department encountered in finalizing the RACT III rule, PADEP attempted to provide flexibility to sources by accepting previous stack tests to comply with RACT III. However, the window of time identified (November 12, 2021 – November 12, 2022) is misaligned with the majority of the five-year compliance demonstration RACT II stack tests performed in 2021. RACT III provided sources less than 50 days to demonstrate initial compliance, a timeline that includes a testing protocol review by the Department and testing notification window. Performing the compliance stack tests on units that operate a natural gas transmission pipeline system require sufficient lead time to plan and timing of the testing is dependent on pipeline conditions. Station 520's RACT II five-year compliance tests demonstrate compliance with the requirements for RACT III. For these reasons, Transco seeks flexibility from the Department to accept its 2021 RACT II compliance demonstration for its Station 520 sources as the initial compliance demonstration for RACT III or use enforcement discretion in the form of an alternative compliance schedule that provides additional time to schedule and complete testing as needed.

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2.3.3 Case-by-case VOC Sources

A case-by-case RACT analysis must be performed for VOC sources that are not classified as exempt or presumptive VOC RACT sources. There are no VOC sources at Station 520 that are subject to case-by-case since all sources are classified as exempt or presumptive VOC RACT III sources.

Table 7: VOC RACT III Update Summary

Source ID	Source	VOC RACT Category	VOC RACT Proposed Requirements	Compliance Demonstration	Compliance Test Date
P101	Ingersoll-Rand 412-KVS	Presumptive	Limit VOC <= 0.5 gram VOC/bhp-hr excluding formaldehyde. §129.112(g)(2)(i)(B)	Conduct stack testing and maintain record of compliance with emission rate limitation.	03/22/2021
P102	Ingersoll-Rand 412-KVS				03/23/2021
P103	Ingersoll-Rand 412-KVS				03/22/2021
P104	Ingersoll-Rand 412-KVS				03/22/2021
P105	Ingersoll-Rand 412-KVS				03/22/2021
P106	Solar Mars 90	Presumptive	Limit VOC <= 9 ppmvd VOC (as propane) @ 15% oxygen. §129.112(g)(2)(V)(B)	Conduct stack testing and maintain record of compliance with emission rate limitation.	03/23/21
P107	Solar Mars 90				03/23/21
P116	Solar Titan 130S w/ Oxidation Catalyst				10/5/2022

Source ID	Source	VOC RACT Category	VOC RACT Proposed Requirements	Compliance Demonstration	Compliance Test Date
P110	Waukesha 2895 GL Emergency Generator	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
P117	GE Waukesha P48GL Emergency Generator	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
036	Cyclotherm Boiler 2800-L-N	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
037	Space Heaters (15)	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
P109	Fugitive Piping and Venting	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
BLO	Blowdown/Venting	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
P112	Parts Washer	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable
P114	Storage Tanks (5) > 2,000 gal	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable

3. NOX RACT III ANALYSIS

This section provides an estimate of potential and baseline NOx emissions, a listing of each of the NOx sources applicable to presumptive or case-by-case RACT III requirements, and proposed compliance demonstrations.

3.1 Estimate of Potential and Actual NOx Emissions

As required by 25 PA Code §129.92(a)(4), **Table 8** provides the estimated potential and actual NOx emissions at Station 520.

As established in the current TVOP 41-00001, the potential NOx emissions are based on permitted operating data, unit capacities, throughputs, and emission factors.

The baseline emissions for the purposes of this submittal are defined as the actual emissions for 2021 required to be reported under 25 PA Code §129.92(a)(4). Baseline actual emissions are calculated based on historical operating data and the applicable emission factor.

The baseline actual NOx emissions from the engines (Source IDs P101 thru P105) and the turbines (Source IDs P106, P107, and P116) are based on 2021 operating hours and stack test results.

The baseline actual NOx emissions from the boiler (Source ID 036) and the emergency generators (Source IDs P110 and P117) are based on historical operating data and UP EPA AP-42 emission factors.

Table 8: Baseline, Actual, and Potential NOx Emissions

Source ID	Source Name	NOx Emission Factor	Reference	Baseline Year	Capacity	Baseline Actual NOx Emissions (TPY)	Potential Capacity	Potential NOx Emissions (TPY)
P101	Ingersoll-Rand 412-KVS	13.56 lb/hr	Stack Test	2021	Hours of Operation	7.98	2,050 BHP	59.39
P102	Ingersoll-Rand 412-KVS	13.56 lb/hr	Stack Test	2021	Hours of Operation	3.80	2,050 BHP	59.39
P103	Ingersoll-Rand 412-KVS	13.56 lb/hr	Stack Test	2021	Hours of Operation	2.16	2,050 BHP	59.39
P104	Ingersoll-Rand 412-KVS	13.20 lb/hr	Stack Test	2021	Hours of Operation	4.65	2,050 BHP	57.82
P105	Ingersoll-Rand 412-KVS	13.20 lb/hr	Stack Test	2021	Hours of Operation	3.53	2,050 BHP	57.82
P106	Solar Mars 90	79.30 lb/hr	Stack Test	2021	Hours of Operation	0.79	12,600 BHP	95.16
P107	Solar Mars 90	79.30 lb/hr	AP-42	2021	Hours of Operation	0.46	12,600 BHP	133.22
P116	Solar Titan 130S w/ Oxidation Catalyst	8.70 lb/hr	AP-42	2021	Hours of Operation	3.29	20,545 BHP	37.71
P110	Waukesha 2895 GL Emergency Generator	4.08 lb/MMBtu	AP-42	2021	Hours of Operation	0.25	607 BHP	4.90
P117	GE Waukesha P48GL Emergency Generator	2.00 g/bhp-hr	AP-42	2021	Hours of Operation	0.36	1,065 BHP	1.17
036	Cyclotherm Boiler 2800-L-N	100.00 lb/MMscf	AP-42	2021	Hours of Operation	0.76	3.8 MCF/hr	1.64
037	Space Heaters (15)	100.00 lb/MMscf	N/A	2021	Hours of Operation	< 1	1.9 MCF/hr	0.42

3.2 NOx RACT III Source Applicability

This section provides the detailed RACT analysis for affected NOx sources. The sources are identified as exempt, presumptive, or case-by-case.

3.2.1 Exempt NOx RACT III Sources

25 PA Code §129.111 states that sources that commenced operation after August 3, 2018, or NOx sources with PTE less than 1 tpy are exempt from RACT requirements.

The space heaters (Source ID 037) have a potential to emit of less than 1 ton per year of NOx emissions, combined. Therefore, these sources are exempt from the RACT III requirements.

Table 9: Exempt NOx RACT Sources

Source ID	Source	Permitted Capacity	Potential NOx Emissions (TPY)	Exempt RACT Category	RACT Citation
037	Space Heaters (15)	1.9 MCF/hr	0.42	PTE < 1 TPY	§129.111(c)

3.2.2 Presumptive NOx RACT III Sources

Presumptive RACT III sources include sources which have a NOx PTE greater than or equal to 1 TPY, but less than 5 TPY. Additionally, 25 PA Code §129.112 sets presumptive requirements for various types and sizes of sources.

- Lean burn stationary internal combustion engines with a rating equal to or greater than 500 bhp and less than 3.500 bhp fired by natural gas can comply with the presumptive NOx RACT III emission limit of 3 gram NOx/bhp-hr (129.112(g)(3)(i)(A)).
- Simple Cycle combustion turbines with a rated output equal to or greater than 4,100 BHP, and less than 60,000 BHP, fired by natural gas can comply with the presumptive NOx RACT III emission limit of 42 ppmvd NOx at 15% oxygen (§129.112(g)(2)(V)(A)).
    - Sources P106 and P106, two (2) Solar Mars 90 combustion turbines, are subject to presumptive requirements under RACT III and operate under an alternative RACT emission limit under the RACT II rule. Transco has not modified or changed these sources that commenced operation on or before October 24, 2016, and has not installed and commenced operation of a new source after October 24, 2016. Therefore, Transco is electing to submit an analysis, under the provisions of §129.114(i), that demonstrates that compliance with the existing alternative RACT emission limitation approved by the department under §129.99(e) assures compliance with the provisions in §129.114(a) through (c) and (e) through (h). These sources are addressed in Section 3.3 as case-by-case RACT III sources.
- Emergency standby engines that operate less than 500 hours in a 12-month rolling period can comply with the presumptive RACT III requirements by operating and maintaining the source in accordance to manufacturer specifications and good operating practices (§129.112(c)(10)).
- Operators of boilers or combustion sources less than 20 MMBtu/hr can comply with presumptive NOx RACT III requirements by operating and maintaining the source in accordance to manufacturer specifications and good operating practices (§129.112(c)(4)).

Table 10: Presumptive NOx RACT Sources

Source ID	Source	Permitted Capacity	Presumptive RACT Category	RACT Citation
P101	Ingersoll-Rand 412-KVS	2,050 BHP	Lean Burn RICE (>= 500 bhp & < 3,500 bhp)	§129.112(g)(3)
P102	Ingersoll-Rand 412-KVS	2,050 BHP		
P103	Ingersoll-Rand 412-KVS	2,050 BHP		
P104	Ingersoll-Rand 412-KVS	2,050 BHP		
P105	Ingersoll-Rand 412-KVS	2,050 BHP		
P116	Solar Titan 130S w/ Oxidation Catalyst	20,545 BHP	Simple Cycle Combustion Turbine (> 4,100 bhp & < 60,000 bhp)	§129.112(g)(2)
P110	Waukesha 2895 GL Emergency Generator	607 BHP	Emergency engine operating < 500 hrs/yr	§129.112(c)(10)
P117	GE Waukesha P48GL Emergency Generator	1,065 BHP	Emergency engine operating < 500 hrs/yr	§129.112(c)(10)
036	Cyclotherm Boiler 2800-L-N	3.5 MMBtu/hr	Boiler (< 20 MMBtu/hr)	§129.112(c)(1)

3.2.3 Case-by-case NOx RACT Sources

A case-by-case RACT analysis must be performed for NOx sources that are not classified as exempt or presumptive NOx RACT sources. There are no NOx sources at Station 520 that are case-by-case since all equipment are classified as exempt or presumptive NOx RACT III sources. However, if a source cannot meet the applicable presumptive requirements listed in 25 PA Code §129.112, a case-by-case analysis, or alternative RACT proposal, must be conducted.

If an owner or operator has not modified or changed any sources at Station 520 that commenced operation on or before October 24, 2016, and has not installed and commenced operation of a new source after October 24, 2016, they may, in place of the alternative RACT requirement or RACT emission limitation required under §129.114(d), submit an analysis, certified by the responsible official under the provisions of §129.114(i), that demonstrates that compliance with the alternative RACT requirement or RACT emission limitation approved by the department under §129.99(e) assures compliance with the provisions in §129.114(a) through (c) and (e) through (h). **Table 11** below presents a list of the case-by-case NOx sources at Station 520.

Table 11: Case-by-case NOx RACT Sources

Source ID	Source	Permitted Capacity	Presumptive RACT Category	RACT Citation
P106	Solar Mars 90: 520-6	12,600 BHP	§129.99(e) Compliance Demonstration Analysis	§129.114(i)
P107	Solar Mars 90: 520-7	12,600 BHP		

As noted above, Transco is electing to submit an analysis, certified by the responsible official under the provisions of §129.114(i), that demonstrates that compliance with the alternative RACT requirement or

RACT emission limitation approved by the department under §129.99(e) assures compliance with the provisions in §129.114(a) through (c) and (e) through (h). The case-by-case analysis is discussed in the next section.

3.3 NOx RACT III Analysis – Mars 90 Turbines

The two (2) Solar Mars 90 turbines, Units 6 and 7, at Station 520 are simple cycle combustion turbines, also referred to as "gas turbines." In this context, "gas" does not refer to natural gas, but to the gaseous nature of the working fluid (air and combustion products) that imparts the force to the turbine blades that cause the shaft to spin. The gas turbine relies primarily on air to provide the force to many rows of axial turbine blades to provide the rotational output of the engine shaft, which in turn drives the connected mechanical compressor.

Each natural gas fired turbine is rated at 12,600 hp and the heat input for each turbine is permitted at 105.1 MMBtu/hr. Both units function as "peaking units" at the station, meaning they are operated during periods of peak natural gas demand only. As such, their operation is limited in nature and the current operating permit limit operation to 2,400 hours per year for Unit 6 and 3,360 hours per year for Unit 7.

Due to the stress, temperature, and corrosion conditions to which the Mars 90 units are subjected, components will undergo deterioration over time. As such, the turbine, including potentially upgraded components, will be regularly inspected and evaluated for repairs and/or replacement. The interval within which this must happen is 30,000 to 35,000 hours of cumulative runtime. In most cases, after 35,000 hours of cumulative run time, the units require a complete overhaul which includes replacement of all major components in order to ensure safe and reliable gas compression service. Based on operational knowledge, the routine inspection and evaluation of the units will trigger repairs and replacement of the major components such as the power turbine and gas generator sooner than 35,000 hours.

Unit #6 (Source ID P106) was installed in 1990, and due to the unit's age, the remaining useful life of the unit is limited to the time interval between occurrences of overhauls, which is 35,000 hours of cumulative run time. Factoring in the permit allowable run time of 2,400 hours, Source ID P106 will have a remaining useful life of approximately 15 years.

Unit #7 (Source ID P107) was installed in 1993. Considering the same maintenance requirements and the permit allowable run time of 3,360 hours, Source ID P107 will have a remaining useful life of approximately 10 years.

See **Table 12** for additional air permit information for the turbines.

