pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHWEST REGIONAL OFFICE – AIR QUALITY PROGRAM **MEMO**

TO Air Quality Permit File PA-63-00922D

FROM
Alexander Sandy/AS
Air Quality Engineering Specialist
Air Quality Program

Andrew W. Fleck/AWF
Environmental Group Manager
Air Quality Modeling Section
Division of Air Resource Management

THROUGH
Edward F. Orris, P.E./EFO
Environmental Engineer Manager
Air Quality Program

Mark R. Gorog, P.E./MRG
Regional Manager
Air Quality Program

DATE June 11, 2021

RE Comment and Response Document
Robinson Power Company, LLC
Beech Hollow Project / Combined Cycle Gas Turbine Electric Generating Facility
Robinson Township, Washington County
Permit Decision: Approved
Public Comment Period: May 30, 2020 – June 29, 2020 (EPA June 2, 2020 – July 17, 2020
APS 893311 Auth 1261667 PF 650405

Background

On February 8, 2019, the Department received a plan approval application from Burns and McDonnell Engineering Company, Inc. (BMcD) on behalf of Robinson Power Company, LLC (Robinson Power) to modify the proposed natural gas-fired combined cycle power plant with a nominal capacity of 1,000 MW to be located in Robinson Township, Washington County. This site is located just south and west of US Route 22 and State Route 980 respectively (40°24’33”N, 80°17’53”W), and approximately 2.5 miles northeast of the town of Bulger. Review of the submitted application has been completed by the Department and the public comment period has expired. This memo documents the continued review since the Department’s review memo was finalized.

The notice of intent to issue the plan approval was sent to the applicant on May 20, 2020, and the applicant published the notice in the *Observer-Reporter* on May 23, 24, and 26, 2020, in accordance with 25 Pa. Code § 127.44(c). Proof of publication was provided by the applicant on June 8, 2020. Notice of intent to issue the plan approval was published in the *Pennsylvania Bulletin* on May 30, 2020, beginning the 30-day public comment period, in accordance with 25 Pa. Code § 127.44(c).

On June 2, 2020, the Department sent notice of intent to issue the plan approval to the United States Environmental Protection Agency (EPA), any states within 50 miles of the proposed facility, and any state whose air quality may be affected and that is contiguous to this Commonwealth (Maryland, West Virginia, and Ohio). On June 2, 2020, the Department also sent the draft plan approval and review memorandum to the applicant, EPA, National Park Service and Forest Service, West Virginia DEP, Ohio EPA, Maryland DOE, the Department's Operations Staff (Elizabeth Speicher and Scott Beaudway), and the Department's Modeling Section (Andrew Fleck). The draft plan approval, review memo, and Air Quality modeling analysis were also added to the Department's website on June 2, 2020, at:

https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Robinson-Power.aspx.

The link to the Department's website where the documents are available was provided to those who had requested the draft plan approval and review memorandum.

Since being published, additional information was received from the applicant on November 20, 2020, and March 12, 2021.

Received comments are substantively addressed in this document below the list of commentators. Comments have been identified, summarized, and categorized where possible. Numbers in parentheses following each comment identify to which commentators the comment applies. Because this action pertains to the review of an application for an Air Quality Plan Approval, this document primarily focuses on issues that are germane to the air quality aspects of the project and not those outside of the purview of this review.

List of Commentators

1. Cathy Lodge
   Washington, County, PA; Residents Against the Power Plant

2. Patrice Tomcik
   Moms Clean Air Force

3. Suzanne Staggenborg
   Allegheny County, PA

4. Rajani Vaidyanathan
   Allegheny County, PA

5. Isabel C. Pintado
   Allegheny County, PA

6. Barbara Litt
   Allegheny County, PA

7. Mark Fabian
   Allegheny County, PA

8. Gillian Graber
   Westmoreland County, PA

9. Kenneth Bickel
   Allegheny County, PA

10. Paul Brown
    Allegheny County, PA

11. Carol Thompson
    Allegheny County, PA

12. Jessica Stephenson
    Allegheny County, PA

13. Karen Knutson
    Allegheny County, PA

14. Chet Smolenski
    Westmoreland County, PA

15. Peter Adams

Allegheny County, PA

16. John Detwiler
    Allegheny County, PA

17. Andrew Johnson
    Allegheny County, PA

18. Richard Johnson
    Clearfield County, PA

19. Don Dixon
    Allegheny County, PA

20. Thomas Geinzer
    Westmoreland County, PA

21. Jay Walker
    Allegheny County, PA

22. Gaye Fifer
    Allegheny County, PA

23. Martine Jacobs
    Allegheny County, PA

24. Harry Hochheiser
    Allegheny County, PA

25. Diane Kokowski
    Allegheny County, PA

26. Laurel Person Mecca
    Allegheny County, PA

27. Kathleen Nicholas
    Allegheny County, PA

28. Kate Sherman
    Allegheny County, PA

29. Doris Dick
    Allegheny County, PA

30. Al Ferrucci

Allegheny County, PA

31. Daniel Rubel
Allegheny County, PA

32. Debra Fyock
Allegheny County, PA

33. Barbara Brandom
Allegheny County, PA

34. Thomas Crown
Allegheny County, PA

35. Carin Mincemoyer
Allegheny County, PA

36. Lacey Love
Washington County, PA

37. Morgan Dysert
Washington County, PA

38. Karen Dysert
Washington County, PA

39. Laura Horowitz
Allegheny County, PA

40. Zak Dysert
Washington County, PA

41. Fayten El-Dehaibi
Allegheny County, PA

42. Mykie Reidy
Allegheny County, PA

43. Maurice Samuels
Allegheny County, PA

44. Michael Lawrence
Westmoreland County, PA

45. Christopher D. Ahlers

Staff Attorney, Clean Air Counsel

46. Joseph Otis Minott, Esq.
    Executive Director and Chief Counsel, Clean Air Counsel

47. Adam Kron
    Senior Attorney, Environmental Integrity Project

48. Lisa Graves Marcucci
    PA Coordinator, Community Outreach; Environmental Integrity Project

49. Benjamin Kunstman
    Staff Engineer, Environmental Integrity Project

50. John K. Baillie
    Senior Attorney, Group Against Smog and Pollution

51. Mary Cate Opila, P.E., Ph.D.
    Physical Scientist, U.S. Environmental Protection Agency Region 3

52. David Sidick
    Washington County, PA

53. Stephanie Ulmer
    Allegheny County, PA

54. Laura Horowitz
    Allegheny County, PA

55. Eileen STEDING
    Washington County, PA

56. Mark Fichman
    Allegheny County, PA

57. jeff evans
    Jefferson County, OH

58. Sharon Kessler
    Allegheny County, PA

59. Jeanette Bussen
    Beaver County, PA

60. Regina Brooks

Allegheny County, PA

61. Nick Milam
Allegheny County, PA

62. Brian Snyder
Allegheny County, PA

63. Sanford Leuba
Allegheny County, PA

64. Terrie Baumgardner
Beaver County, PA

65. Annette Shimer
Allegheny County, PA

66. Jay Walker
Allegheny County, PA

67. Finula Mccaul
Allegheny County, PA

68. Katherine Rubel
Allegheny County, PA

69. Peg Schmdit
Allegheny County, PA

70. Don Dixon
Allegheny County, PA

71. Alice Stehle
Butler County, PA

72. Fayten El-Dehaibi
Allegheny County, PA

73. Linda Schmidt
Allegheny County, PA

74. Al Ferrucci
Allegheny County, PA

75. Kathleen Nicholas

Allegheny County, PA

76. Kenneth Bickel
Allegheny County, PA

77. Bob Nishikawa
Allegheny County, PA

78. Constantina Hanse
Allegheny County, PA

79. Barbara White
Allegheny County, PA

80. Carol Mokwa
Allegheny County, PA

81. Tim Ivers
Allegheny County, PA

82. Jessica Bellas
Allegheny County, PA

83. Carol Thompson
Allegheny County, PA

84. Peter Adams
Allegheny County, PA

85. Olivia Perfetti
Allegheny County, PA

86. Mari McShane
Allegheny County, PA

87. Tatyana Gershkovich
Allegheny County, PA

88. Evelyn Och
Allegheny County, PA

89. Michael Lawrence
Allegheny County, PA

90. PHILIP PANDOLFI

Allegheny County, PA

91. Ruth Fauman-Fichman
Allegheny County, PA

92. Darlene Dech
Allegheny County, PA

93. Tom Mastrilli
Butler County, PA

94. Garret Wassermann
Allegheny County, PA

COMMENTS AND RESPONSES

Air Dispersion Modeling

Clean Air Council and Environmental Integrity Project Comments Received July 17, 2020

1. **Comment (Comment 1 from CAC and EIP on July 17, 2020):** The Department Should Require a More Complete Analysis of Additional Impacts as a Result of Growth Associated with the Facility. (45 – 49)

   Response: Robinson Power's March 2017 revision to its air quality analysis, submitted as part of its initial application for Plan Approval 63-00922D, includes an assessment of "general commercial, residential, industrial and other growth" associated with the Beech Hollow Energy facility in section 8.9 (Additional Impact Analysis), as required by the Prevention of Significant Deterioration (PSD) regulations in 40 CFR § 52.21(o). Section 2.0 of Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019), submitted to the DEP as part of the current application for modification to Plan Approval 63-00922D, states, "[t]he conclusions of the construction, vegetation, and soil impacts analysis performed for the PSD Air Permit Application Update dated March 2017 have not changed and will not be updated for the permit minor modification request."

   The DEP concurs with Robinson Power's assessment of "general commercial, residential, industrial and other growth" associated with the Beech Hollow Energy facility. Such growth would be negligible and "secondary emissions" associated with this growth, defined by the PSD regulations in 40 CFR § 52.21(b)(18), would also be negligible. Chapter A, section II.B.4 of the U.S. Environmental Protection Agency's (EPA) "New Source Review Workshop Manual" (Draft, October 1990) states, "[i]n order to be considered [in the PSD analyses], however, secondary emissions must be specific, well-defined, quantifiable, and impact the same general area as the stationary source or modification undergoing review." Secondary emissions associated with the Beech Hollow Energy facility do not meet these criteria. Secondary emissions are therefore not included in the additional impact analyses, required by the PSD regulations in 40 CFR § 52.21(o) for impairment to visibility, soils, and vegetation, and would not be included in any cumulative impact analyses, required by the PSD regulations in 40 CFR § 52.21(k) for the National Ambient Air Quality Standards (NAAQS) and PSD increments, had the impacts of the Beech Hollow Energy facility's emissions been greater than the EPA's significant impact levels (SIL).

   Also see response to Comment 10

2. **Comment (Comment 2 from CAC and EIP on July 17, 2020):** The Department Should Require a More Complete Analysis of Air Modeling, Including a Complete Analysis of Significant Impact Levels. (45 – 49; additional similar comments from 52 – 94)

   Response: Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019) was submitted to the DEP as a revision to Attachment D (Air Dispersion Modeling Analysis) of its February 2019 application for modification to Plan Approval 63-00922D. Robinson Power conducted all air dispersion modeling as required by the Prevention of Significant

Deterioration (PSD) regulations in 40 CFR § 52.21(k) through (n) and compared its dispersion modeling results to the U.S. Environmental Protection Agency's (EPA) significant impact levels (SIL) for each PSD-applicable pollutant and averaging time.

All electronic data files submitted to the DEP by Robinson Power for its August 2019 air dispersion modeling were transmitted to the commentators on August 3, 2020, via an internet-based file sharing service. These files included input and output data associated with AERMOD for the Class II and Class I SIL analyses, the AERMAP terrain preprocessor, the AERMET meteorological preprocessor (including the AERMINUTE and AERSURFACE programs), and BPIPPRM building downwash preprocessor.

A. **Comment (Comment 2A from CAC and EIP on July 17, 2020):** The Department Should Require Additional Significance Modeling (e.g., for Comparison to Significant Impact Levels (SILs).

Response: The DEP believes the commentators have misinterpreted the U.S. Environmental Protection Agency's (EPA) April 17, 2018, memorandum "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program" relevant to "inherent variability in the air quality in the area surrounding a monitoring site." This "inherent variability" provided the analytical foundation and basis of development for the EPA's recommended PM-2.5 significant impact levels (SIL) and is relevant to observed ambient monitoring concentrations. Neither the EPA's April 17, 2018, memorandum nor its associated document, "Technical Basis for the EPA's Development of the Significant Impact Thresholds for PM2.5 and Ozone" (EPA-454/R-18-001, April 2018), and legal memorandum, "Application of Significant Impact Levels in the Air Quality Demonstration for Prevention of Significant Deterioration Permitting under the Clean Air Act," state that the permitting authority should consider "inherent variability" in its application of the PM-2.5 SILs.

Robinson Power's air dispersion modeling sufficiently demonstrates that the impacts of the Beech Hollow Energy facility's emissions are less than the 24-hour and annual PM-2.5 SILs for the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments and therefore would not cause or contribute to air pollution in violation of the PM-2.5 NAAQS and PM-2.5 Class II and Class I PSD increments. There is no basis for requiring Robinson Power to conduct additional dispersion modeling to determine cumulative, multi-source impacts for comparison to the PM-2.5 NAAQS and PSD increments.

B. **Comment (Comment 2B from CAC and EIP on July 17, 2020):** The Facility Has Not Demonstrated the Appropriateness of a Comparison to a Facility in Tuscarawas County, Ohio.

Response: The commentators reference the February 2019 version of Robinson Power's application for modification to Plan Approval 63-00922D. Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019) was submitted to the DEP as a revision to Attachment D (Air Dispersion Modeling Analysis) of its February 2019 application for modification to Plan Approval 63-00922D. Section 1.7 (Secondary Formation Analysis) of Robinson Power's August 2019 submittal updates section 1.6 (Secondary Formation Analysis) of its February 2019 submittal by incorporating guidance from the U.S. Environmental Protection

Agency's (EPA) "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program" (EPA-454/R-19-003, April 2019). In its April 2019 MERPs guidance and associated MERPs View Qlik webpage (https://www.epa.gov/scram/merps-view-qlik), the EPA presents photochemical modeling results of PM-2.5 precursor emissions from hypothetical sources, not actual sources, that may be used in calculating single-source secondary PM-2.5 impacts. Robinson Power's updated section 1.7 provides justification for using the Tuscarawas County, OH hypothetical source for calculating secondary PM-2.5 formation due to its emissions of PM-2.5 precursors, NO_X and SO_2, in accordance with the EPA's April 2019 MERPs guidance. The Tuscarawas County, OH hypothetical source, which is located approximately 94 kilometers west of the proposed location of the Beech Hollow Energy facility, has stack heights similar to those proposed for the Beech Hollow Energy facility and is surrounded by similar terrain and land cover.

In response to this comment, the DEP re-calculated secondary PM-2.5 impacts due to the Beech Hollow Energy facility's emissions of PM-2.5 precursors based on the Tuscarawas County, OH hypothetical source. The DEP also calculated secondary PM-2.5 impacts due to the Beech Hollow Energy facility's emissions of PM-2.5 precursors based on the Allegheny County, PA, hypothetical source, located approximately 28 kilometers east of the proposed location of the Beech Hollow Energy facility.

The Beech Hollow Energy facility's emissions of PM-2.5 precursors for each source, along with the stack heights used in Robinson Power's air dispersion modeling, are summarized in the following table:

Table 1: Beech Hollow Energy Facility's Emissions of PM-2.5 Precursors[1]

Emission Source(s)	Stack Height	NO_X Emissions	SO_2 Emissions
	m	tpy	tpy
2 combustion turbines	82.296	229.96	35.92
1 auxiliary boiler	82.296	0.91	0.05
2 dew point gas heaters	7.620	0.68	0.03
1 fire water pump	9.144	0.13	0.04

[1] Source: Letter with attachments dated October 25, 2019, from Mary Hauner-Davis, Burns & McDonnell Engineering Company, Inc. to Alexander Sandy, DEP Southwest Regional Office. See Attachment A – Overall Final Emissions Estimates, "Overall Project Emissions" page, "Maximum Annual Emission Rates" table.