Table 12: Identifying Permit Information

Parameter	Permit Information
Permit Activity No.	41-00001
Source ID	P106, P107
Permitted Annual NOx Emission Rate	95.2 tons/yr per turbine based on 2,400 hrs/yr per turbine (P106) 133.2 tons/yr per turbine based on 3,360 hrs/yr per turbine (P107)
Permitted Hourly NOx Emission Rate	79.3 lb/hr per turbine (P106) 79.3 lb/hr per turbine (P107)

The turbines have a NOx emission limit that exceeds the presumptive limit of 42 ppmvd as identified in 25 Pa. Code §129.112. Transco has evaluated and determined that there is no new NOx air cleaning device, air pollution control technology, or technique available at the time of submittal of this analysis with which to equip both combustion turbines P106 and P107 to satisfy the updated RACT III presumptive NOx emission limit. Additionally, each technically feasible air cleaning device, air pollution control technology, or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the department under §129.99(e) had a cost effectiveness greater than $7,500 per ton of NOx emissions reduced. Therefore, this Compliance Demonstration Analysis has been prepared in accordance with 25 Pa. Code §129.114(i) for the two (2) turbines to assure compliance with the provisions of §129.114 subsections (a) through (c), and (e) through (h).

3.3.1 Evaluation of New Control Technology

Transco is required, under §129.114(i)(1)(i)(A), to submit a statement that explains how it has determined that there are no new pollutant specific air cleaning devices, air pollution control technologies, or techniques available to equip both combustion turbines P106 and P107 with to satisfy the updated RACT III presumptive NOx emission limit.

Previously, under the RACT submittal for §129.99(d), an alternative RACT proposal prepared in accordance with 25 Pa. Code §129.92 was provided. The analysis for the alternative RACT proposal utilized a “top-down” evaluation of the most stringent levels of NOx emission control to determine the technical and economic feasibility of relevant NOx reduction technologies. The analysis included four basic steps:

Transco reviewed publicly available databases to identify potential control systems which had been installed, as well as emissions limits achieved on sources similar to the proposed turbine, including:

- EPA’s New Source Review website;
- EPA’s RACT/BACT/LAER Clearinghouse (RBLC) Database;
- Various state air quality regulations and websites;
- Control technology vendors’ information;
- Technical books and articles; and
- State and federal guidance documents

Utilizing this same “top-down” evaluation for the alternative RACT requirement submittal under 129.114(a), Transco has evaluated and determined that there is no new NOx air cleaning device, air pollution control technology, or technique available at this time that enables combustion turbines P106 and P107 to satisfy the updated RACT III presumptive NOx emission limit.

Control systems previously located under the “top-down” evaluation for the RACT proposal submitted under §129.99(d) to reduce NOx emissions from the turbines included:

- Dry Low NOx (DLN) Combustor Technology;
- Wet Controls – Water and Steam Injection;
- Selective Catalytic Reduction (SCR); and
- Selective Non-Catalytic Reduction (SNCR).

Additional control options previously located under the “top-down” evaluation for the RACT proposal submitted under §129.99(d) to reduce NOx emissions from simple-cycle turbines, not listed in the EPA’s Technology Transfer Network, included the following:

- Rich/Quench/Lean (RQL) Combustion;
- Catalytic Combustion – Xonon™
- Catalytic Absorption (formally SCONOx™); and
- Alternate Lower FBN (fuel-bound nitrogen) Fuels.

The descriptions of each technology previously included in the written RACT proposal submitted under §129.99(d) is provided below.

3.3.1.1 Dry Low NOx (DLN) Combustors

DLN combustion control techniques reduce NOx emissions without the use of water or steam injection. Two DLN combustion designs are available: lean pre-mixed combustion and rich/quench/lean staged combustion. Historically, gas turbine combustors were designed for operation with a 1:1 stoichiometric ratio (equal ratio of fuel and air). However, with fuel lean combustion (sub-stoichiometric conditions), the additional excess air cools the flame and reduces the rate of thermal NOx formation. With reduced residence time combustors, dilution air is added sooner than with standard combustors resulting in the combustion gases attaining a high temperature for a shorter time, thus reducing the rate of thermal NOx formation. Pilot flames are used to maintain combustion stability to maintain the fuel-lean conditions.

SoLoNOx DLN combustors are available for the Solar Mars 90 turbines. The technology uses lean combustion control technology to ensure uniform air/fuel mixture and to minimize formation of regulated pollutants while maintaining the same power and heat rate as equivalent models with conventional combustion technology.

Based on information provided by Solar, Transco reviewed costs to retrofit Units 6 and 7 to achieve a NOx emission rate of 25 ppm. This option was preferred to lower emitting SoLoNOx options because these retrofit options would result in a turbine with a higher horsepower.

3.3.1.2 Wet Controls – Water and Steam Injection

Water and steam injection directly into the flame area of the turbine combustor results in a lower flame temperature and reduces thermal NOx formation; however, fuel NOx formation is not reduced with this technique. The water or steam injection rate is typically described on a mass basis by a water-to-fuel ratio (WFR) or steam-to-fuel ratio (SFR). Higher WFRs and SFRs translate to greater NOx reductions, but may also cause potential flameouts, increasing maintenance requirements and reducing turbine efficiency. In addition, this control technique requires the steady availability of large amounts of high-quality water, which would necessitate the installation of a water purification system, and its associated waste disposal (steam injection is typically practicable only for facilities that produce steam for other uses on site). Water injection has rarely been used on simple cycle turbines in gas transmission service. Therefore, the use of water or steam injection will not be considered further in this RACT analysis for the turbine.

3.3.1.3 Selective Catalytic Reduction (SCR)

In the SCR process, ammonia (NH_3), usually diluted with air or steam, is injected through a grid system into the flue/exhaust gas stream upstream of a catalyst bed. The catalyst could be titanium dioxide, vanadium pentoxide or zeolite-based catalysts. On the catalyst surface, the NH_3 reacts with NOx to form molecular nitrogen and water. The basic reactions are as follows:

$$4NH_3 + 4NO + O_2 = 4N_2 + 6H_2O$$

$$8NH_3 + 6NO_2 = 7N_2 + 12H_2O$$

The reaction of NH_3 and NOx is favored by the presence of excess oxygen. Another variable affecting NOx reduction is exhaust gas temperature. The greatest NOx reduction occurs within a reaction window at catalyst bed temperatures between 400°F and 800°F for base metal catalyst types (i.e., conventional SCR applications with lower temperature range platinum catalysts and with higher temperature range 550°F-800°F vanadium-titanium catalysts).

However, base metal catalysts deteriorate quickly when continuously subjected to temperatures above this range or under thermal cycling, which commonly occurs in turbines in gas compression service. In effect, if these catalyst systems are operated beyond their specified temperature ranges, oxidation of the ammonia to either additional nitrogen oxides or ammonium nitrate may result. Moreover, the variable load demands on turbines in gas compression services create significant operational complexities for use of SCRs.

Based on a review of EPA's RBLC database, SCR systems have been installed on some simple cycle combustion turbines and are therefore considered technically feasible, and SCR is considered further in this RACT analysis.

3.3.1.4 Selective Non-Catalytic Reduction (SNCR)

SNCR technology involves using ammonia or urea injection similar to SCR technology but at a much higher temperature window of 1,600°- 2,200°F. The following chemical reaction occurs without the presence of a catalyst:

$$NOx + NH_3 + O_2 + H_2O + (H_2) = N_2 + H_2O$$

The operating temperature can be lowered from 1,600°F to 1,300°F by injecting readily oxidizable hydrogen with the ammonia. However, beyond the upper temperature limit, the ammonia is converted to NOx, resulting in increased NOx emissions.

Because the exhaust temperatures in gas turbines typically do not exceed 1,250°F, the operative temperature window of this control alternative is not technically feasible for this application. The exhaust temperature for Unit 6 and Unit 7 gas turbines is less than 900 °F, which is well below the range for SNCR applications. In addition, this technology has a residence time requirement of 100 milliseconds, which is relatively slow for gas turbine operating flow velocities. Thus, adequate residence time for the NOx destruction chemical reaction will not be available.

Further, a review of the RBLC database for recent BAT/LAER determinations for this particular source category and discussions with control system vendors did not indicate that SNCR systems have been successfully installed for NOx control for similar simple cycle turbines. In view of the above limitations in utilizing SNCR control, this control alternative is not considered technically feasible and will be precluded from further consideration in this RACT analysis.

3.3.1.5 Rich/Quench/Lean (RQL) Combustion

RQL combustors burn fuel-rich in the primary zone and fuel-lean in the secondary zone, reducing both thermal and fuel NOx. Incomplete combustion under fuel-rich conditions in the primary zone produces an atmosphere with a high concentration of CO and H2, which replace some of the oxygen for NOx formation and act as reducing agents for any NOx formed in the primary zone. Based on available test results, this control alternative is more effective for higher fuel-bound nitrogen fuels in retarding the rate of fuel NOx formation.

Theoretically, this control alternative is applicable to natural gas-fired turbines; however, based on information presented in the EPA ACT (Alternative Control Techniques) document, RQL combustors are

not commercially available for most turbine designs and there is no known application for only natural gas-fired simple cycle combustion turbines. Because it is not commercially demonstrated on combustion turbines, RQL combustion will be removed from further consideration in this RACT analysis.

3.3.1.6 Catalytic Combustion – Xonon™

Xonon™ is a catalytic combustion technology in development that reduces the production of NOx. The technology has only been tested on small turbines (less than 10 MW) and it is still not commercially available for the simple cycle turbines at Station 520. In a catalytic combustor, the fuel and air are premixed into a fuel-lean mixture and then passed into a catalyst bed. In the bed, the mixture oxidizes without forming a high-temperature flame front, thereby reducing peak combustion temperatures below 2,000ºF, which is the temperature at which significant amounts of thermal NOx begin to form. However, until such time that the technology is commercially available, catalytic combustors are not considered technically feasible. In addition, discussions with Solar indicated that this technology is not commercially available for any Solar product. In view of the above limitations in utilizing catalytic combustor control, this control alternative is precluded from further consideration.

3.3.1.7 Catalytic Absorption (formally SCONOx™)

SCONOx™, a post-combustion technology, proposes to remove NOx from the exhaust gas stream following NOx formation in combined cycle combustion turbine applications. While SCONOxTM has been marketed for more than ten years in the US, it has been installed and tested on only a handful of installations. SCONOx™ employs an oxidation catalyst followed by a potassium carbonate bed located within a heat recovery steam generator (to obtain the proper temperature window). The bed adsorbs NOx where it reacts to form potassium nitrates. Periodically, a hydrogen gas stream is passed through individual sections of the catalyst, reacting with the potassium nitrates to reform potassium carbonate and the ejection of nitrogen gas and water.

The advantage of SCONOx™ relative to SCR is that SCONOx™ does not require ammonia injection to achieve NOx emissions control. However, the benefit of not using ammonia has been replaced by other potential operational problems that impair the effectiveness of the technology. First, the technology has not been demonstrated for larger turbines and the vendor's contention is still being debated; second, the technology is not readily adaptable to high-temperature applications outside the 300°-700°F range and is susceptible to potential thermal cycling; last, the potassium carbonate coating on the catalyst surface is an active chemical reaction and reformulation site, which makes it particularly vulnerable to fouling. In addition, based on review of EPA's RBLC database and other permits issued in different states, this technology has not been applied on simple cycle combustion turbines used for natural gas compression. Therefore, this technology is not considered further in this RACT analysis.

3.3.1.8 Alternative Lower FBN (Fuel-Bound Nitrogen) Fuels

The utilization of a lower FBN fuel such as coal-derived gas or methanol is not deemed practical based on the nature of the operations at Station 520. Thus, this control alternative is not addressed

3.3.2 Summary of NOx Controls from §129.99(d) Submittal

Transco is required, under §129.114(i)(1)(i)(B), to provide a list of the technically feasible air cleaning devices, air pollution controls technologies, or techniques previously identified and evaluated under §129.92(b)(1) through (3) that were included in the written RACT proposal submitted under §129.99(d) and approved by the department under §129.99(e).

Each of the technologies discussed above was potentially applicable for installation on turbines. However, as discussed above, not all of the technologies had been demonstrated in practice for use with simple

cycle combustion turbines. The control technologies, which were demonstrated in commercial practice on turbines and their associated control efficiencies, and were included in the written RACT proposal submitted under §129.99(d), are summarized in **Table 13** below.

Table 13: Technically Feasible NOx Controls Submitted Under §129.99(d)

Rank	Control Technology	Estimated Control Efficiency (%)
1	DLN, 25 ppm SoLoNOx Technology	83.46
2	SCR	80.00

The only control options evaluated that were identified as “technically feasible” were Dry Low NOx Combustors and Selective Catalytic Reduction.

Transco is also required to provide the summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology, or technique, and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology, or technique as submitted previously under §129.99(d).

This section includes the cost analysis for these technologies as submitted previously under §129.99(d). A summary of the cost effectiveness calculation for installation of DLN and SCR on the turbine is shown in **Table 14**.

Table 14: Summary of NOx Emission Reductions and Cost Effectiveness Submitted Under §129.99(d)

Source	Control Technology	Baseline NOx Emission (TPY)	Controlled NOx Emission (TPY)	NOx Emission Reduction (TPY)	Cost Effectiveness ($/ton)
Unit 6	DLN	95.20	15.74	79.46	$12,545
	SCR	95.20	19.51	75.69	$17,234
Unit 7	DLN	133.20	22.04	111.16	$11,100
	SCR	133.20	27.30	105.90	$14,959

The cost information was based on vendor estimates, USEPA’s Air Pollution Control Technology Fact Sheets, and USEPA’s OAQPS cost manual. The baseline emissions used to develop this cost analysis were 95.2 tons/yr of NOx, based on 2,400 hours per year of operation for Unit 6 and 133.2 tons/yr of NOx emissions based on 3,360 hours of operation for Unit 7.