Results of the EPA's photochemical modeling for each hypothetical source are summarized in the following tables:

Table 2: Results of EPA's Photochemical Modeling for Tuscarawas County, OH Hypothetical Source with 500 Tons per Year of Precursor Emissions[1]

Metric	Precursor	Stack Height	Maximum Concentration
		m	$\mu g/m^3$
Daily PM-2.5	NO_X	90	0.040317796
		10	0.085064537
	SO_2	90	0.083801203

		10	0.253579795
Annual PM-2.5	NO_X	90	0.001761418
		10	0.005771979
	SO_2	90	0.004123237
		10	0.009208703

[1] Source: Data downloaded from EPA's MERPs View Qlik webpage (https://www.epa.gov/scram/merps-view-qlik).

Table 3: Results of EPA's Photochemical Modeling for Allegheny County, PA Hypothetical Source with 1,000 Tons per Year of Precursor Emissions1

Metric	Precursor	Stack Height	Maximum Concentration
		m	$\mu g/m^3$
Daily PM-2.5	NO_X	90	0.079527915
		10	0.137566403
	SO_2	90	0.251444310
		10	0.471163899
Annual PM-2.5	NO_X	90	0.006136423
		10	0.012118237
	SO_2	90	0.008695263
		10	0.012909221

[1] Source: Data downloaded from EPA's MERPs View Qlik webpage (https://www.epa.gov/scram/merps-view-qlik).

In its calculations, the DEP applied the maximum concentrations for the 90-meter hypothetical source stack to the emissions from the combustion turbines and auxiliary boiler and applied the maximum concentrations for the 10-meter hypothetical source stack to the emissions from the dew point gas heaters and fire water pump.

The DEP's calculations of secondary PM-2.5 impacts due to the Beech Hollow Energy facility's emissions of PM-2.5 precursors based on each hypothetical source are detailed below:

Calculation of Secondary 24-hour PM-2.5 Impact Using Tuscarawas County, OH Hypothetical Source

Secondary 24-hour PM-2.5 Impact Due to NO_X =
[(229.96 tpy NO_X + 0.91 tpy NO_X) * (0.040317796 $\mu g/m^3$ / 500 tpy NO_X)] +
[(0.68 tpy NO_X + 0.13 tpy NO_X) * (0.085064537 $\mu g/m^3$ / 500 tpy NO_X)]
= 0.018754144 $\mu g/m^3$

Secondary 24-hour PM-2.5 Impact Due to SO_2 =
[(35.92 tpy SO_2 + 0.05 tpy SO_2) * (0.083801203 $\mu g/m^3$ / 500 tpy SO_2)] +
[(0.03 tpy SO_2+ 0.04 tpy SO_2) * (0.253579795 $\mu g/m^3$ / 500 tpy SO_2)]
= 0.006064160 $\mu g/m^3$

Total Secondary 24-hour PM-2.5 Impact = 0.024818303 $\mu g/m^3$

Calculation of Secondary Annual PM-2.5 Impact Using Tuscarawas County, OH Hypothetical Source

Secondary Annual PM-2.5 Impact Due to NO_X =
[(229.96 tpy NO_X + 0.91 tpy NO_X) * (0.001761418 µg/m^3 / 500 tpy NO_X)] +
[(0.68 tpy NO_X + 0.13 tpy NO_X) * (0.005771979 µg/m^3 / 500 tpy NO_X)]
= 0.000822668 µg/m^3

Secondary Annual PM-2.5 Impact Due to SO_2 =
[(35.92 tpy SO_2 + 0.05 tpy SO_2) * (0.004123237 µg/m^3 / 500 tpy SO_2)] +
[(0.03 tpy SO_2+ 0.04 tpy SO_2) * (0.009208703 µg/m^3 / 500 tpy SO_2)]
= 0.000297915 µg/m^3

Total Secondary Annual PM-2.5 Impact = 0.001120583 µg/m^3

Calculation of Secondary 24-hour PM-2.5 Impact Using Allegheny County, PA Hypothetical Source

Secondary 24-hour PM-2.5 Impact Due to NO_X =
[(229.96 tpy NO_X + 0.91 tpy NO_X) * (0.079527915 µg/m^3 / 1,000 tpy NO_X)] +
[(0.68 tpy NO_X + 0.13 tpy NO_X) * (0.137566403 µg/m^3 / 1,000 tpy NO_X)]
= 0.018472039 µg/m^3

Secondary 24-hour PM-2.5 Impact Due to SO_2 =
[(35.92 tpy SO_2 + 0.05 tpy SO_2) * (0.251444310 µg/m^3 / 1,000 tpy SO_2)] +
[(0.03 tpy SO_2+ 0.04 tpy SO_2) * (0.471163899 µg/m^3 / 1,000 tpy SO_2)]
= 0.009077433 µg/m^3

Total Secondary 24-hour PM-2.5 Impact = 0.027549472 µg/m^3

Calculation of Secondary Annual PM-2.5 Impact Using Allegheny County, PA Hypothetical Source

Secondary Annual PM-2.5 Impact Due to NO_X =
[(229.96 tpy NO_X + 0.91 tpy NO_X) * (0.006136423 µg/m^3 / 1,000 tpy NO_X)] +
[(0.68 tpy NO_X + 0.13 tpy NO_X) * (0.012118237 µg/m^3 / 1,000 tpy NO_X)]
= 0.001426532 µg/m^3

Secondary Annual PM-2.5 Impact Due to SO_2 =
[(35.92 tpy SO_2 + 0.05 tpy SO_2) * (0.008695263 µg/m^3 / 1,000 tpy SO_2)] +
[(0.03 tpy SO_2+ 0.04 tpy SO_2) * (0.012909221 µg/m^3 / 1,000 tpy SO_2)]
= 0.000313672 µg/m^3

Total Secondary Annual PM-2.5 Impact = 0.001740204 µg/m^3

The DEP's calculations of secondary PM-2.5 impacts due to the Beech Hollow Energy facility's emissions of PM-2.5 precursors based on each hypothetical source are summarized in the following table:

Table 4: DEP Calculation of Secondary PM-2.5 Impacts Due to Beech Hollow Energy Facility's Emissions of PM-2.5 Precursors

Hypothetical Source	Averaging Time	Secondary PM-2.5 Due to NO_X	Secondary PM-2.5 Due to SO_2	Total Secondary PM-2.5
		µg/m^3	µg/m^3	µg/m^3
Tuscarawas County, OH	24-hour	0.018754144	0.006064160	0.024818303
	Annual	0.000822668	0.000297915	0.001120583
Allegheny County, PA	24-hour	0.018472039	0.009077433	0.027549472
	Annual	0.001426532	0.000313672	0.001740204

The Department's calculated secondary PM-2.5 impacts using the EPA's photochemical modeling results for the Tuscarawas County, OH hypothetical source are nearly identical to Robinson Power's calculated impacts of 0.025 µg/m^3 and 0.00112 µg/m^3 for the 24-hour and annual averaging times, respectively. Furthermore, the Department's calculated secondary PM-2.5 impacts using the Tuscarawas County, OH hypothetical source are similar to its calculated impacts using the Allegheny County, PA hypothetical source even through the Allegheny County, PA hypothetical source is surrounded by a greater percentage of urban land cover. Since the Department's calculated secondary PM-2.5 impacts using the Allegheny County, PA hypothetical source are slightly higher, the DEP conservatively uses these impacts in its response to the commentators' July 17, 2020, Comment 2E and July 31, 2020, Comment 2.

Additionally, the Beech Hollow Energy facility's potential emissions of SO_2 are less than the SO_2 "significant" emission rate (SER) defined in the Prevention of Significant Deterioration (PSD) regulations in 40 CFR § 52.21(b)(23)(i). Section II.2 of the EPA's "DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling" (EPA-457/P-20-002, February 2020) clarifies that "[o]nly precursors of O_3 or $PM_{2.5}$ that would by themselves be emitted by the source in a significant amount are included in the air quality analysis." SO_2 emissions are therefore conservatively included in the calculation of secondary PM-2.5 impacts by both Robinson Power and the Department, in its response to this comment.

Regarding ammonia emissions as a precursor for secondary PM-2.5 formation, see the Department's response to the commentators' July 17, 2020, Comment 2D.

C. **Comment (Comment 2C from CAC and EIP on July 17, 2020):** The Department Should Require Additional Monitoring for Background Concentrations.

Response: The commentators reference the February 2019 version of Robinson Power's application for modification to Plan Approval 63-00922D. Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019) was submitted to the DEP as a revision to Attachment D (Air Dispersion Modeling Analysis) of its February 2019 application for modification to Plan Approval 63-00922D. Section 1.3.8 (Preconstruction Monitoring) of Robinson

Power's August 2019 submittal updates section 1.3.8 (Preconstruction Monitoring) of its February 2019 submittal by incorporating PM-2.5 ambient monitoring data measured at the DEP's Florence monitor (Site ID: 42-125-5001) to fulfill the requirements of the Prevention of Significant Deterioration (PSD) regulations in 40 CFR 52.21(m) to establish existing ambient air quality for PM-2.5 in the area that the Beech Hollow Energy facility would affect. The Florence monitor is located approximately 11 kilometers west-northwest of the proposed location of the Beech Hollow Energy facility in Hillman State Park. Robinson Power used the Florence monitor for the same purpose in its PSD air quality analysis to support its initial application for Plan Approval 63-00922D.

Robinson Power conservatively utilized the 24-hour and annual PM-2.5 2016-2018 design values based on data measured at the Florence monitor to help support the conclusion that the impacts of the Beech Hollow Energy facility's emissions of PM-2.5 and PM-2.5 precursors, which were calculated by AERMOD to be below the PM-2.5 significant impact levels (SIL) for the National Ambient Air Quality Standards (NAAQS), would not cause or contribute to violations of the NAAQS, without having to conduct cumulative impact analyses. The PM-2.5 2016-2018 and 2017-2019 design values for the Department's Florence monitor are listed in the following table:

Table 5: PM-2.5 Design Values for DEP's Florence Monitor

Averaging Time	Monitor Site/ID	2016-2018 Design Value	2017-2019 Design Value	NAAQS
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
24-hour	DEP Florence/ 42-125-5001	16.7[1]	17.9	35
Annual		7.5[2]	7.9	12

[1] Design value was corrected by the DEP. Robinson Power reported a 24-hour design value of 17.7 $\mu g/m^3$.
[2] Design value was corrected by the DEP. Robinson Power reported an annual design value of 8.2 $\mu g/m^3$.

Robinson Power was exempted from the PSD pre-construction ambient monitoring requirements of 40 CFR 52.21(m) for CO, NO_2, and PM-10 since the impacts of the Beech Hollow Energy facility's emissions were calculated by AERMOD to be less than the 8-hour CO, annual NO_2, and 24-hour PM-10 significant monitoring concentrations (SMC) listed in the PSD regulations in 40 CFR § 52.21(b)(23)(i). Furthermore, there are currently no ambient monitors statewide with measured CO, NO_2, or PM-10 concentrations in which the NAAQS are threatened, even in areas with emissions greater than the emissions in the area that the Beech Hollow Energy facility would affect. This finding was used by the DEP to help support the conclusion that the impacts of the Beech Hollow Energy facility's emissions of CO, NO_X, and PM-10, which were calculated by AERMOD to be below the respective SILs, would not cause or contribute to violations of the NAAQS, without having to conduct cumulative impact analyses. The maximum CO, NO_2, and PM-10 2017-2019 design values based on data measured at ambient monitors within Pennsylvania are listed in the following table:

Table 6: Maximum CO, NO_2, and PM-10 2017-2019 Design Values for Ambient Monitors Within Pennsylvania

Pollutant	Averaging Time	Agency/Monitor Site/ID	Maximum 2017-2019	NAAQS	Percent of NAAQS

			Design Value		
CO	1-hour	ACHD[1]/Wilkinsburg/ 42-003-1376	6.030 ppm	35 ppm	17.2 %
	8-hour		3.7 ppm	9 ppm	41.1 %
NO_2	1-hour	PAMS[2]/Montgomery Dr./ 42-101-0076	44.2 ppb	100 ppb	44.2 %
	Annual	PAMS[2]/Grant Ave. & James St./42-101-0075	13.43 ppb	53 ppb	25.3 %
PM-10	24-hour	ACHD[1]/Lincoln/ 42-003-7004	91 µg/m^3	150 µg/m^3	60.7 %

[1] Allegheny County Health Department.
[2] Philadelphia Department of Public Health/Air Management Services.

All electronic data files submitted to the DEP by Robinson Power for its August 2019 air dispersion modeling were transmitted to the commentators on August 3, 2020, via an internet-based file sharing service.

D. **Comment (Comment 2D from CAC and EIP on July 17, 2020):** The Department Should Require the Facility to Include Air Emissions of Ammonia (NH_3) in the Air Modeling.

Response: Robinson Power is not required to account for ammonia emissions as a precursor to PM-2.5 formation in its air quality analyses for Prevention of Significant Deterioration (PSD). The U.S. Environmental Protection Agency's (EPA) May 16, 2008, Final Rule (73 FR 28321), "Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$)" and August 24, 2016, Final Rule (81 FR 58010), "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements" do not require the regulation of ammonia as a precursor to PM-2.5 for the PSD program. The federal PSD regulations, codified in 40 CFR § 52.21, are adopted and incorporated by reference in their entirety in 25 Pa. Code § 127.83 and the Commonwealth's State Implementation Plan (SIP) codified in 40 CFR § 52.2020. Pennsylvania, therefore, does not regulate ammonia as a precursor to PM-2.5 formation for the PSD program. Furthermore, the EPA has not published guidance for calculating secondary formation of PM-2.5 due to emissions of ammonia from a single source for the PSD program.

According to additional information provided by the applicant on November 20, 2020:

> "Ammonia (NH_3) is not a criteria pollutant under Federal or State regulations and PADEP does not require modeling of NH_3 for permitting purposes. With regard to secondary $PM_{2.5}$ formation, the Clean Air Fine Particle Implementation Rule effective 5/24/2007 [Error by applicant: The Rule became effective May 29, 2007; 72 FR 20585] discusses policy toward NH_3 as a $PM_{2.5}$ precursor. From the rule:
>
> "*In the final rule, ammonia is presumed not to be a PM2.5 attainment plan precursor, meaning that the State is not required to address ammonia in its attainment plan or evaluate sources of*

> *ammonia emissions for reduction measures. This presumption can be reversed based on an acceptable technical demonstration for a particular area by the State or EPA. If a technical demonstration by the State or EPA shows that ammonia emissions from sources in the State significantly contribute to PM2.5 concentrations in a given nonattainment area, the State must then evaluate and consider control strategies for reducing ammonia emissions in its nonattainment SIP due in 2008, in the implementation of the PM2.5 program.*"
>
> Unless the State specifically requires ammonia to be included as a $PM_{2.5}$ attainment plan precursor [Note by the Department: Pennsylvania has not done so.], it is not necessary to include ammonia in this analysis. Additionally, the Project is not located in a $PM_{2.5}$ nonattainment area.
>
> A secondary $PM_{2.5}$ analysis was performed for the Project according to the methodology presented by the EPA in Guidance on the Development of Modeled Emission Rates for Precursors (MERPS) as a Tier I Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program. The MERPS methodology was used to determine whether secondary impacts cause or contribute to a violation of the NAAQS for $PM_{2.5}$. EPA performed modeling for secondary $PM_{2.5}$ from NOx and SO_2 but did not perform modeling for NH_3 to be included in secondary $PM_{2.5}$ analyses. Because the applicant performed the Tier I demonstration to assess secondary $PM_{2.5}$ impacts according to EPA guidance and demonstrated that air quality thresholds would not be exceeded, no further modeling should be required."

In further support (although a different area), according to *Demonstration of NH3 Precursor Contributions to PM2.5 in the San Joaquin Valley*[1] dated April 15, 2019:

> "…This report describes the results of the District modeling analysis and demonstrates that NH3 is not a significant precursor to PM2.5 concentrations in the Valley and provides the technical basis for exempting NH3 from the Clean Air Act NNSR requirements under Clean Air Act §189(e) and 40 CFR 51.165(a)(13) ..."