This federally enforceable operating restriction is based on the permitted hours of operation for the turbines.

Evaluation of the economic feasibility analysis as submitted previously under §129.99(d) demonstrates that the cost effectiveness remains greater than $7,500 per ton of NOx emissions reduced

Detailed cost effectiveness calculations as submitted previously under §129.99(d) for installation of DLN and SCR on the turbines can be found in **Appendix A** of this document.

3.3.3 Recertification of NOx RACT Controls for Combustion Turbine

The two (2) Solar Mars 90 simple cycle combustion turbines (Units 6 and 7) operated at Transco Station 520 cannot achieve the 25 Pa. Code §129.112 NOx standard. Therefore, Transco is pursuing to recertify

the Alternative RACT Proposal previously submitted under §129.99(d) for each turbine under the provisions of 25 Pa. Code §129114(i).

There are no new technically and economically feasible control options for NOx from the turbines, other than what was previously located, and is currently in place. The technically feasible control options located in the previous RACT submittal remain economically infeasible with cost effectiveness amounts greater than $7,500 per ton of NOx emissions reduced. Current operations include proper operation of the turbines and following good operating practices and annual operating restrictions. Therefore, Transco proposes to recertify the following emission/operational limits as RACT for each turbine:

- NOx ≤ 79.3 lb/hr
- NOX ≤ 205 ppmvd @ 15% O_2
- Annual Hours of Operation
  - Unit #6 ≤ 2,400 hrs/yr
  - Unit #7 ≤ 3,360 hrs/yr

In accordance with 129.92(a), an application to incorporate the provisions of this Alternative RACT proposal is provided in **Appendix B.**

3.4 NOx RACT III Compliance Demonstration

The following sections detail the various NOx RACT III sources (exempt, presumptive, or case-by-case) and the requirements for Station 520 to demonstrate compliance with RACT. **Table 15** outlines the NOx RACT sources, NOx RACT category, RACT requirement, and RACT compliance demonstration.

3.4.1 Exempt NOx Sources

Table 15 summarizes the exempt NOx RACT III sources at the site. As required by 25 PA Code §129.115(f), Transco will maintain records at the facility to demonstrate that the sources are exempt from additional RACT III requirements based on the exemption provisions provided 25 PA Code §129.111.

3.4.2 Presumptive NOx Sources

Table 15 summarizes the presumptive NOx RACT III sources. As required by 25 PA Code §129.115(d)(1), sources matching specifications outlined in 25 PA Code §129.111(a) must demonstrate compliance with the applicable RACT emission limit by January 1, 2023, with subsequent testing required every 5 years. As justified in Section 2.3.2 discussing “Presumptive VOC Sources”, Transco is requesting a waiver of the initial compliance demonstration in order to use prior Department-approved stack test results which demonstrate that the sources meet the applicable RACT standard. In addition, Transco will operate applicable sources according to manufacturer specifications and with good operating practices.

3.4.3 Case-by-case NOx Sources

Transco conducted a NOx RACT case-by-case analysis for the two (2) Mars 90 simple cycle combustion turbines listed in **Table 11**.

Transco proposes the recertification of the following emission/operational limits as RACT for each turbine:

- NOx ≤ 79.3 lb/hr
- NOX ≤ 205 ppmvd @ 15% O_2
- Annual Hours of Operation

- Unit #6 ≤ 2,400 hrs/yr
- Unit #7 ≤ 3,360 hrs/yr

Transco will conduct initial stack testing to demonstrate compliance with this case-by-case RACT limit and every five years, thereafter, as currently required by the Title V permit. In addition, Transco will continue to conduct semi-annual emission monitoring using a Department approved portable exhaust gas analyzer. Transco proposes that these measures satisfy RACT for the turbines.

3.4.4 NOx RACT Compliance Summary

Table 15 outlines the NOx RACT sources, NOx RACT category, RACT requirement, and RACT compliance demonstration.

Table 15: NOx RACT III Update Summary

Source ID	Source	NOx RACT Category	NOx RACT Proposed Requirements	Compliance Demonstration	Compliance Test Date
P101	Ingersoll-Rand 412-KVS	Presumptive	Limit VOC <= 0.5 gram VOC/bhp-hr excluding formaldehyde. §129.112(g)(2)(i)(B)	Conduct stack testing and maintain record of compliance with emission rate limitation	03/22/2021
P102	Ingersoll-Rand 412-KVS				03/22/2021
P103	Ingersoll-Rand 412-KVS				03/22/2021
P104	Ingersoll-Rand 412-KVS				03/22/2021
P105	Ingersoll-Rand 412-KVS				03/22/2021
P106	Solar Mars 90	Case-by-case	§129.99(e) Compliance Demonstration Analysis §129.114(i)	Conduct stack testing and maintain record of compliance with emission rate limitation	03/23/2021
P107	Solar Mars 90				03/23/2021
P116	Solar Titan 130S w/ Oxidation Catalyst	Presumptive	Limit VOC <= 42 ppmvd VOC (as propane) @ 15% oxygen. §129.112(g)(2)(V)(B)	Conduct stack testing and maintain record of compliance with emission rate limitation.	10/5/2022
P110	Waukesha 2895 GL Emergency Generator	Presumptive	Operate according to manufacturer specifications and good operating practices (§129.112(c)(10))	Maintain records according to §129.115(f).	Not Applicable
P117	GE Waukesha P48GL Emergency Generator	Presumptive	Operate according to manufacturer specifications and good operating practices (§129.112(c)(10))	Maintain records according to §129.115(f).	Not Applicable
036	Cyclotherm Boiler 2800-L-N	Presumptive	Operate according to manufacturer specifications and good operating practices (§129.112(c)(4))	Maintain records according to §129.115(f).	Not Applicable

Source ID	Source	NOx RACT Category	NOx RACT Proposed Requirements	Compliance Demonstration	Compliance Test Date
037	Space Heaters (15)	Exempt	PTE VOC less than 1 TPY (129.111(c))	Maintain records in accordance with 129.115(h).	Not Applicable

APPENDIX A TVOP MODIFICATION FORMS

December 2022

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

FOR OFFICIAL USE ONLY

OP #: _____

Date: _____

OPERATING PERMIT MODIFICATION APPLICATION

Section 1 – General Information

1.1 Application Type

Type of permit for which application is made:

☐ Minor Modification ☐ State-Only Operating Permit

☒ Significant Modification ☐ Title V Operating Permit

Existing Operating Permit No: 41-00001

1.2 Facility Information

Firm Name: TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC

Federal Tax ID: 74-1079400

Facility Name: TRANSCONTINENTAL GAS/SALLADASBURG STATION 520

Plant Code:

NAICS Code: 486210

SIC Code: 4922

Description of NAICS Code: Pipeline Transportation of Natural Gas

Description of SIC Code: Trans. & Utilities - Natural Gas Transmission

County:

Municipality:

Latitude:

Longitude:

Horizontal Reference Datum:

Horizontal Collection Method:

Reference Point:

1.3 Permit Contact Information

Name: Michael Hahn

Title: Environmental Specialist V

Address: 99 Farber Rd

City: Princeton

State: NJ

ZIP: 08540-5917

Telephone: 609) 285-2407

Email: Michael.Hahn@williams.com

1.4 Small Business Question

Are you a small business as defined by the Pennsylvania Air Pollution Control Act? ☐ Yes ☒ No

Are you a small business as defined by the U.S. Small Business Administration? ☐ Yes ☒ No

1.5 Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No

Place confidential information on separate page(s) marked "Confidential".

In order to request confidential treatment for information in any document, you must submit a redacted version of the relevant document with the confidential information blacked out (and thus suitable for public disclosure), along with a letter of request containing a table identifying the page and line number of each redaction, along with a justification for each redacted item as to why it should be deemed confidential under the specific criteria allowed under 25 Pa. Code §127.12(d) and Section 13.2 of the APCA.

1.6 Certification of Truth, Accuracy and Completeness by a Responsible Official

I certify that, subject to the penalties of Title 18 Pa. C.S.A. Section 4904 and 35 P.S. Section 4009(b)(2), I am the responsible official having primary responsibility for the design and operation of the facilities to which this application applies and that the information provided in this application is true, accurate, and complete to the best of my knowledge, information, and belief formed after reasonable inquiry.

(Signed) _____ Date: _____

Name (Typed): Glen Jasek Title: VP GM Eastern Interstate

Telephone: (713) 215-2134

Email: Glen.Jasek@Williams.com

Section 2 – Inventory of Units Being Modified		
Unit ID No.	Unit Name	Unit Type
P101	Ingersoll-Rand 412-KVS	Combustion
P102	Ingersoll-Rand 412-KVS	Combustion
P103	Ingersoll-Rand 412-KVS	Combustion
P104	Ingersoll-Rand 412-KVS	Combustion
P105	Ingersoll-Rand 412-KVS	Combustion
P106	SOLAR MARS TURBINE 2 (12,600 HP)	Combustion
P107	SOLAR MARS TURBINE 2 (12,600 HP)	Combustion
P116	Solar Titan 130S w/ Oxidation Catalyst	Combustion
P110	Waukesha 2895 GL Emergency Generator	Combustion
P117	GE Waukesha P48GL Emergenvy Generator	Combustoin
036	Cyclotherm Boiler 2800-L-N	Combustion

Section 3 – Facility Changes

Complete this section ONLY if the changes are for the entire facility. If changes are for a source or sources, skip this Section and complete Section 4 for each Source in which a change is proposed.

3.1 Describe all proposed changes to this facility:

3.2 If the proposed facility changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

3.3 Anticipated date on which proposed change is scheduled to occur: _____

3.4 List the proposed revision language for the operating permit conditions. This includes all changes to the emissions, monitoring, testing, record-keeping, reporting requirements and work practice standard requirements. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

3.5 Provide a listing of all changes in chronological order (additions and subtractions) made at a facility since the last submittal and attach it to this application. For example:

- March 2016 - Added shot blast booth 5, exempted by the attached Request for Determination.
- Dec 2017 - Installed new paint line in accordance with Plan Approval XX-XXXXX

3.6 For renewals, please review the current operating permit. If you are proposing any changes to the conditions of the permit, please provide the condition number, the requested change, and justification for the requested change.

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P101 b. Source Name: Ingersoll-Rand 412-KVS

c. Manufacturer: Ingersoll-Rand d. Model No.: 412-KVS

e. Source Description: Ingersoll-Rand 412-KVS Reciprocating 2,050 HP

f. Rated Capacity (for engines use BHP): 2,050 g. Installation Date: 1961

h. Rated Power/Electric Output: 14.8 MMbtu/hr

i. Exhaust Temperature: 740 Units: F j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: 14,093 SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P102 b. Source Name: Ingersoll-Rand 412-KVS

c. Manufacturer: Ingersoll-Rand d. Model No.: 412-KVS

e. Source Description: Ingersoll-Rand 412-KVS Reciprocating 2,050 HP

f. Rated Capacity (for engines use BHP): 2,050 g. Installation Date: 1961

h. Rated Power/Electric Output: 14.8 MMbtu/hr

i. Exhaust Temperature: 740 Units: F j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: 14,093 SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P103 b. Source Name: Ingersoll-Rand 412-KVS

c. Manufacturer: Ingersoll-Rand d. Model No.: 412-KVS

e. Source Description: Ingersoll-Rand 412-KVS Reciprocating 2,050 HP

f. Rated Capacity (for engines use BHP): 2,050 g. Installation Date: 1961

h. Rated Power/Electric Output: 14.8 MMbtu/hr

i. Exhaust Temperature: 740 Units: F

j. Exhaust % Moisture:

k. Exhaust Flow Volume: 14,093 SCFM

4.3 General Control Device Information

a. Unit ID: b. Unit Name:

c Used by Sources:

d. Type:

e. Pressure Drop (in. H_2O): f. Capture Efficiency:

g. Flow Rate (specify unit):

h. Manufacturer: i. Model No.:

j. Installation Date:

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P104 b. Source Name: Ingersoll-Rand 412-KVS

c. Manufacturer: Ingersoll-Rand d. Model No.: 412-KVS

e. Source Description: Ingersoll-Rand 412-KVS Reciprocating 2,050 HP

f. Rated Capacity (for engines use BHP): 2,050 g. Installation Date: 1965

h. Rated Power/Electric Output: 14.8 MMbtu/hr

i. Exhaust Temperature: 740 Units: F

j. Exhaust % Moisture:

k. Exhaust Flow Volume: 14,093 SCFM

4.3 General Control Device Information

a. Unit ID: b. Unit Name:

c Used by Sources:

d. Type:

e. Pressure Drop (in. H_2O): f. Capture Efficiency:

g. Flow Rate (specify unit):

h. Manufacturer: i. Model No.:

j. Installation Date:

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P105 b. Source Name: Ingersoll-Rand 412-KVS

c. Manufacturer: Ingersoll-Rand d. Model No.: 412-KVS

e. Source Description: Ingersoll-Rand 412-KVS Reciprocating 2,050 HP

f. Rated Capacity (for engines use BHP): 2,050 g. Installation Date: 1970

h. Rated Power/Electric Output: 14.8 MMbtu/hr

i. Exhaust Temperature: 740 Units: F

j. Exhaust % Moisture:

k. Exhaust Flow Volume: 14,093 SCFM

4.3 General Control Device Information

a. Unit ID: b. Unit Name:

c Used by Sources:

d. Type:

e. Pressure Drop (in. H_2O): f. Capture Efficiency:

g. Flow Rate (specify unit):

h. Manufacturer: i. Model No.:

j. Installation Date:

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P106 b. Source Name: SOLAR MARS TURBINE 1 (12,600 HP)

c. Manufacturer: Solar Turbines d. Model No.: MARS 90

e. Source Description: Solar MARS 90 natural gas fired combustion turbine rated at 12,600 BHP

f. Rated Capacity (for engines use BHP): 12,600 g. Installation Date: 1990

h. Rated Power/Electric Output: 105.1 MMbtu/hr

i. Exhaust Temperature: 860 Units: F j. Exhaust % Moisture: k. Exhaust Flow Volume: 79,970 SCFM

4.3 General Control Device Information

a. Unit ID: b. Unit Name:

c Used by Sources:

d. Type:

e. Pressure Drop (in. H_2O): f. Capture Efficiency:

g. Flow Rate (specify unit):

h. Manufacturer: i. Model No.:

j. Installation Date:

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: Williams conducted a NOx RACT case-by-case analysis for the two (2) Mars 90 simple cycle combustion turbines. Williams will conduct initial stack testing to demonstrate compliance with this case-by-case RACT limit and every five years, thereafter as currently required by the Title V permit. In addition, Williams will continue to conduct semi-annual emission monitoring using a Department approved portable exhaust gas analyzer. Williams believes that these measures satisfy RACT for the engines

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P107 b. Source Name: SOLAR MARS TURBINE 1 (12,600 HP)

c. Manufacturer: Solar Turbines d. Model No.: MARS 90

e. Source Description: Solar MARS 90 natural gas fired combustion turbine rated at 12,600 BHP

f. Rated Capacity (for engines use BHP): 12,600 g. Installation Date: 1993

h. Rated Power/Electric Output: 105.1 MMbtu/hr

i. Exhaust Temperature: 860 Units: F j. Exhaust % Moisture: k. Exhaust Flow Volume: 79,970 SCFM

4.3 General Control Device Information

a. Unit ID: b. Unit Name:

c Used by Sources:

d. Type:

e. Pressure Drop (in. H_2O): f. Capture Efficiency:

g. Flow Rate (specify unit):

h. Manufacturer: i. Model No.:

j. Installation Date:

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: Williams conducted a NOx RACT case-by-case analysis for the two (2) Mars 90 simple cycle combustion turbines. Williams will conduct initial stack testing to demonstrate compliance with this case-by-case RACT limit and every five years, thereafter as currently required by the Title V permit. In addition, Williams will continue to conduct semi-annual emission monitoring using a Department approved portable exhaust gas analyzer. Williams believes that these measures satisfy RACT for the engines

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P116 b. Source Name: Solar Titan 130S w/ Oxidzation Catalyst

c. Manufacturer: Solar d. Model No.: Titan

e. Source Description: Solar Titan 130S combustion Turbine with Oxidation Catalsyt

f. Rated Capacity (for engines use BHP): 20,545 BHP g. Installation Date: _____

h. Rated Power/Electric Output: _____

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: NA

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P110 b. Source Name: Waukesha 2895 GL Emergency Generator

c. Manufacturer: Waukesha d. Model No.: 2895 GL

e. Source Description: Emergency Generator

f. Rated Capacity (for engines use BHP): 607 BHP g. Installation Date: _____

h. Rated Power/Electric Output: 5.20 MCF/HR

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: NA

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: P117 b. Source Name: GE Waukesha P48GL Emergency Generator

c. Manufacturer: Waukesha d. Model No.: P48GL

e. Source Description: Emergency Generator

f. Rated Capacity (for engines use BHP): 1,065 BHP g. Installation Date: _____

h. Rated Power/Electric Output: 8.10 MCF/HR

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: NA

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 4 – Unit Information (duplicate this section for each unit as needed)

4.1 Unit Type: ☒ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: 036 b. Source Name: Cyclotherm Boiler

c. Manufacturer: Cyclotherm d. Model No.: _____

e. Source Description: Boiler

f. Rated Capacity (for engines use BHP): _____ g. Installation Date: _____

h. Rated Power/Electric Output: 3.5 MMBtu/hr

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit: NA

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 5 – Compliance Plan for the Facility			
		Yes	No
5.1	Will your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements during the permit duration?	☒	☐
5.2	Will your facility be in compliance with all applicable requirements presently scheduled to take effect during the term of the permit?	☒	☐

APPENDIX B COMPLIANCE REVIEW

December 2022

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☐ Original Filing — Date of Last Compliance Review Form Filing:
☒ Amended Filing — 10/20/2021

Type of Submittal

☐ New Plan Approval ☐ New Operating Permit ☐ Renewal of Operating Permit
☒ Extension of Plan Approval ☐ Change of Ownership ☐ Periodic Submission (@ 6 mos)
☐ Other: _____

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
Transcontinental Gas Pipe Line Company, LLC

Address 99 Farber Road
Princeton, NJ 08540

Telephone (609) 285-2407 **Taxpayer ID#** 74-1079400

Permit, Plan Approval or Application ID# PA 19-00007B

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual ☐ Syndicate ☐ Government Agency
☐ Municipality ☐ Municipal Authority ☐ Joint Venture
☐ Proprietorship ☐ Fictitious Name ☐ Association
☐ Public Corporation ☐ Partnership ☐ Other Type of Business, specify below:
☐ Private Corporation ☒ Limited Partnership

Describe below the type(s) of business activities performed.
Natural gas transmission via compression.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
See Attached	Table 1			

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
See Attached	Table 2			

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
See Attached	Table 3			

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
See	Table 4					$
						$
						$
						$
						$
						$
						$
						$
						$
						$

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
See	Table 5			

<u>CONTINUING OBLIGATION</u>. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT
Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.
Glen Jasek — Signature; 12/1/22 — Date
Glen Jasek — Name (Print or Type)
Vice President GM Eastern Interstates — Title

Table 1 - General Information Regarding Applicant *

Unit	Principal Places of Business (Headquarters)	State of Incorporation	Taxpayer ID	Relationship to Applicant
Transcontinental Gas Pipe Line Company, LLC	Houston, TX	Delaware (L.L.C.)	74-1079400	Applicant
The Williams Companies, Inc.	Tulsa, OK	Delaware (Corporation)	73-0569878	Indirect percentage owner of Applicants indirect Parent Williams Partners L.P.
Williams Partners L.P.	Tulsa, OK	Delaware (Partnership)	20-2485124	Indirect Parent
Williams WPC - I, LLC	Tulsa, OK	Delaware (L.L.C.)	73-1547570	A wholly-owned subsidiary of The Williams Companies, Inc.
Laurel Mountain Midstream Operating LLC	Tulsa, OK	Delaware (L.L.C.)	27-1965151	A wholly-owned subsidiary of an indirect percentage owned indirect subsidiary of Williams Partners L.P.
Appalachia Midstream Services, L.L.C.	Oklahoma City, OK	Oklahoma (L.L.C.)	26-3678972	An indirect wholly-owned subsidiary of Williams Partners L.P.
Utica Gas Services, L.L.C.	Oklahoma City, OK	Oklahoma (L.L.C.)	61-1665331	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Pipeline Services LLC	Tulsa, OK	Delaware (L.L.C.)	73-1482302	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Field Services Company, LLC	Tulsa, OK	Delaware (L.L.C.)	73-1591878	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Energy Resources LLC	Tulsa, OK	Delaware (L.L.C.)	04-3678352	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Ohio Valley Midstream LLC	Tulsa, OK	Texas (L.L.C.)	27-0856707	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Ohio Valley Pipeline LLC	Tulsa, OK	Delaware (L.L.C.)	73-1426359	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams MLP Operating, LLC	Tulsa, OK	Delaware (L.L.C.)	27-0870752	A wholly-owned subsidiary of Williams Partners L.P.
Williams Compression LLC	Oklahoma City, OK	Oklahoma (L.L.C.)	36-4778590	An indirect wholly-owned subsidiary of Williams Partners L.P.
Williams Laurel Mountain, LLC	Tulsa, OK	Delaware (L.L.C.)	26-4577986	An indirect wholly-owned subsidiary of Williams Partners L.P.
Constitution Pipeline Company, LLC	Tulsa, OK	Delaware (L.L.C.)	30-0720382	An indirect-percentage-owned subsidiary of Williams Partners L.P.

* Entities Qualified or with Pennsylvania Operations

Table 2 - Pennsylvania Facilities

Unit	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
Transco Station 195	2204 Bryansville Rd Delta, PA 17314	Peach Bottom Township York County	(717) 456-5315	Transco
Transco Station 200	60 Bacton Hill Road Frazer, PA 19355	East Whiteland Township Chester County	(610) 644-7373	Transco
Transco Station 515	Hwy. 115 Bear Creek, PA 18602	Bear Creek Township Luzerne County	(570) 472-3242	Applicant
Transco Station 517	102 Pole Bridge Road Benton, PA 17814	Jackson Township Columbia County	(570) 925-5919	Transco
Transco Station 520	Hwy. 284 Salladasburg, PA 17740	Mifflin Township Lycoming County	(570) 398-2261	Transco
Transco Station 535	Trout Run Road Austin, PA 16720	Wharton Township Potter County	(814) 647-8800	Transco
Transco Station 605[1]	Central Penn Line North, Milepost 44.70 Clinton, PA 18419	Clinton Township Wyoming County	(570) 550-8180	Transco
Transco Station 607	78 Maransky Road, Sweet Valley, PA 18656	Fairmount Township Luzerne County	(570) 550-8007	Transco
Transco Station 610	Central Penn Line North, Milepost 112.40 Orange, PA 17859	Orange Township Columbia County	(570) 550-8100	Transco
Transco Station 620	Central Penn Line South, Milepost 80.0, Hegins, PA 17938	Hegins Township Schuylkill County	(304) 280-4598	Transco

Comments

1) Facilities utilize electric motor-driven compression and are below the applicable thresholds triggering permitting requirements for Plan Approvals or Title V permits.

Table 3 - Plan Approval/Operating Permits

Air Contamination Source	Plan Approval/ Operating Permit #	Location	Issuance Date	Expiration Date
Compressor Station 195	TVOP 67-05012	Station 195 Peach Bottom Township	9/11/13	9/30/18
Compressor Station 195	TVOP 67-05012	Station 195 Peach Bottom Township	7/19/18	7/31/23
Compressor Station 200	TVOP 15-00017	Station 200 East Whiteland Township	5/8/15	5/8/20
Compressor Station 200	TVOP 15-00017 Amendment	Station 200 East Whiteland Township	12/1/15[1]	5/8/20
Compressor Station 200	TVOP 15-00017 Revision	Station 200 East Whiteland Township	8/29/18[2]	5/8/20
Compressor Station 515	PA-40-00002A	Station 515 Buck Township	10/8/14	12/19/16[3]
Compressor Station 515	TVOP 40-00002	Station 515 Buck Township	8/28/15	9/1/20
Compressor Station 517	PA-19-00007A	Station 517 Jackson Township	9/5/14	12/20/17[4]
Compressor Station 517	TVOP 19-00007	Station 517 Jackson Township	6/26/15	6/25/20
Compressor Station 517	PA-19-00007B	Station 517 Jackson Township	2/1/17	7/16/21[5]
Compressor Station 517	PA-19-00007C	Station 517 Jackson Township	2/1/17	8/1/18
Compressor Station 517	TVOP 19-00007 Revision	Station 517 Jackson Township	1/9/18[2]	6/25/20
Compressor Station 520	PA-41-00001A	Station 520 Mifflin Township	9/5/14	11/25/16[6]
Compressor Station 520	TVOP 41-00001	Station 520 Mifflin Township	5/14/15	5/14/20
Compressor Station 520	PA-41-00001B	Station 520 Mifflin Township	6/1/17	11/26/19[8]
Compressor Station 520	PA-41-00001C	Station 520 Mifflin Township	6/13/17	11/26/19[8]
Compressor Station 520	TVOP 41-00001 Revision	Station 520 Mifflin Township	5/29/18[7]	5/14/20
Compressor Station 520	TVOP 41-00001 Modification	Station 520 Mifflin Township	6/6/18[2]	5/14/20
Compressor Station 535	TVOP 53-00002	Station 535 Wharton Township	6/9/15	6/9/20
Compressor Station 535	TVOP 53-00002	Station 535 Wharton Township	12/28/17	6/9/20
Compressor Station 607	AG5-40-00001A	Station 607 Fairmount Township	11/25/19	11/24/24
Compressor Station 607	AG5-40-00001B	Station 607 Fairmount Township	8/20/20[9]	11/24/24
Compressor Station 610	AG5-19-00001A	Station 610 Orange Township	10/28/19	10/27/24
Compressor Station 610	AG5-19-00001B	Station 610 Orange Township	6/20/20[9]	10/27/24
Compressor Station 620	AG5-54-00001A	Station 620 Hegins Township	11/25/19	11/24/24

Air Contamination Source	Plan Approval/ Operating Permit #	Location	Issuance Date	Expiration Date
Compressor Station 620	AG5-54-00001B	Station 620 Hegins Township	12/24/20[9]	11/24/24

Comments

1) Revision date to the Title V permit issued on May 8, 2015.
2) Incorporation of RACT II applicable requirements.
3) Plan Approval extensions were granted by DEP to 12/16/17.
4) Plan Approval extensions were granted by DEP to 12/20/17.
5) Plan Approval extensions were granted by DEP to 7/16/21.
6) Plan Approval extensions were granted by DEP to 11/25/16.
7) Plan Approval PA-41-00001A incorporation.
8) Plan Approval extension was granted by DEP to 11/26/19.
9) Revision of initial GP-5 issuance.