Ammonia emissions are the result of ammonia slip (unreacted ammonia) through the selective catalytic reduction (SCR) system. SCR reduces NOx emissions by reacting ammonia with exhaust gas NOx to yield nitrogen and water vapor in the presence of a catalyst. BAT to reduce the amount of ammonia slip has been determined to be proper design, operation, and maintenance of the SCR control devices for the minimization of ammonia slip in conjunction with maximization of NOx reduction to meet the proposed NOx LAER limit. Proper design includes selecting the catalyst material, size, and location such that it is capable of operating within the designed temperature range; and locating and configuring NH_3 injection points to ensure proper mixing of NH_3 with NOx. Proper operation includes operating the combustion turbines such that the exhaust gas temperature stays within the designed temperature range of the catalyst (500 - 700°F once the exhaust reaches the catalyst, which will be optimized during design according to the application) and injecting sufficient NH_3 to promote the reaction of NOx with injected NH_3. Proper maintenance includes periodic cleaning and/or replacement of the catalyst to keep activity high and promote the reaction of NOx with injected NH_3. The plan approval includes an ammonia slip limit from the combustion turbines

[1] http://www.valleyair.org/workshops/postings/2019/04-15-19_rules/nh3.pdf

of 5.0 ppmvd @ 15% O_2 on a 3-hour average which will be monitored by CEMS. The plan approval also includes an annual facility-wide ammonia emission limit.

E. **Comment (Comment 2E from CAC and EIP on July 17, 2020):** In its Air Modeling, the Facility Should Consider the Impacts in the Fine Particulate Nonattainment Area in Allegheny County – A Short Distance Away.

Response: Robinson Power's dispersion modeling receptor domain consists of a 24-kilometer by 24-kilometer receptor grid centered on the proposed location of the Beech Hollow Energy facility. The receptor grid is adequate to capture the maximum impacts due to the Beech Hollow Energy facility's emissions, including its PM-2.5 emissions. Approximately 39% of the area covered by Robinson Power's receptor grid is within Allegheny County and the Allegheny County line is approximately 1.4 kilometers from the proposed location of the Beech Hollow Energy facility.

All of Allegheny County is designated nonattainment for the 2012 annual PM-2.5 National Ambient Air Quality Standard (NAAQS). However, only the Liberty-Clairton portion of Allegheny County, which is approximately 35 kilometers from the proposed location of the Beech Hollow Energy facility, is designated as nonattainment for the 2006 24-hour PM-2.5 NAAQS. Area designations for Allegheny County, as codified in 40 CFR § 81.339, are summarized in the following table:

Table 7: PM-2.5 Area Designations for Allegheny County

PM-2.5 NAAQS	Allegheny County (All)	Allegheny County (Part)[1]	Allegheny County (Remainder)[2]
1997 24-hour	-----	Unclassifiable/Attainment	Unclassifiable/Attainment
2006 24-hour	-----	Nonattainment	Attainment
1997 Annual	-----	Nonattainment	Attainment
2012 Annual	Nonattainment	-----	-----

[1] Liberty-Clairton portion of Allegheny County consists of Lincoln Borough, Clairton City, Glassport Borough, Liberty Borough, and Port Vue Borough.
[2] All areas of Allegheny County outside of Liberty-Clairton portion.

The PM-2.5 significant impact levels (SIL), relevant to Nonattainment New Source Review applicability requirements, are codified in 25 *Pa. Code* § 127.203(a). The PM-2.5 SILs are 1.2 $\mu g/m^3$ and 0.2 $\mu g/m^3$ for the 24-hour and annual PM-2.5 NAAQS, respectively.

All electronic data files submitted to the DEP by Robinson Power for its August 2019 air dispersion modeling were transmitted to the commentators on August 3, 2020, via an internet-based file sharing service. The electronic data files include AERMOD "plot files" with a .GRF filename extension. Each model run includes a "plot file" that contains a list of each model receptor along with its corresponding maximum concentration. The 24-hour and annual PM-2.5 concentrations, including the secondary PM-2.5 impacts, at all model receptors within Allegheny County are less than the respective PM-2.5 SIL. Even with the slightly higher, more conservative secondary PM-2.5 impacts calculated by the DEP using the EPA's photochemical modeling results for the Allegheny County, PA hypothetical source in response to the commentators' July 17, 2020, Comment 2B, the 24-hour

and annual PM-2.5 concentrations at all model receptors within Allegheny County are less than the respective PM-2.5 SIL.

F. **Comment (Comment 2F from CAC and EIP on July 17, 2020):** The Facility Has Not Provided Adequate Support for its Disregard of Local Meteorological Data in Favor of Data at the Airport, Which Would Have a Material Impact on Meeting the Significant Impact Levels.

Response: The Department fully addresses this comment in its responses to the commentators' July 31, 2020, Comment 1 and Comment 2, which are similar to and expand on this comment.

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3. **Comment (General):** On the thumb drive provided to the Council on the day the comments were due [July 17, 2020], the Department did not provide all the requested air modeling documents. Accordingly, on July 28, 2020 the Council requested copies of the Class II air modeling files, the BPIP-Prime files, and all the meteorology files. *See* Attachment 1 -- Email from Clean Air Council to the Department, dated July 28, 2020. The Department has not responded to this request.

Response: All electronic data files submitted to the Department by Robinson Power for its August 2019 air dispersion modeling were transmitted to the commentators on August 3, 2020, via an internet-based file sharing service. These files included input and output data associated with AERMOD for the Class II and Class I significant impact level (SIL) analyses, the AERMAP terrain preprocessor, the AERMET meteorological preprocessor (including the AERMINUTE and AERSURFACE programs), and BPIPPRM building downwash preprocessor.

4. **Comment (Comment 1 from CAC and EIP on July 31, 2020):** In disregard of EPA's Guidance Document, the Applicant Fails to Provide a Justification for Basing its Modeled Impact on a Land Use Dataset from the Airport, Rather Than on a Land Use Dataset from the Project Site. (45 – 49)

Response: The Department disagrees with the commentators' assertion that Robinson Power disregarded the U.S. Environmental Protection Agency's (EPA) guidance. Robinson Power's air dispersion modeling utilized a representative meteorological dataset derived from surface and upper air data from Pittsburgh International Airport (KPIT), which is located approximately 11 kilometers northeast of the proposed location of the Beech Hollow Energy facility. Section 3.1.1 (Meteorological data representativeness consideration) of the EPA's "AERMOD Implementation Guide" (EPA-454/B-19-035, August 2019) states, "the determination of representativeness should include a comparison of the surface characteristics (i.e., z_o, B_o and r) between the NWS measurement site and the source location, coupled with a determination of the importance of those differences relative to predicted concentrations" and "[i]f the reviewing agency is uncertain as to the representativeness of a meteorological measurement site, a site-specific sensitivity analysis may be needed in order to quantify, in terms of expected changes in the design concentration, the significance of the differences in each of the surface characteristics."

Robinson Power's March 2017 revision to its air quality analysis, submitted as part of its initial application for Plan Approval 63-00922D, includes a comparison of the surface characteristics in the vicinity of the KPIT meteorological site and the proposed location of the Beech Hollow Energy facility in section 8.3 (Meteorological Data), Figure 8-3 (Seasonal and Sector Comparison of Surface Roughness Length), and Figure 8-4 (Seasonal Comparison of Albedo and Bowen Ratio), as suggested by section 3.1.1 of the EPA's "AERMOD Implementation Guide" (EPA-454/B-19-035, August 2019). This surface characteristics comparison did not change with respect to Robinson Power's current application for modification to Plan Approval 63-00922D. Furthermore, at the request of the DEP, section 1.3.5.1 (Sensitivity Analysis) of Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019) includes a surface characteristics "sensitivity analysis," as suggested by section 3.1.1 of the EPA's "AERMOD Implementation Guide" (EPA-454/B-19-035, August 2019).

In its surface characteristics "sensitivity analysis," Robinson Power compared the modeled impacts of its emissions utilizing the KPIT meteorological dataset processed with surface characteristics input representative of land cover in the vicinity of KPIT's meteorological tower with the modeled impacts of its emissions utilizing the KPIT meteorological dataset processed with surface characteristics input representative of land cover in the vicinity of the proposed location of the Beech Hollow Energy facility. This comparison was conducted "to quantify, in terms of expected changes in the design concentration, the significance of the differences in each of the surface characteristics." The difference in concentration is less than the EPA's significant impact level (SIL), with respect to each pollutant and averaging time. As discussed in the EPA's April 17, 2018, memorandum "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program," pages 10-11, air quality concentrations that are less than the SIL are considered small and not meaningful "because changes of this magnitude are well within the inherent variability of observed design values." The differences in each of the surface characteristics, in terms of concentration, is therefore small and not meaningful. The KPIT meteorological dataset, from a surface characteristics perspective, is therefore representative of atmospheric conditions in the vicinity of the proposed location of the Beech Hollow Energy facility.

The objective of Robinson Power's surface characteristics "sensitivity analysis" was to compare the difference in concentration to the respective SIL, not the concentration resulting from each meteorological dataset to the respective SIL. Furthermore, section 8.4.2(b) of the EPA's "Guideline on Air Quality Models" (40 CFR Part 51, Appendix W) states, "[t]he EPA recommends that the surface characteristics input to AERMET should be representative of the land cover in the vicinity of the meteorological data, i.e., the location of the meteorological tower for measured data …." Robinson Power's air dispersion modeling results, summarized in Table 1-10 (Maximum Modeled Concentrations for Significance Modeling) of its "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019), are therefore based the KPIT meteorological dataset processed with surface characteristics input representative of land cover in the vicinity of KPIT's meteorological tower.

5. **Comment (Comment 2 from CAC and EIP on July 31, 2020):** The Applicant's Sensitivity Analysis Identifies a Material Difference in Modeled Impacts for Fine Particulates Across the Two Datasets, Underscoring the Flawed Approach. (45 – 49)

Response: The Department addresses the commentators' concerns in this comment regarding Robinson Power's surface characteristics "sensitivity analysis" in its response to the commentators' July 31, 2020, Comment 1.

To further address the commentators' concerns regarding PM-2.5 impacts in Robinson Power's surface characteristics "sensitivity analysis," the Department reprocessed the Pittsburgh International Airport (KPIT) meteorological dataset with AERMET v19191 using surface characteristics input that was calculated with the U.S. Environmental Protection Agency's (EPA) most recent version of its AERSURFACE tool, v20060, released on April 7, 2020. AERSURFACE v20060 has the capability to process the U.S. Geological Survey (USGS) National Land Cover Dataset (NLCD) impervious surface and tree canopy data, in addition to land cover data. AERSURFACE v20060 also has the capability to process more recent 2016 data from the NLCD, which are temporally more representative of land cover for the KPIT meteorological dataset's 2013-2017 period. Furthermore, AERSURFACE 20060 has the capability to define each sector's land use within the surface roughness length study area as either "airport" or "non-airport."

The Department then re-executed Robinson Power's surface characteristics "sensitivity analysis" Class II area model runs for PM-2.5 using AERMOD v19191. The PM-2.5 impacts calculated by AERMOD are slightly lower using the KPIT meteorological data processed with AERSURACE v20060 than those listed in Table 1-5 of Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019), except the annual PM-2.5 impact for the Class II Prevention of Significant Deterioration (PSD) increment significant impact level (SIL) using the KPIT meteorological dataset processed with surface characteristics input representative of land cover in the vicinity of KPIT's meteorological tower, which is slightly higher. Each difference in concentration is less than the respective SIL. The Department's model results are summarized in the following table:

Table 8: DEP Results of Revised Robinson Power Surface Characteristics "Sensitivity Analysis" for PM-2.5 NAAQS and Class II PSD Increment Using KPIT Meteorological Dataset Processed with AERMET v19191 with ADJ_U* Option and AERSURFACE v20060

Averaging Time	Standard	Maximum Modeled Concentration		Concentration Difference	NAAQS & Class II PSD Increment SIL
		With KPIT Surface Characteristics	With Robinson Power Surface Characteristics		
		µg/m^3	µg/m^3	µg/m^3	µg/m^3
24-hour	NAAQS	0.84317	1.05171	0.20854	1.2
	Increment	1.13434	1.72537	0.59103	
Annual	NAAQS	0.05637	0.12075	0.06438	0.2
	Increment	0.06132	0.12717	0.06585	

The Department then re-evaluated Robinson Power's use of the KPIT meteorological dataset, processed with the surface friction velocity adjustment (ADJ_U*) option in AERMET, in the air dispersion modeling to support its current application for modification to Plan Approval 63-00922D. Robinson Power did not utilize the ADJ_U* option in its March 2017 revision to its air quality analysis, submitted as part of its initial application for Plan Approval 63-00922D. The ADJ_U* option is intended to

address concerns regarding AERMOD's performance, i.e., overprediction of concentrations during stable low wind speed meteorological conditions, by adjusting the surface friction velocity based on Qian and Venkatram (2011).[2] The DEP reprocessed the KPIT meteorological dataset using AERMET v19191 in default mode, i.e., without the ADJ_U* option and AERSURFACE v20060, and re-executed Robinson Power's surface characteristics "sensitivity analysis" Class II area model runs for PM-2.5 using AERMOD v19191. Seemingly contrary to the intent of the ADJ_U* option, the PM-2.5 impacts calculated by AERMOD are slightly lower using the KPIT meteorological data processed with AERMET in default mode than with the ADJ_U* option, except the annual PM-2.5 impact for the National Ambient Air Quality Standard (NAAQS) SIL using the KPIT meteorological dataset processed with surface characteristics input representative of land cover in the vicinity of KPIT's meteorological tower, which is slightly higher. Each difference in concentration is less than the respective SIL. The Department's model results are summarized in the following table:

Table 9: DEP Results of Revised Robinson Power Surface Characteristics "Sensitivity Analysis" for PM-2.5 NAAQS and Class II PSD Increment Using KPIT Meteorological Dataset Processed with AERMET v19191 in Default Mode and AERSURFACE v20060

Averaging Time	Standard	Maximum Modeled Concentration		Concentration Difference	NAAQS & Class II PSD Increment SIL
		With KPIT Surface Characteristics	With Robinson Power Surface Characteristics		
		µg/m^3	µg/m^3	µg/m^3	µg/m^3
24-hour	NAAQS	0.83916	0.87383	0.03467	1.2
	Increment	1.12286	1.16152	0.03866	
Annual	NAAQS	0.05623	0.09782	0.04159	0.2
	Increment	0.06121	0.10364	0.04243	

If the Department's more conservative secondary 24-hour and annual PM-2.5 impacts using the Allegheny County, PA hypothetical source of 0.027549472 µg/m^3 and 0.001740204 µg/m^3, respectively, calculated in response to the commentators' July 17, 2020, Comment 2B, are added to the DEP's model results in the table above, each concentration remains less than the respective SIL.

Additionally, the PM-2.5 concentrations listed in the tables above, and those listed in Robinson Power's "Revised Air Dispersion Modeling Analysis and Additional Impacts Analysis" (August 2019), are associated with emission scenarios in which the combustion turbines are assumed in AERMOD to be operating at partial capacity for every hour of the 5-year meteorological data period. These emission scenarios are conservative relative to the likely operation of the combustion turbines.

Electronic data associated with the DEP's revised surface characteristics "sensitivity analysis" Class II area model runs for PM-2.5 are available upon request.

Also see response to Comment 12.

[2] Qian, W., and A. Venkatram, 2011. Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions. Boundary Layer Meteorology, 138, 475-491.

6. **Comment (Comment 3 from CAC and EIP on July 31, 2020):** Without Air Modeling Files for Class II Areas, the Public Cannot Fully Evaluate Issues Relating to the Applicant's Air Modeling -- Including the Consideration of Sulfuric Acid Mist. (45 – 49)

   Response: All electronic data files submitted to the DEP by Robinson Power for its August 2019 air dispersion modeling were transmitted to the commentators on August 3, 2020, via an internet-based file sharing service.

   The federal Prevention of Significant Deterioration (PSD) regulations, codified in 40 CFR § 52.21, do not require Robinson Power to conduct pre-construction ambient air monitoring for sulfuric acid mist (H_2SO_4) or to determine the ambient impacts due to its H_2SO_4 emissions with air dispersion modeling. The federal PSD regulations are adopted and incorporated by reference in their entirety in 25 *Pa. Code* § 127.83 and the Commonwealth's State Implementation Plan (SIP) codified in 40 CFR § 52.2020.

   Also see response to Comment 12.

7. **Comment (Comment 4 from CAC and EIP on July 31, 2020):** The Department Should Incorporate Stack Height Requirements into the Proposed Plan Approval. (45 – 49)

   Response: The facility must be constructed in accordance with the information provided in the plan approval application, including design parameters such as stack height. The proposed turbine stack heights meet Good Engineering Practice (GEP). Any changes to the site layout, including stack height, exhaust parameters, etc. during construction of the facility may require revised modeling to be reviewed by the Department to assess any potential changes to the ambient impact.