Table 4 - Documented Conduct of Violations or Enforcement Actions

Date	Location	Plan Approval/ Operating Permit Number	Nature of Documented Conduct	Type of Department Action	Status Litigation; Existing/Continuing; or Corrected/Date	Dollar Amount Penalty
N/A						

Table 5 - Documented Deviations

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
Oct 2016	Station 517	TVOP 19-00007	Exceedance of 12-month rolling hourly limitation for Source ID P110.	Corrected[1]
Dec 2016	Station 517	TVOP 19-00007	Source ID P113 was operated from 12:12 AM to 02:36 AM out of SoLoNO$_X$ mode.	Corrected[2]

Comments

1) Unit was immediately taken offline and notifications made to PADEP. Automation of data acquisition system that provides color coded warnings to control room personnel when units approach 12 CMP operating limit. Warnings provide adequate time for corrective actions to be taken before deviations occur.
2) Modifications to the control logic of the unit to limit the ability of the system to slow the unit down to the point that SoLoNO$_X$ mode cannot be maintained. Logic was tested and confirmed before placing the unit back into operation.

APPENDIX C NOTIFICATIONS

December 2022

December 12, 2022

TRANSCO PIPELINE
99 Farber Road
Princeton, NJ 08540
609-285-2407

Ricky Brown
President
Mifflin Township
207 E 1st St,
Mifflinville, PA 18631

Subject: Title V Significant Modification for RACT III Incorporation, 25 PA Code §129.115(d)(1) Waiver Request, and 25 PA Code §129.114 Alternative RACT Emission Limit Proposal
Compressor Station 520
Mifflin Township, Lycoming County, Pennsylvania
Transcontinental Gas Pipe Line Company, LLC

Dear Mr. Brown:

Pursuant to 25 *Pa. Code* §127.465, Transcontinental Gas Pipe Line Company, LLC (Transco) is submitting this Title V Significant Modification Application to the Pennsylvania Department of Environmental Protection (PADEP) to incorporate updated Reasonably Available Control Technology (RACT) requirements as promulgated in Pennsylvania Code, Title 25, Chapters 121 and 129. In addition, this application requests a waiver of the initial compliance demonstration in accordance with 25 Pa. Code §129.115(d)(1) to use prior Department-approved stack test results. Finally, this application proposes to revalidate an alternative RACT emission limit approved under RACT II.

This Title V Significant Modification is for the incorporation of new presumptive RACT requirements (RACT III) and to request minor changes to permit conditions. This application does not involve the installation or modification of air contamination sources or other equipment.

In accordance with the requirements of 25 *Pa. Code* §127.413, Transco has notified the County and Municipality, regarding this Title V Significant Modification Application.

If you have any comments or concerns regarding this Title V Significant Modification for this facility, please contact:

Mr. Muhammad Zaman
Regional Air Quality Program Manager
Department of Environmental Protection
North Central Regional Office
208 West Third Street, Suite 101
Williamsport, PA, 17701-6448

If you have any questions, please contact me at (609) 285-2407 or email at Michael.Hahn@williams.com.

Sincerely,

Michael Hahn
Environmental Specialist V

December 16, 2022

Dear Customer,

The following is the proof-of-delivery for tracking number: 770765573700

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	A.BROWN	**Delivery Location:**	
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		MIFFLINVILLE, PA,
		Delivery date:	Dec 15, 2022 15:06

Shipping Information:

Tracking number:	770765573700	**Ship Date:**	Dec 13, 2022
		Weight:	0.5 LB/0.23 KG

Recipient:	**Shipper:**
MIFFLINVILLE, PA, US,	Malvern, PA, US,

Reference	0638802.05
Department Number	Allison Stipa

Thank you for choosing FedEx

December 12, 2022

TRANSCO PIPELINE
99 Farber Road
Princeton, NJ 08540
609-285-2407

Scott Metzger
Chairman
Lycoming County
48 West Third Street
Williamsport, PA 17701

Subject: Title V Significant Modification for RACT III Incorporation, 25 PA Code §129.115(d)(1) Waiver Request, and 25 PA Code §129.114 Alternative RACT Emission Limit Proposal
Compressor Station 520
Mifflin Township, Lycoming County, Pennsylvania
Transcontinental Gas Pipe Line Company, LLC

Dear Mr. Scott Metzger:

Pursuant to 25 *Pa. Code* §127.465, Transcontinental Gas Pipe Line Company, LLC (Transco) is submitting this Title V Significant Modification Application to the Pennsylvania Department of Environmental Protection (PADEP) to incorporate updated Reasonably Available Control Technology (RACT) requirements as promulgated in Pennsylvania Code, Title 25, Chapters 121 and 129. In addition, this application requests a waiver of the initial compliance demonstration in accordance with 25 Pa. Code §129.115(d)(1) to use prior Department-approved stack test results. Finally, this application proposes to revalidate an alternative RACT emission limit approved under RACT II.

This Title V Significant Modification is for the incorporation of new presumptive RACT requirements (RACT III) and to request minor changes to permit conditions. This application does not involve the installation or modification of air contamination sources or other equipment.

In accordance with the requirements of 25 *Pa. Code* §127.413, Transco has notified the County and Municipality regarding this Title V Significant Modification Application.

If you have any comments or concerns regarding this Title V Significant Modification for this facility, please contact:

Muhammad Q. Zaman
Regional Air Quality Program Manager
PADEP Northcentral Regional Office
208 West Third Street, Suite 101
Williamsport, PA 17701-6448

If you have any questions, please contact me at (609) 285-2407 or email at Michael.Hahn@williams.com.

Sincerely,

Michael Hahn
Environmental Specialist V

December 16, 2022

Dear Customer,

The following is the proof-of-delivery for tracking number: 770765539543

Delivery Information:			
Status:	Delivered	**Delivered To:**	
Signed for by:	Signature release on file	**Delivery Location:**	
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday		WILLIAMSPORT, PA,
		Delivery date:	Dec 15, 2022 11:31

Shipping Information:			
Tracking number:	770765539543	**Ship Date:**	Dec 13, 2022
		Weight:	0.5 LB/0.23 KG

Recipient:	**Shipper:**
WILLIAMSPORT, PA, US,	Malvern, PA, US,

Reference	0638802.05
Department Number	Allison Stipa

Thank you for choosing FedEx

APPENDIX D CASE-BY-CASE COST EFFECTIVENESS ANALYSIS

December 2022

Station 520 Source ID P106 Solar SoLoNO$_x$™ Conversion Cost Analysis

Control Technology: Conversion to Solar SoLoNOx™ Lean Premix Combustion (25 ppmvd NO_x)
Emission Source: Station 520 - Source ID P106 (Solar Mars 90)
Annual Operating Hours: 2,400
Baseline Emissions[1] (tpy): 95.20
Post SoLoNO$_x$™ Conversion[2] (tpy): 15.74
Emissions Reduction (tpy): 79.46
Emissions Reduction (%): 83.46%

COST COMPONENT			COST	BASIS
DIRECT COSTS:				
	Purchased Equipment Costs (PEC)			
	Initial Equipment Costs		$ 3,885,044	Vendor Quote[3]
	Instrumentation (10% of Initial Equipment Costs)		$ 388,504	OAQPS Cost Manual (6th Ed.)
	Freight (5% of Initial Equipment Costs)		$ 213,677	OAQPS Cost Manual (6th Ed.)
	Sales Tax (8% of Initial Equipment Costs)		$ 341,884	OAQPS Cost Manual (6th Ed.)
	Subtotal - Purchased Equipment Costs (PEC)		**$ 4,829,109**	
	Direct Installation Costs (DIC)			
	Foundations & Supports, Handling & Erection, Electrical, Piping, Insulation, and Painting (30% of PEC)		$ 1,448,733	OAQPS Cost Manual (6th Ed.)
	Site Preparation / Buildings		$ -	Assumed Negligible
	Subtotal - Direct Installation Costs (DIC)		**$ 1,448,733**	
TOTAL DIRECT COSTS (TDC)			**$ 6,277,842**	
INDIRECT COSTS:				
	Engineering (10% of PEC)		$ 482,911	OAQPS Cost Manual (6th Ed.)
	Construction and Field Expenses (5% of PEC)		$ 241,455	OAQPS Cost Manual (6th Ed.)
	Contractor Fees (10% of PEC)		$ 482,911	OAQPS Cost Manual (6th Ed.)
	Start-up (2% of PEC)		$ 96,582	OAQPS Cost Manual (6th Ed.)
	Performance Testing (1% of PEC)		$ 48,291	OAQPS Cost Manual (6th Ed.)
	Contingencies (3% of PEC)		$ 144,873	OAQPS Cost Manual (6th Ed.)
TOTAL INDIRECT COSTS (TIC)			**$ 1,303,860**	
TOTAL CAPITAL INVESTMENT (TCI)			**$ 7,581,702**	**TCI = TDC + TIC**
ANNUAL DIRECT COSTS:				
	Operation and Maintenance Labor			
	Operating Labor (0 hr/shift)		$ -	Assumes no additional operational maintenance and labor costs are required.
	O&M Supervision (0 hr/day)		$ -	
	Maintenance Labor and Materials		$ -	
	Subtotal - Operation and Maintenance Labor and Materials		**$ -**	
	Utilities			
	Natural Gas		$ -	Assumed No Change
	Electricity		$ -	Assumed No Change
	Subtotal - Utilities		**$ -**	
TOTAL ANNUAL DIRECT COSTS[4]			**$ -**	
INDIRECT ANNUAL COSTS (IDAC)				
	General Overhead			
	Overhead (not applicable)		$ -	
	Property Tax (not applicable)		$ -	Assumed Negligible
	Insurance (negligible)		$ -	
	General and Administrative (not applicable)		$ -	
	Subtotal - General Overhead Expenses		**$ -**	
CAPITAL RECOVERY				
	Equipment Life (years)[5] =	15.0		Site Specific
	Interest Rate (%) =	10.00%		Specific to Williams
	Capital Recovery Factor (CRF)	0.13		OAQPS Cost Manual (6th Ed.); Eq. 2.8a
	Subtotal - Capital Recovery (CR)		**$ 996,795**	**CR = TCI * CRF**
TOTAL ANNUAL INDIRECT COSTS			**$ 996,795**	**IDAC = Overhead + Capital Recovery**

Station 520 Source ID P106 Solar SoLoNO$_x^{TM}$ Conversion Cost Analysis

TOTAL ANNUALIZED COST	**$ 996,795**	**TAC = DAC + IDAC**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)	**79.46**	
COST-EFFECTIVENESS: **ENVIRONMENTAL BASIS** **($ per ton pollutant removed)**	**$ 12,545**	

Notes:

[1] Baseline emissions are the current permit limits in Transco's Station 520 Title V Operating Permit, (Permit No. TVOP 41-00001) issued on May 14, 2015. Source ID P106 is currently permitted for 2,400 hours per year, and no change in annual operating hours is proposed.

[2] The post SoLoNO$_x^{TM}$ conversion emissions are based on Solar performance runs for a Solar Mars 90-13000S CS/MD lean premix turbine package and the current permitted annual operating hours for this turbine (2,400 hours/year). The Solar design heat rating was adjusted using a ratio of Transco's FERC Gas Tariff (Jul., 2010) HHV to Solar's simulated LHV (1,100 MMBtu/hr over 925 MMBtu/hr).

[3] The purchased equipment costs is based on a quote from Solar, provided to Williams on August 8, 2016, for a gas turbine engine overhaul exchange and SoLoNO$_x^{TM}$ conversion.

[4] Assumes no change in annual operating costs.

[5]Due to the stress, temperature, and corrosion conditions to which the Mars 90 units are subjected, the newly upgraded components will undergo deterioration over time. As such, the turbine, including its upgraded SoloNOx components will be regularly inspected and evaluated for repairs and/or replacement. The interval within which this must happen is 30,000 to 35,000 hours of cumulative runtime. In most cases, after 35,000 hours of cumulative run time, the units require a complete overhaul which includes replacement of all major components in order to continue providing safe and reliable gas compression service. Based on operational knowledge, the routine inspection and evaluation of the unit will trigger repairs and replacement of the major components such as the power turbine and gas generator sooner than 35,000 hours.

The Mars 90 turbine (Source ID P106) was installed in 1990, and due to the unit's age, the remaining useful life of the unit is limited to the time interval between occurrences of overhauls, which is 35,000 hours of cumulative run time. Factoring in the permit allowable run time of 2,400 hours, Source ID P106 will have a remaining useful life of 14.6 years after the overhaul. For purposes of this cost estimate, the the useful equipment life was rounding to the nearest integer (15 years).