All Others

8. **Comment:** Request to extend the public comment period. (1 – 49)

   Response: Several comments were received from the public requesting an extension of the public comment period of the proposed plan approval. The notice of intent to issue the plan approval was sent to the applicant on May 20, 2020, and the applicant published the notice in the *Observer-Reporter* on May 23, 24, and 26, 2020, within 10 days of receipt of the notice, in accordance with 25 Pa. Code § 127.44(c). Proof of publication was provided by the applicant on June 8, 2020. Notice of intent to issue the plan approval was published in the *Pennsylvania Bulletin* on May 30, 2020, beginning the 30-day public comment period, in accordance with 25 Pa. Code § 127.44(c). On June 2, 2020, the Department sent the notice of intent to issue the plan approval to the United States Environmental Protection Agency (EPA) beginning the 45-day comment period until July 17, 2020. The comment period was not formally extended, but all comments received prior to the final decision on the plan approval decision have been considered.

9. **Comment:** Request to hold a public hearing. (1, 2, 45 – 49)

Response: In accordance with 25 Pa. Code § 127.48 (a), "Prior to any plan approval issuance, the Department may, in its discretion, hold a fact finding conference or hearing at which the petitioner, and any person who has properly filed a protest under § 127.46 (relating to filing protests) may appear and give testimony; provided, however, that in no event will the Department be required to hold such a conference or hearing."

The applicant has demonstrated that emissions from the proposed changes and additional equipment will be minimized through the use of appropriate best available technology (BAT), Best Available Control Technology (BACT), and Lowest Achievable Emission Rate (LAER). The applicant has also demonstrated that the proposed facility will not cause or contribute to air pollution in violation of the National Ambient Air Quality NAAQS, will not impair visibility, soils, and vegetation, and will not adversely affect AQRV, including visibility, in federal Class I areas.

Details regarding the aspects of the project and project emissions were published in the *Observer-Reporter* on May 23, 24, and 26, 2020, and in the *Pennsylvania Bulletin* on May 30, 2020, to notify the public of the proposed project. In order to provide additional information about the project to the public, the draft plan approval, review memo, and Air Quality modeling analysis were added to the Department's website on June 2, 2020, at:

https://www.dep.pa.gov/About/Regional/SouthwestRegion/Community%20Information/Pages/Robinson-Power.aspx.

The link to the Department's website where the documents are available was provided to those who had requested the additional information on the project. Based on the above information, the Department has determined not to hold a public hearing for this project.

10. **Comment:** The Department should require a more complete analysis of additional impacts as a result of growth associated with the facility. (45 – 49, 52 – 94)

Response: The growth analysis considers the associated industrial, commercial, and residential source growth in the area and the air emissions generated as a result of this industrial, commercial, and residential source growth associated with the project.

Associated growth is growth that comes about as the result of the construction or modification of a source but is not a part of that source. It does not include the growth projections addressed by 40 CFR § 51.166(n)(3)(ii) and 40 CFR § 52.21(n)(2)(ii), which have been called nonassociated growth. Emissions attributable to associated growth are classified as *secondary emissions*. Per 40 CFR § 52.21 (b)(4) under the definition of potential to emit, "…Secondary emissions do not count in determining the potential to emit of a stationary source."

Information regarding growth was provided in the March 2016 submittal by the applicant, which was subsequently amended in March 2017 under Section 8.9 of the submittal. At the request of the Department, the following information was provided on November 20, 2020:

> "An analysis of growth resulting from the construction and operation of the Facility was performed for the PSD application submitted in 2016 for the 2x1 combined cycle facility. The modifications permitted under the Plan Approval submitted on February 4, 2019 do not include significant modifications to the construction that was planned for the 2016 PSD application. Therefore, the estimate of workers required for construction and operation should not differ from what was described in the 2016 application.
>
> Additionally, the application submitted in 2016 stated that commercial, residential, or industrial growth due to regional growth attributed to the Project was projected to be negligible. The Facility will only require approximately 20 workers for the operation of the project, and ample skilled workers are available from the local workforce to staff the Facility. Because the Project is a natural gas-fired power plant, growth of industries providing goods and services, maintenance facilities or other large industries necessary for the operation of the Project is not expected to occur. The gas will be provided to the facility via pipeline and the only other operational requirements will be performed by the personnel employed by the Facility (approximately 20 workers). The natural gas supply in the region is ample and no new gas wells are expected to be drilled specifically to supply the Facility. Emissions from the dew point heaters that will be constructed to heat gas coming into the Facility were included in the Plan Approval Application. The commenters state that future emissions from local gas processing plants should be included in this analysis. If future emissions from these gas processing facilities occur, they will be permitted for the sources which emit them and not for this Project. Therefore, any additional emissions from residential, commercial, and industrial growth due to the Project are considered negligible."

Considering the above information and the response to Comment 1, the Department finds this portion of the Additional Impact Analyses provided by the applicant required under 40 CFR § 52.21(o)(2) to be acceptable.

Also see response to Comment 1.

11. **Comment:** The facility will pollute our air, land and water which can negatively impact our health and safety. (1)

Response: The Department has evaluated the air contamination aspects of this proposed facility in accordance with the applicable regulations derived from the U.S. Clean Air Act and the Pennsylvania Air Pollution Control Act. The Clean Air Act required EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment and establishes two levels of national ambient air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Per 40 CFR § 81.339, Robinson Township, Washington County is classified as attainment or attainment/unclassifiable for all National Ambient Air Quality Standards (NAAQS). The entire Commonwealth of Pennsylvania is considered a "moderate" ozone nonattainment area for NOx and

VOCs because Pennsylvania is a jurisdiction in the Ozone Transport Region established by operation of law under Section 184 of the Clean Air Act.

After review, the Department determined that Robinson Power's source impact analyses demonstrate that the Beech Hollow Facility's emissions would not cause or contribute to air pollution in violation of the NAAQS.

The project's plan approval appropriately considers environmental impacts, which will be controlled in accordance with the constitution, the statute and regulations which are applicable to this project. The project will exceed minimum regulatory requirements and will not jeopardize human health and safety.

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12. **Comment (Comment 3 from CAC and EIP on July 17, 2020):** The Department Should Require a More Complete Analysis of Best Available Control Technology (BACT) and Lowest Achievable Emissions Rate (LAER). (45 – 49; additional similar comments from 52 – 94)

Response: At the request of the Department, on June 28, 2019, the applicant submitted a LAER analysis for NOx emissions as well as a revised BACT and BAT analysis for the proposed General Electric 7HA.02 natural gas-fired combustion turbines as well as the other sources at the proposed facility. At the request of the Department, additional information was submitted by the applicant on March 12, 2021.

The applicant has conducted the BACT review following a 5 step "top down" analysis which has been recommended by EPA for attainment pollutants as well as GHGs.

1. Identify all available control technologies
2. Eliminate technically infeasible options
3. Rank remaining control technologies by effectiveness
4. Evaluate the most effective controls and document results
5. Select BACT

The applicant conducted the LAER analysis for NOx using the following three steps[3]:

1. Identification of available control technologies
2. Evaluate technical feasibility of identified technologies and identification of most stringent existing permit limits
3. Propose LAER based on the feasible technology and the most stringent emissions limit that has been *achieved in practice*.

The following addresses the specific pollutants and facilities identified by the commenter.

Carbon Monoxide (CO)

[3] An important differentiation between BACT and LAER is that LAER does not consider cost.

Robinson has proposed to control CO through the use of good combustion practices/burner design and oxidation catalyst. Based on the provided manufacturer's information along with review of the RBLC and BAT for other recently issued plan approvals for similar sources, the Department has determined the appropriate CO emission rate is 2.0 ppmvd @ 15% O_2 on a 1-hour averaging period. This is consistent with BACT determinations for all GE 7HA.02 turbines identified in the RBLC.

The commenter has identified other facilities with CO emission limits less than 2.0 ppmvd, specifically Kleen Energy Systems, LLC with a limit of 0.9 ppm and Brunswick Power Station with a limit of 1.5 ppm. Although the above facilities have lower CO emissions limits for their combustion turbines, the units at those facilities are of different make and model than the units proposed at Robinson. Proper evaluation of turbine emissions of CO involves a myriad of factors in addition to emission rates including operational requirements and efficiency.