Station 520 Source ID P106 SCR Design Parameters and Direct Installation Costs

Inflation Factors				
IF1	Inflation Factor (1999 to 2015)	Factor for Adjustment of Cost Manual Factors in 1999 USD to 2015 USD (Direct Equipment Costs)	1.65	Engineering News Record Construction Cost Index 2015/1998
IF2	Inflation Factor (2010 to 2015)	Ammonia Reagent in 2010 USD	1.13	
IF3	Inflation Factor (2009 to 2015)	Ammonia Slip Monitoring in 2009 USD	1.16	
IF4	Inflation Factor (2012 to 2015)	Ammonia Catalyst in 2012 USD	1.07	
Exhaust Parameters				
Q_b	Heat Input Rate (per turbine)	MMBtu/hr	105.1	Title V Permit No. 41-00001; Issued May 14, 2015
$v_{fluegas}$	Exhaust Velocity	ft/sec	51.3	Solar Performance Data
$q_{fluegas}$	Exhaust Flow	ft^3/min	135,982	Solar Performance Data
T	Operating Temperature	F	860	Solar Performance Data
AOH	Operating Hours per Year	Hours	2,400	Title V Permit No. 41-00001; Issued May 14, 2015
NO_{Xin}	Concentration in (based on 205 ppm, 15% O_2)	lb/MMBtu	0.75	Title V Permit No. 41-00001; Issued May 14, 2015
NO_{Xout}	Concentration out (based on 42 ppm, 15% O_2)	lb/MMBtu	0.15	Presumptive RACT 2 Limit
Available Cost Data				
$CC_{initial}$	Capital Cost of Ammonia Catalyst	$\$/ft^3$	$ 243.86	OAQPS Cost Manual (7th Ed.); Sec. 2-2; Adjusted w/ IF4
$CC_{NH3solu}$	Capital Cost of 29% Ammonia Solution	\$/lb	$ 0.54	EPA Costing Spreadsheet for Ammonia; Adjusted w/ IF2
Chemical Properties and Constants				
$M_{reagent}$	Ammonia MW	g/mol	17.03	OAQPS Cost Manual (7th Ed.); Table 2.2
M_{NOX}	NO_2 MW	g/mol	46.01	
$SR_{theoretical}$	Ratio of Equivalent Moles of NH_3 per Mole of Reagent Injected		0.995	OAQPS Cost Manual (7th Ed.); Table 2.2
ASR	Ratio of Equivalent Moles of NH_3 per Mole of NO_x		1.05	OAQPS Cost Manual (7th Ed.); Sec. 2.2.2 (Typical ammonia slip between 2-10ppm)
C1	Constant 1, Industry Number	ft	7	OAQPS Cost Manual (6th Ed.); Eq. 2.31
C2	Constant 2, Industry Number	ft	9	OAQPS Cost Manual (6th Ed.); Eq. 2.31
SCR Design Data				
N_{empty}	Empty Catalyst Layers		0	
h'_{layer}	Nominal Height of Each Catalyst Layer	ft	3.10	OAQPS Cost Manual (6th Ed.); Eq. 2.28
n_{scr}	Number SCR Chambers		1	
Slip	Allowable Slip	ppm	5.00	OAQPS Cost Manual (7th Ed.); Sec. 2.2.2 (Typical ammonia slip between 2-10ppm)
ΔP_{duct}	Pressure Drop due to Duct	in	3.00	OAQPS Cost Manual (7th Ed.)
$\Delta P_{catalyst}$	Pressure Drop due to Catalyst	in	1.00	OAQPS Cost Manual (7th Ed.)
$h_{catalyst}$	Operating Life of Catalyst in Hours	hours	16000	OAQPS Cost Manual (7th Ed.)
η_{NOx}	NO_X Removal Efficiency		80%	Needed to meet RACT 2 limits
$A_{catalyst}$	Cross sectional area of catalyst	ft^2	44.18	OAQPS Cost Manual (6th Ed.); Eq. 2.25
A_{SCR}	Cross sectional area of SCR reactor		50.81	OAQPS Cost Manual (6th Ed.); Eq. 2.26
T_{adj}	Temp Adjustment		1.57	OAQPS Cost Manual (6th Ed.); Eq. 2.24
$Slip_{adj}$	Slip Adjustment		1.00	OAQPS Cost Manual (6th Ed.); Eq. 2.22
NO_{Xadj}	Inlet NO_X Adjustment		1.09	OAQPS Cost Manual (6th Ed.); Eq. 2.21
η_{adj}	NO_X Efficiency Adjustment		1.13	OAQPS Cost Manual (6th Ed.); Eq. 2.20
Vol_{cat}	Volume of Catalyst	ft^3	571.28	OAQPS Cost Manual (6th Ed.); Eq. 2.19
h_{layer}	Height of catalyst layer	ft	3.59	OAQPS Cost Manual (6th Ed.); Eq. 2.29
n_{layer}	Number of catalyst layers		5	OAQPS Cost Manual (6th Ed.); Eq. 2.28
n_{total}	Total number of catalyst layers		5	OAQPS Cost Manual (6th Ed.); Eq. 2.30
h_{scr}	Height of SCR	ft	61.93	OAQPS Cost Manual (6th Ed.); Eq. 2.31
$m_{reagent}$	Mass flow of reagent	lb/hr	30.97	OAQPS Cost Manual (6th Ed.); Eq. 2.32
m_{sol}	Mass flow of solution	lb/hr	106.81	OAQPS Cost Manual (6th Ed.); Eq. 2.33 (29% Solution)
DIRECT COSTS				
f(Vol)	Catalyst Cost	\$	$ 139,310	OAQPS Cost Manual (6th Ed.); Eq. 2.43
$f(NH_3)$	Ammonia Flow Adjustment	\$/(MMBtu/hr)	$ 121	OAQPS Cost Manual (6th Ed.); Eq. 2.38 (Adusted with IF1)
$f(h_{scr})$	SCR height Adjustment	\$/(MMBtu/hr)	$ 314	OAQPS Cost Manual (6th Ed.); Eq. 2.37 (Adusted with IF1)
f(new)	New "Boiler" Adjustment	\$/(MMBtu/hr)	$ -	OAQPS Cost Manual (6th Ed.); Eq. 2.39 ($0 for a retrofit)
f(bypass)	New Bypass	\$/(MMBtu/hr)	$ 209	OAQPS Cost Manual (6th Ed.); Eq. 2.42 (Adusted with IF1)
--	Ammonia Slip Monitoring	\$	$ 81,424	Adjusted with IF3
TDC	**Total Direct Cost[1]**	**\$**	**$ 4,875,371**	**OAQPS Cost Manual (6th Ed.); Eq. 2.32 (Adjusted with IF1)**

Notes:

[1] The \$/MMBtu multiplier for the OAQPS (6th Ed.) Equation 2.32 is based on costs for a coal-fired boiler. For a more accurate direct cost estimate this value was adjusted using the EPA's Air Pollution Control Technology Fact Sheet (EPA-452/F-03-032). Adjustments were based on direct costs (\$/MMBtu) for a large gas-fired turbine (>100 MMBtu). The total direct costs were then adjusted using the appropriate inflation factor (1999 to 2015).

Station 520 Source ID P106 Selective Catalytic Reduction Indirect Costs, Annualized Costs, and Cost-Effectiveness

Control Technology:	Selective Catalytic Reduction
Emission Source:	Station 520 - Source ID P106 (Solar Mars 90)
Annual Operating Hours:	2,400
Baseline Emissions[1] (tpy):	95.20
Post SCR (tpy):	19.51
Emissions Reduction (tpy):	75.69
Emissions Reduction[2] (%):	80%

COST COMPONENT			COST	BASIS
TOTAL DIRECT COSTS (TDC)			**$ 4,875,371**	**See detailed calculations for total direct costs**
INDIRECT COSTS:				
	General Facilities (5% of TDC)		$ 243,769	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Engineering and Home Office Fees (10% of TDC)		$ 487,537	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Process Contingency (5% of TDC)		$ 243,769	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Subtotal - Indirect Costs		**$ 975,074**	
	Project Contingency (Direct + Indirect) * 15%		$ 877,567	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Total Plant Costs (Direct + Indirect + Project Contingency)		**$ 6,728,013**	**OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5**
ADDITIONAL STARTUP FEES				
	Preproduction (2% of Total Plant Costs)		$ 134,560	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Performance Testing (1% of Total Plant Costs)		$ 67,280	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
	Inventory Capital		$ 19,335	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Eq. 2-44 (Assumes 14 full days of operation)
	Subtotal - Additional Startup Fees		***$ 221,175***	
TOTAL CAPITAL INVESTMENT (TCI)			**$ 6,949,188**	
ANNUAL DIRECT COSTS:				
	Operation and Maintenance Labor			
	Operating Labor ($27.82/hr at 3 hr/8 hr shift) - Days per year were adjusted using a ratio of 2,400/8,760		$ 8,346	OAQPS Cost Manual (7th Ed.); Bureau of Labor Statistics by NAICS Code
	O&M Supervision ($44.46/hr at 1 hr/8 hr shift) - Days per year were adjusted using a ratio of 2,400/8,760		$ 4,446	OAQPS Cost Manual (7th Ed.); Bureau of Labor Statistics by NAICS Code
	Maintenance Labor and Materials (0.5% of TCI)		$ 34,746	OAQPS Cost Manual (7th Ed.); Eq. 2.57
	Subtotal - Operation and Maintenance Labor and Materials		**$ 47,538**	
	Utilities			
	Electricity:			
	Electrical Power Consumption (kW/hr)=	50.8		OAQPS Cost Manual (6th Ed.); Eq. 2.48
	Electrical Power Cost ($/kW-hr) =	0.072		US Energy Information Administration, Electric Power Monthly (Feb, 2013); Adjusted for inflation (2012 to 2015)
	Annual Electricity Cost		**$ 8,742**	**OAQPS Cost Manual (6th Ed.); Eq. 2.49**
	Reagent:			
	Reagent Solution Consumption (lb/hr) =	106.81		OAQPS Cost Manual (6th); Eq. 2.32
	Reagent Cost ($/lb) =	0.54		EPA Costing Spreadsheet for Ammonia; Adjusted w/ IF2
	Annual Reagent Cost		**$ 138,106**	**OAQPS Cost Manual (7th Ed.); Eq. 2.58**
	Subtotal - Utilities		**$ 146,848**	
TOTAL ANNUAL DIRECT COSTS			**$ 194,386**	
INDIRECT ANNUAL COSTS (IDAC)				
	General Overhead			
	Overhead (60% of Operation and Maintenance Labor)		$ 28,523	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.7
	Property Tax		$ 69,492	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.8
	Insurance		$ 69,492	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.8
	General and Administrative		$ 14,149	OAQPS Cost Manual (7th Ed.); Eq. 2.69
	Subtotal - Annual General Overhead Expenses		**$ 181,655**	

Station 520 Source ID P106 Selective Catalytic Reduction Indirect Costs, Annualized Costs, and Cost-Effectiveness

ANNUAL CATALYST REPLACEMENT				
	Catalyst Replacement Cost		$ 139,310	OAQPS Cost Manual (7th Ed.); Eq. 2.63
	Equipment Life[3] (years) =	7.0		OAQPS Cost Manual (7th Ed.)
	Interest Rate (%) =	10.00%		Site Specific
	Future Worth Factor =	0.11		OAQPS Cost Manual (7th Ed.); Eq. 2.65
	Subtotal - Annual Catalyst Replacement		**$ 14,684**	**OAQPS Cost Manual (7th Ed.); Eq. 2.64**
CAPITAL RECOVERY				
	Equipment Life[4] (years) =	15.0		Site Specific
	Interest Rate (%) =	10.00%		Specific to Williams
	Capital Recovery Factor (CRF)	0.13		OAQPS Cost Manual (7th Ed.); Eq. 2.71
	Subtotal - Capital Recovery (CR)		**$ 913,636**	**CR = TCI * CRF**
TOTAL ANNUAL INDIRECT COSTS			**$ 1,109,975**	
TOTAL ANNUALIZED COST			**$ 1,304,361**	**TAC = DAC + IDAC**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)			**75.69**	
COST-EFFECTIVENESS:				
	ENVIRONMENTAL BASIS ($ per ton pollutant removed)		**$ 17,234**	

Notes:

[1] Baseline emissions are the current permit limits in Transco's Station 520 Title V Operating Permit, (Permit No. TVOP 41-00001) issued on May 14, 2015. Source ID P106 is currently permitted for 2,400 hours per year, and no change in annual operating hours is proposed.

[2] The SCR NO_x reduction efficiency is based on the required reduction necessary to bring the outlet NOx concentration to below 42 ppmvd.

[3] The catalyst replacement duration was based on a useful life of 16,000 hours. Source ID P106 is limited to 2,400 hours of annual operation. Factoring in the annual operation yields a useful life of 6.7 years. Rounding this to the nearest integer yields a catalyst life expectancy of 7 years.

[4] Due to the stress, temperature, and corrosion conditions to which the Mars 90 unit is subjected, the life expectancy of the SCR system will be limited to the remaining life of the existing turbine. The Mars 90 turbine (Source ID P106) was installed in 1990, and due to the unit's age, the remaining useful life of the unit is limited to the time interval between occurrences of overhauls. Conservatively assuming the unit is overhauled at the time of SCR retrofit (costs for overhaul not included), the remaining useful life is approximately 35,000 hours of cumulative run time. Factoring in the permit allowable run time of 2,400 hours per year, Source ID P106 will have a remaining useful life of 14.6 years after the overhaul. Rounded this duration to the nearest interval yields a useful life of 15 years.

Station 520 Source ID P107 Solar SoLoNO$_x$™ Conversion Cost Analysis

Control Technology: Conversion to Solar SoLoNOx™ Lean Premix Combustion (25 ppmvd NO_x)
Emission Source: Station 520 - Source ID P107 (Solar Mars 90)
Annual Operating Hours: 3,360
Baseline Emissions[1] (tpy): 133.20
Post SoLoNO$_x$™ Conversion[2] (tpy): 22.04
Emissions Reduction (tpy): 111.16
Emissions Reduction (%): 83.45%

COST COMPONENT			COST	BASIS
DIRECT COSTS:				
	Purchased Equipment Costs (PEC)			
	Initial Equipment Costs		$ 3,885,044	Vendor Quote[3]
	Instrumentation (10% of Initial Equipment Costs)		$ 388,504	OAQPS Cost Manual (6th Ed.)
	Freight (5% of Initial Equipment Costs)		$ 213,677	OAQPS Cost Manual (6th Ed.)
	Sales Tax (8% of Initial Equipment Costs)		$ 341,884	OAQPS Cost Manual (6th Ed.)
	Subtotal - Purchased Equipment Costs (PEC)		**$ 4,829,109**	
	Direct Installation Costs (DIC)			
	Foundations & Supports, Handling & Erection, Electrical, Piping, Insulation, and Painting (30% of PEC)		$ 1,448,733	OAQPS Cost Manual (6th Ed.)
	Site Preparation / Buildings		$ -	Assumed Negligible
	Subtotal - Direct Installation Costs (DIC)		**$ 1,448,733**	
TOTAL DIRECT COSTS (TDC)			**$ 6,277,842**	
INDIRECT COSTS:				
	Engineering (10% of PEC)		$ 482,911	OAQPS Cost Manual (6th Ed.)
	Construction and Field Expenses (5% of PEC)		$ 241,455	OAQPS Cost Manual (6th Ed.)
	Contractor Fees (10% of PEC)		$ 482,911	OAQPS Cost Manual (6th Ed.)
	Start-up (2% of PEC)		$ 96,582	OAQPS Cost Manual (6th Ed.)
	Performance Testing (1% of PEC)		$ 48,291	OAQPS Cost Manual (6th Ed.)
	Contingencies (3% of PEC)		$ 144,873	OAQPS Cost Manual (6th Ed.)
TOTAL INDIRECT COSTS (TIC)			**$ 1,303,860**	
TOTAL CAPITAL INVESTMENT (TCI)			**$ 7,581,702**	**TCI = TDC + TIC**
ANNUAL DIRECT COSTS:				
	Operation and Maintenance Labor			
	Operating Labor (0 hr/shift)		$ -	Assumes no additional operational maintenance and labor costs are required.
	O&M Supervision (0 hr/day)		$ -	
	Maintenance Labor and Materials		$ -	
	Subtotal - Operation and Maintenance Labor and Materials		**$ -**	
	Utilities			
	Natural Gas		$ -	Assumed No Change
	Electricity		$ -	Assumed No Change
	Subtotal - Utilities		**$ -**	
TOTAL ANNUAL DIRECT COSTS[4]			**$ -**	
INDIRECT ANNUAL COSTS (IDAC)				
	General Overhead			
	Overhead (not applicable)		$ -	
	Property Tax (not applicable)		$ -	Assumed Negligible
	Insurance (negligible)		$ -	
	General and Administrative (not applicable)		$ -	
	Subtotal - General Overhead Expenses		**$ -**	
CAPITAL RECOVERY				
	Equipment Life (years)[5] =	10.0		Site Specific
	Interest Rate (%) =	10.00%		Specific to Williams
	Capital Recovery Factor (CRF)	0.16		OAQPS Cost Manual (6th Ed.); Eq. 2.8a
	Subtotal - Capital Recovery (CR)		**$ 1,233,887**	**CR = TCI * CRF**
TOTAL ANNUAL INDIRECT COSTS			**$ 1,233,887**	**IDAC = Overhead + Capital Recovery**

Station 520 Source ID P107 Solar SoLoNO$_x^{TM}$ Conversion Cost Analysis

TOTAL ANNUALIZED COST	**$ 1,233,887**	**TAC = DAC + IDAC**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)	**111.16**	
COST-EFFECTIVENESS: **ENVIRONMENTAL BASIS** **($ per ton pollutant removed)**	**$ 11,100**	

Notes:

[1] Baseline emissions are the current permit limits in Transco's Station 520 Title V Operating Permit, (Permit No. TVOP 41-00001) issued on May 14, 2015. Source ID P107 is currently permitted for 3,360 hours per year, and no change in annual operating hours is proposed.

[2] The post SoLoNO$_x^{TM}$ conversion emissions are based on Solar performance runs for a Solar Mars 90-13000S CS/MD lean premix turbine package and the current permitted annual operating hours for this turbine (3,360 hours/year). The Solar design heat rating was adjusted using a ratio of Transco's FERC Gas Tariff (Jul., 2010) HHV to Solar's simulated LHV (1,100 MMBtu/hr over 925 MMBtu/hr).

[3] The purchased equipment costs is based on a quote from Solar, provided to Williams on August 8, 2016, for a gas turbine engine overhaul exchange and SoLoNO$_x^{TM}$ conversion.

[4] Assumes no change in annual operating costs.

[5]Due to the stress, temperature, and corrosion conditions to which the Mars 90 units are subjected, the newly upgraded components will undergo deterioration over time. As such, the turbine, including its upgraded SoloNOx components will be regularly inspected and evaluated for repairs and/or replacement. The interval within which this must happen is 30,000 to 35,000 hours of cumulative runtime. In most cases, after 35,000 hours of cumulative run time, the units require a complete overhaul which includes replacement of all major components in order to continue providing safe and reliable gas compression service. Based on operational knowledge, the routine inspection and evaluation of the unit will trigger repairs and replacement of the major components such as the power turbine and gas generator sooner than 35,000 hours.

The Mars 90 turbine (Source ID P107) was installed in 1993, and due to the unit's age, the remaining useful life of the unit is limited to the time interval between occurrences of overhauls, which is 35,000 hours of cumulative run time. Factoring in the permit allowable run time of 3,360 hours, Source ID P107 will have a remaining useful life of 10.4 years after the overhaul. For purposes of this cost estimate, the the useful equipment life was rounding to the nearest integer (10 years).

Station 520 Source ID P107 SCR Design Parameters and Direct Installation Costs

Inflation Factors				
IF1	Inflation Factor (1999 to 2015)	Factor for Adjustment of Cost Manual Factors in 1999 USD to 2015 USD (Direct Equipment Costs)	1.65	Engineering News Record Construction Cost Index 2015/1998
IF2	Inflation Factor (2010 to 2015)	Ammonia Reagent in 2010 USD	1.13	
IF3	Inflation Factor (2009 to 2015)	Ammonia Slip Monitoring in 2009 USD	1.16	
IF4	Inflation Factor (2012 to 2015)	Ammonia Catalyst in 2012 USD	1.07	
Exhaust Parameters				
Q_b	Heat Input Rate (per turbine)	MMBtu/hr	105.1	Title V Permit No. 41-00001; Issued May 14, 2015
$v_{fluegas}$	Exhaust Velocity	ft/sec	52.9	Solar Performance Data
$q_{fluegas}$	Exhaust Flow	ft^3/min	140,117	Solar Performance Data
T	Operating Temperature	F	850	Solar Performance Data
AOH	Operating Hours per Year	Hours	3,360	Title V Permit No. 41-00001; Issued May 14, 2015
NO_{Xin}	Concentration in (based on 205 ppm, 15% O_2)	lb/MMBtu	0.75	Title V Permit No. 41-00001; Issued May 14, 2015
NO_{Xout}	Concentration out (based on 42 ppm, 15% O_2)	lb/MMBtu	0.15	Presumptive RACT 2 Limit
Available Cost Data				
$CC_{initial}$	Capital Cost of Ammonia Catalyst	$/$ft^3$	$ 243.86	OAQPS Cost Manual (7th Ed.); Sec. 2-2; Adjusted w/ IF4
$CC_{NH3solu}$	Capital Cost of 29% Ammonia Solution	$/lb	$ 0.54	EPA Costing Spreadsheet for Ammonia; Adjusted w/ IF2
Chemical Properties and Constants				
$M_{reagent}$	Ammonia MW	g/mol	17.03	OAQPS Cost Manual (7th Ed.); Table 2.2
M_{NOX}	NO_2 MW	g/mol	46.01	
$SR_{theoretical}$	Ratio of Equivalent Moles of NH_3 per Mole of Reagent Injected		0.995	OAQPS Cost Manual (7th Ed.); Table 2.2
ASR	Ratio of Equivalent Moles of NH_3 per Mole of NO_x		1.05	OAQPS Cost Manual (7th Ed.); Sec. 2.2.2 (Typical ammonia slip between 2-10ppm)
C1	Constant 1, Industry Number	ft	7	OAQPS Cost Manual (6th Ed.); Eq. 2.31
C2	Constant 2, Industry Number	ft	9	OAQPS Cost Manual (6th Ed.); Eq. 2.31
SCR Design Data				
N_{empty}	Empty Catalyst Layers		0	
h'_{layer}	Nominal Height of Each Catalyst Layer	ft	3.10	OAQPS Cost Manual (6th Ed.); Eq. 2.28
n_{scr}	Number SCR Chambers		1	
Slip	Allowable Slip	ppm	5.00	OAQPS Cost Manual (7th Ed.); Sec. 2.2.2 (Typical ammonia slip between 2-10ppm)
ΔP_{duct}	Pressure Drop due to Duct	in	3.00	OAQPS Cost Manual (7th Ed.)
$\Delta P_{catalyst}$	Pressure Drop due to Catalyst	in	1.00	OAQPS Cost Manual (7th Ed.)
$h_{catalyst}$	Operating Life of Catalyst in Hours	hours	16000	OAQPS Cost Manual (7th Ed.)
η_{NOx}	NO_X Removal Efficiency		80%	Needed to meet RACT 2 limits
$A_{catalyst}$	Cross sectional area of catalyst	ft^2	44.18	OAQPS Cost Manual (6th Ed.); Eq. 2.25
A_{SCR}	Cross sectional area of SCR reactor		50.81	OAQPS Cost Manual (6th Ed.); Eq. 2.26
T_{adj}	Temp Adjustment		1.49	OAQPS Cost Manual (6th Ed.); Eq. 2.24
$Slip_{adj}$	Slip Adjustment		1.00	OAQPS Cost Manual (6th Ed.); Eq. 2.22
NO_{Xadj}	Inlet NO_X Adjustment		1.09	OAQPS Cost Manual (6th Ed.); Eq. 2.21
η_{adj}	NO_X Efficiency Adjustment		1.13	OAQPS Cost Manual (6th Ed.); Eq. 2.20
Vol_{cat}	Volume of Catalyst	ft^3	543.99	OAQPS Cost Manual (6th Ed.); Eq. 2.19
h_{layer}	Height of catalyst layer	ft	4.08	OAQPS Cost Manual (6th Ed.); Eq. 2.29
n_{layer}	Number of catalyst layers		4	OAQPS Cost Manual (6th Ed.); Eq. 2.28
n_{total}	Total number of catalyst layers		4	OAQPS Cost Manual (6th Ed.); Eq. 2.30
h_{scr}	Height of SCR	ft	53.31	OAQPS Cost Manual (6th Ed.); Eq. 2.31
$m_{reagent}$	Mass flow of reagent	lb/hr	30.97	OAQPS Cost Manual (6th Ed.); Eq. 2.32
m_{sol}	Mass flow of solution	lb/hr	106.81	OAQPS Cost Manual (6th Ed.); Eq. 2.33 (29% Solution)
DIRECT COSTS				
f(Vol)	Catalyst Cost	$	$ 132,656	OAQPS Cost Manual (6th Ed.); Eq. 2.43
$f(NH_3)$	Ammonia Flow Adjustment	$/(MMBtu/hr)	$ 121	OAQPS Cost Manual (6th Ed.); Eq. 2.38 (Adusted with IF1)
$f(h_{scr})$	SCR height Adjustment	$/(MMBtu/hr)	$ 228	OAQPS Cost Manual (6th Ed.); Eq. 2.37 (Adusted with IF1)
f(new)	New "Boiler" Adjustment	$/(MMBtu/hr)	$ -	OAQPS Cost Manual (6th Ed.); Eq. 2.39 ($0 for a retrofit)
f(bypass)	New Bypass	$/(MMBtu/hr)	$ 209	OAQPS Cost Manual (6th Ed.); Eq. 2.42 (Adusted with IF1)
--	Ammonia Slip Monitoring	$	$ 81,424	Adjusted with IF3
TDC	**Total Direct Cost[1]**	**$**	**$ 4,837,611**	**OAQPS Cost Manual (6th Ed.); Eq. 2.32 (Adjusted with IF1)**

Notes:

[1] The $/MMBtu multiplier for the OAQPS (6th Ed.) Equation 2.32 is based on costs for a coal-fired boiler. For a more accurate direct cost estimate this value was adjusted using the EPA's Air Pollution Control Technology Fact Sheet (EPA-452/F-03-032). Adjustments were based on direct costs ($/MMBtu) for a large gas-fired turbine (>100 MMBtu). The total direct costs were then adjusted using the appropriate inflation factor (1999 to 2015).

Station 520 Source ID P107 Selective Catalytic Reduction Indirect Costs, Annualized Costs, and Cost-Effectiveness

Control Technology:	Selective Catalytic Reduction
Emission Source:	Station 520 - Source ID P107 (Solar Mars 90)
Annual Operating Hours:	3,360
Baseline Emissions[1] (tpy):	133.20
Post SCR (tpy):	27.30
Emissions Reduction (tpy):	105.90
Emissions Reduction[2] (%):	80%

COST COMPONENT		COST	BASIS
TOTAL DIRECT COSTS (TDC)		**$ 4,837,611**	**See detailed calculations for total direct costs**
INDIRECT COSTS:			
General Facilities (5% of TDC)		$ 241,881	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Engineering and Home Office Fees (10% of TDC)		$ 483,761	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Process Contingency (5% of TDC)		$ 241,881	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Subtotal - Indirect Costs		**$ 967,522**	
Project Contingency (Direct + Indirect) * 15%		$ 870,770	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Total Plant Costs (Direct + Indirect + Project Contingency)		**$ 6,675,904**	**OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5**
ADDITIONAL STARTUP FEES			
Preproduction (2% of Total Plant Costs)		$ 133,518	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Performance Testing (1% of Total Plant Costs)		$ 66,759	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Table 2.5
Inventory Capital		$ 19,335	OAQPS Cost Manual (6th Ed.); Sec. 4.2; Eq. 2-44 (Assumes 14 full days of operation)
Subtotal - Additional Startup Fees		***$ 219,612***	
TOTAL CAPITAL INVESTMENT (TCI)		**$ 6,895,516**	
ANNUAL DIRECT COSTS:			
Operation and Maintenance Labor			
Operating Labor ($27.82/hr at 3 hr/8 hr shift) - Days per year were adjusted using a ratio of 3,360/8,760		$ 11,684	OAQPS Cost Manual (7th Ed.); Bureau of Labor Statistics by NAICS Code
O&M Supervision ($44.46/hr at 1 hr/8 hr shift) - Days per year were adjusted using a ratio of 3,360/8,760		$ 6,224	OAQPS Cost Manual (7th Ed.); Bureau of Labor Statistics by NAICS Code
Maintenance Labor and Materials (0.5% of TCI)		$ 34,478	OAQPS Cost Manual (7th Ed.); Eq. 2.57
Subtotal - Operation and Maintenance Labor and Materials		**$ 52,386**	
Utilities			
Electricity:			
Electrical Power Consumption (kW/hr)=	45.2		OAQPS Cost Manual (6th Ed.); Eq. 2.48
Electrical Power Cost ($/kW-hr) =	0.072		US Energy Information Administration, Electric Power Monthly (Feb, 2013); Adjusted for inflation (2012 to 2015)
Annual Electricity Cost		**$ 10,908**	**OAQPS Cost Manual (6th Ed.); Eq. 2.49**
Reagent:			
Reagent Solution Consumption (lb/hr) =	106.81		OAQPS Cost Manual (6th); Eq. 2.32
Reagent Cost ($/lb) =	0.54		EPA Costing Spreadsheet for Ammonia; Adjusted w/ IF2
Annual Reagent Cost		**$ 193,348**	**OAQPS Cost Manual (7th Ed.); Eq. 2.58**
Subtotal - Utilities		**$ 204,257**	
TOTAL ANNUAL DIRECT COSTS		**$ 256,643**	
INDIRECT ANNUAL COSTS (IDAC)			
General Overhead			
Overhead (60% of Operation and Maintenance Labor)		$ 31,432	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.7
Property Tax		$ 68,955	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.8
Insurance		$ 68,955	OAQPS Cost Manual (6th Ed.); Sec. 2.5.5.8
General and Administrative		$ 14,142	OAQPS Cost Manual (7th Ed.); Eq. 2.69
Subtotal - Annual General Overhead Expenses		**$ 183,484**	

Station 520 Source ID P107 Selective Catalytic Reduction Indirect Costs, Annualized Costs, and Cost-Effectiveness

ANNUAL CATALYST REPLACEMENT				
	Catalyst Replacement Cost		$ 132,656	OAQPS Cost Manual (7th Ed.); Eq. 2.63
	Equipment Life[3] (years) =	5.0		OAQPS Cost Manual (7th Ed.)
	Interest Rate (%) =	10.00%		Site Specific
	Future Worth Factor =	0.16		OAQPS Cost Manual (7th Ed.); Eq. 2.65
	Subtotal - Annual Catalyst Replacement		**$ 21,729**	**OAQPS Cost Manual (7th Ed.); Eq. 2.64**
CAPITAL RECOVERY				
	Equipment Life[4] (years) =	10.0		Site Specific
	Interest Rate (%) =	10.00%		Specific to Williams
	Capital Recovery Factor (CRF)	0.16		OAQPS Cost Manual (7th Ed.); Eq. 2.71
	Subtotal - Capital Recovery (CR)		**$ 1,122,213**	**CR = TCI * CRF**
TOTAL ANNUAL INDIRECT COSTS			**$ 1,327,426**	
TOTAL ANNUALIZED COST			**$ 1,584,069**	**TAC = DAC + IDAC**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)			**105.90**	
COST-EFFECTIVENESS:	**ENVIRONMENTAL BASIS ($ per ton pollutant removed)**		**$ 14,959**	

Notes:

[1] Baseline emissions are the current permit limits in Transco's Station 520 Title V Operating Permit, (Permit No. TVOP 41-00001) issued on May 14, 2015. Source ID P107 is currently permitted for 3,360 hours per year, and no change in annual operating hours is proposed.

[2] The SCR NO_x reduction efficiency is based on the required reduction necessary to bring the outlet NOx concentration to below 42 ppmvd.

[3] The catalyst replacement duration was based on a useful life of 16,000 hours. Source ID P107 is limited to 3,360 hours of annual operation. Factoring in the annual operation yields a useful life of 4.8 years. Rounding this to the nearest integer yields a catalyst life expectancy of 5 years.

[4] Due to the stress, temperature, and corrosion conditions to which the Mars 90 unit is subjected, the life expectancy of the SCR system will be limited to the remaining life of the existing turbine. The Mars 90 turbine (Source ID P107) was installed in 1993, and due to the unit's age, the remaining useful life of the unit is limited to the time interval between occurrences of overhauls. Conservatively assuming the unit is overhauled at the time of SCR retrofit (costs for overhaul not included), the remaining useful life is approximately 35,000 hours of cumulative run time. Factoring in the permit allowable run time of 3,360 hours per year, Source ID P107 will have a remaining useful life of 10.4 years after the overhaul. Rounded this duration to the nearest interval yields a useful life of 10 years.

RBLC	Facility Name	County	State	Permit Number	SIC Code	NAICS Code	Permit Issuance Date	Facility Description	Process Name	Fuel Type	Unit Rating	Unit	Pollutant	Control Method	Emission Limit 1	Units	Case-by-Case Applicability
LA-0331	CALCASIEU PASS LNG PROJECT	CAMERON	LA	PDS-LA-805	4925	221210	9/21/2018	New Liquefied Natural Gas (LNG) production, storage, and export terminal.	Aeroderivative Simple Cycle Combustion Turbine	Natural Gas	30	MW	VOC	Proper Equipment Design, Proper Operation, and Good Combustion Practices.	1.5	PPMV	BACT-PSD
LA-0331	CALCASIEU PASS LNG PROJECT	CAMERON	LA	PDS-LA-805	4925	221210	9/21/2018	New Liquefied Natural Gas (LNG) production, storage, and export terminal.	Aeroderivative Simple Cycle Combustion Turbine	Natural Gas	30	MW	NOx	Selective Catalytic Reduction (SCR), exclusive combustion of fuel gas, and good combustion practices.	25	PPMV	BACT-PSD
*AK-0085	GAS TREATMENT PLANT	NORTH SLOPE BOROUGH	AK	AQ1524CPT01	4922	486210	8/13/2020	Natural Gas Processing Plant	Six (6) Simple Cycle Gas-Turbines (Power Generation)	Natural Gas	44	MW	NOx	DLN combustors and Good Combustion Practices	15	PPMV @ 15% O2	BACT-PSD
LA-0331	CALCASIEU PASS LNG PROJECT	CAMERON	LA	PDS-LA-805	4925	221210	9/21/2018	New Liquefied Natural Gas (LNG) production, storage, and export terminal.	Simple Cycle Combustion Turbines (SCCT1 to SCCT3)	Natural Gas	80	MW	NOx	Dry Low NOx Combustor Design, Good Combustion Practices, and Natural Gas Combustion.	9	PPMV	BACT-PSD
LA-0331	CALCASIEU PASS LNG PROJECT	CAMERON	LA	PDS-LA-805	4925	221210	9/21/2018	New Liquefied Natural Gas (LNG) production, storage, and export terminal.	Simple Cycle Combustion Turbines (SCCT1 to SCCT3)	Natural Gas	80	MW	VOC	Proper Equipment Design, Proper Operation, and Good Combustion Practices.	1.4	PPMV	BACT-PSD

APPENDIX E APPLICATION FEE

December 2022

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR QUALITY FEES SCHEDULE

There are four different Fees Schedules.

1. Fees Schedule for New Plan Approval
2. Fees Schedule for Pending or Issued Plan Approval
3. Fees Schedule for State-Only Operating Permit
4. Fees Schedule for Title V Operating Permit

If the company is submitting a new plan approval application, the fees schedule for a “New Plan Approval” should be used. In this form, the company should check the appropriate boxes depending on the types of review requested and pay accordingly.

Similarly, if the company is submitting an Operating Permit application, the company should use the respective fees schedule for an Operating Permit, check all the appropriates boxes, and pay the fees required.

Please make the check payable to the “Commonwealth of Pennsylvania Clean Air Fund.” Submit this fees schedule and the check with the application package to the appropriate regional office.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR QUALITY FEES FOR NEW PLAN APPROVAL

Company Information	
Federal Tax ID:	Firm Name:
Permit # (If any):	Facility Name:
Municipality:	County:
Contact Person Name:	Telephone Number:
E-mail:	

New Plan Approval (The following fees are cumulative.)

Line #	Check the appropriate boxes below	Type of review requested	Fee 2021 - 2025	Total Fees
1	Base Fee	Subchapter B	$2,500	$2,500
2	☐	New Source Review, Subchapter E	$7,500	
3	☐	NSPS/NESHAP /MACT standard A. # of NSPS: _____ B. # of NESHAP/MACT: _____ C. Add lines A and B: _____ D. Maximum applicable standards: 3 E. Enter smaller of line C or line D: _____ Multiply line E by $2,500 and enter the amount in the "Total Fees" column.	$2,500	
4	☐	Case-by-Case MACT	$9,500	
5	☐	Prevention of Significant Deterioration (PSD) requirements. Subchapter D	$32,500	
6	☐	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	$7,500	
7	☐	Risk Assessment Analysis – Inhalation only	$10,000	
8	☐	Risk Assessment Analysis – Multi-pathway	$25,000	
Add Lines 1 thru 8 of Total Fees column and write it here. →				

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR QUALITY FEES FOR PENDING* OR ISSUED** PLAN APPROVAL

Company Information	
Federal Tax ID:	Firm Name:
Permit # (If any):	Facility Name:
Municipality:	County:
Contact Person Name:	Telephone Number:
E-mail:	

Pending or Issued Plan Approval *				
Line #	**Check the appropriate boxes below**	**Type of Authorization**	**Fee 2021 - 2025**	**Total Fees**
1	☐	Minor Modification	$1,500	
2	☐	Extension	$750	
3	☐	Transfer of Ownership	$750	
4	☐	Significant Modification, Ambient Impact Analysis	$9,000	
5	☐	Significant Modification, Reassessment of Control Technology	$2,500	

* Pending plan approval is such that the Department has completed the technical review and published a notice in the *Pennsylvania Bulletin*. This is applicable only to Lines 4 and 5.

** Issued plan approval is such that the conditions of the plan approval have not been incorporated into an operating permit.

*** Pay maximum amount of fee when one or more authorizations are requested. For example, when a minor modification of a plan approval and a transfer of ownership are needed, please pay only the highest amount of fee ($1,500).

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR QUALITY FEES FOR STATE-ONLY OPERATING PERMIT (NON-TITLE V)

Company Information	
Federal Tax ID:	Firm Name:
Permit # (If any):	Facility Name:
Municipality:	County:
Contact Person Name:	Telephone Number:
E-mail:	

State-Only Operating Permit				
Line #	**Check the appropriate box below**	**Type of Authorization**	**Fee 2021 - 2025**	**Total Fees**
1	☐	New Application, Subchapter F	$2,500	
2	☐	Renewal	$2,100	
3	☐	Minor Modification	$1,500	
4	☐	Significant Modification	$2,000	
5	☐	Administrative Amendment / Change of Ownership	$1,500	

Pay maximum amount of fee when one or more authorizations are requested. For example, when a renewal application and a change of ownership forms are submitted, please pay only the highest amount of fee ($2,100).

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

QUALITY FEES FOR TITLE V OPERATING PERMIT

Company Information	
Federal Tax ID: 74-1079400	Firm Name: : TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
Permit # (If any): 15-00017	Facility Name: TRANSCONTINENTAL GAS/SALLADASBURG STATION 520
Municipality: Mifflin Township	County: Lycoming
Contact Person Name: Michael Hahn	Telephone Number: (609) 285-2407
E-mail: Michael.Hahn@williams.com	

Title V Operating Permit

Line #	Check the appropriate box below	Type of Authorization	Fee 2021 - 2025	Total Fees
1	☐	New Application, Subchapter G	$5,000	
2	☐	Renewal	$4,000	
3	☐	Minor Modification	$1,500	
4	☒	Significant Modification	$4,000	$4,000
5	☐	Administrative Amendment / Change of Ownership	$1,500	
6	☐	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	$10,000	

Pay maximum amount of fee when one or more authorizations are requested. For example, when a renewal application and a change of ownership forms are submitted, please pay only the highest amount of fee ($4,000).

Environmental Resources Management, Inc.

VENDOR CHECK NUMBER 134756

ERM. Account Number: 103116 134756

PLEASE DETACH AND RETAIN FOR YOUR RECORDS

INVOICE NUMBER	DATE		VOUCHER NO.	AMOUNT
STA 520 CHK REQ	12/06/22		396315	4,000.00

TOTAL: 4,000.00

THIS DOCUMENT CONTAINS HEAT SENSITIVE INK. TOUCH OR PRESS RED LOGO NEAR SIGNATURE LINE - RED IMAGE DISAPPEARS WITH HEAT.

Environmental Resources Management, Inc.
75 Valley Stream Parkway, Suite 200
Malvern, PA 19355-1406

134756

WELLS FARGO

134756

11-24
1210

DATE: 09-December-2022

NO.

PAY FOUR THOUSAND AND XX / 100 DOLLARS $ **********4,000.00