The Kleen Energy Systems, LLC utilizes Siemens SGT6-PAC 5000F turbines and the Brunswick Power utilizes Mitsubishi M501GAC G-class turbines, of which the operational and design parameters differ significantly from that of the GE 7HA.02. For example, the GE 7HA.02 has a pressure ratio of 23:1 versus 20:1 for the Mitsubishi M501GAC. Additionally, the 7HA.02 fact sheet (GEA31684, October 2015) specifies a net 2x1 combined cycle output of 1,005 megawatts (MW) @ 25 ppm NOX and a net heat rate of 5,510 Btu/kWh for two GE 7HA.02 units versus 856 MW @ 15 ppm NOX (MHPS Gas Turbine Catalog M501G/M701G) and a net 2x1 combined cycle heat rate of 5,725-5,735 Btu/kWh for two Mitsubishi M501GAC units (Power Engineering International - Gas & Steam Turbine Directory, April 2014). According to Robinson, the GE 7HA.02 is also designed to operate at loads as low as 30%, where Brunswick is capable of operating at loads of 50% and above; illustrating differences between the units.

Comparing Robinson to the Dominion Warren County Power Plant which utilizes Mitsubishi M501GAC turbines; although Warren has a limit of 1.5 ppm CO, the CO mass emissions are 17.4 lb/hr compared to 15.5 lb/hr at Robinson. Although the exhaust CO ppm values are similar, the greater efficiency (lower heat rate) and lower turndown capability (as low as 30% load) of Robinson's turbines results in a lower emitting process.

It is the Department's position that the proposed GE 7HA.02 turbines cannot be considered as the "same class" as the turbines referenced by commentators and therefore it is not appropriate to establish the same emissions limit for these units. The Department concludes that CO BACT for the proposed GE 7HA.02 combustion turbines is oxidation catalyst and good combustion practices at an exhaust concentration of 2.0 ppm CO @ 15% O_2.

Volatile Organic Compounds (VOC)

Robinson has proposed to control VOC through the use of good combustion practices/burner design and oxidation catalyst. Based on the provided manufacturer's information along with review of the RBLC and BAT for other recently issued plan approvals for similar sources, the Department has determined the appropriate VOC emission rate is 1.0 ppmvd @ 15% O_2 based on initial and subsequent EPA Reference stack testing. This is consistent with BACT determinations for all GE 7HA.02 turbines identified in the

RBLC. Note that the facility-wide PTE for VOC is less than 50 tpy; therefore, VOC emissions are not subject to LAER.

The commenter has identified other facilities with VOC emission limits less than 1.0 ppmvd, specifically the Chouteau Power Plant. Similar to the response regarding CO, the Chouteau Power Plant utilizes a Siemens V84.3A combustion turbine which has operational and design parameters that differ significantly from the GE 7HA.02 units proposed by Robinson. It is the Department's position that the proposed GE 7HA.02 turbines cannot be considered as the "same class" and therefore it is not appropriate to establish the same emissions limit for these units.

Particulate Matter

BACT for control of PM, PM_{10}, and $PM_{2.5}$ has been determined to be combustion of a low sulfur fuel. Good combustion practices, and proper operation and maintenance will also be required. Due to the inherently low total PM emissions rates associated with low-ash and low-sulfur fuels in combustion turbines, add-on filtration or collection devices would exhibit very low control efficiencies, and as a result, high cost to control efficiency ratio. Also, a review of the RBLC showed no natural gas-fired combined cycle units equipped with add-on controls.

According to the applicant's March 12, 2021, response, "…Particulate matter emissions depend on many things: gas composition, existing ambient concentrations (pulled in from the air inlet) and the formation of ammonium sulfate ([NH4]2SO4) in the SCR and oxidation catalyst systems. The amount of ammonium sulfate produced in the control systems is widely unknown and unpredictable under all ambient operating conditions. As such it is assumed that all sulfur in the fuel reacts with the ammonia and creates ammonium sulfate. These particulate emissions are included in the overall particulate emissions that will be measurement [measured] in the stack. The particulate emissions are not controllable, and thus the emissions are what they are, assuming vendor data for the combustion turbine and the formation of ammonium sulfate in the SCR/oxidation catalyst. The particulate emissions, as seen in the RBLC table, vary, depending on many different variables. Also note that while there are several entries for the same type of combustion turbines in the RBLC, note that the PM emission limits vary significantly for those as well: from 43 lb/hr to 18 lb/hr for PM10. The limits proposed in the Robinson Power permit are reflective of the emissions expected due to the additional particulate formed in the air pollution control devices and are considered BACT…"

It is difficult to make comparisons of numerical emissions limits included in the RBLC with respect to $PM/PM_{10}/PM_{2.5}$ emissions for several reasons. First, some of the queried results represent emissions limits based on only the filterable portion of total $PM/PM_{10}/PM_{2.5}$ emissions. If the condensable portion, including sulfates generated during the combustion process, is not included, a lower emissions limits will result. Secondly, the emissions limits that do contain both the filterable and condensable portion are based on widely varying natural gas sulfur contents. Sulfur in the fuel is converted to sulfates during the combustion process, and these sulfates add to the condensable portion of the total $PM/PM_{10}/PM_{2.5}$ emissions. The sulfur content is based on the natural gas available in the region. The proposed sulfur content limit is consistent with other recent plan approvals and the particulate matter emissions proposed have been determined to be acceptable.

Sulfuric Acid Mist (H_2SO_4) and Sulfur Dioxide (SO_2)

BACT for control of H_2SO_4 and BAT for control of SO_2 has been determined to be combustion of a low sulfur fuel. Good combustion practices, and proper operation and maintenance will also be required. Uncontrolled H_2SO_4 and SO_2 emissions both depend on the sulfur content of the fuel. H_2SO_4 emissions also depend on the oxidation of SO_2 to SO_3, followed by the subsequent conversion of SO_3 to H_2SO_4 when water vapor is present. H_2SO_4 emissions are not necessarily dependent upon combustion turbine properties such as burner design. Vendors cannot guarantee the amount of sulfur that will be converted to H_2SO_4 through the turbine, SCR, and oxidation catalyst. As such, the applicant has conservatively assumed that all sulfur may be converted to H_2SO_4 through the system. The increase in the emission limit reflected in this plan approval is largely due to the calculation methodology rather than a change in technology or operation that would result in increased actual emissions. Actual emissions of H_2SO_4 and SO_2 will be verified by initial source testing and subsequent testing at a minimum of once every five years. Furthermore, sulfur content of the gas will be monitored by quarterly grab sample data to ensure the natural gas received at the facility does not exceed 0.4 grains per 100 dscf to demonstrate continued compliance.

No applications have been identified of FGD scrubbers or dry sorbent injection on natural gas-fired combustion turbines due to low SO_2 and H_2SO_4 emissions. Due to the low concentration of H_2SO_4 in the exhaust gas, neither the FGD scrubber nor dry sorbent injection would provide measurable emission reduction. Application of FGD to the turbine exhaust would also cause significant pressure drop in the exhaust ducting and would require the addition of a fan which would result in additional parasitic plant load and potential air/fuel mixing problems. Based on the insufficient operating history of these control technologies on similar units, these methods are considered technically infeasible. This is consistent with determinations listed in the RBLC and other recent plan approvals.

More stringent limits have been identified in the RBLC, however since no add-on controls are considered feasible, the H_2SO_4 and SO_2 emissions are based on the sulfur content of the natural gas to be combusted. The proposed sulfur content limit is consistent with other recent plan approvals and has been determined to be acceptable. The Department isn't aware of any facilities that incorporate fuel sulfur removal or reduction on fuel gas supplies to achieve more stringent limits at other facilities with similar fuel sulfur content. Permit limitations which apply to a pollutant of which the emission rate varies according to the fuel sulfur content should allow for expected fluctuations thereof. The proposed emission rates account for such fluctuations.

Ammonia Slip

Ammonia will be used as a reagent in the SCR for NOx control. Ammonia slip is the ammonia that doesn't react in the SCR and exhausts into the atmosphere. The higher the NOx control efficiency usually requires greater amounts of ammonia, which results in higher levels of ammonia slip. Ammonia to NOx molar ratios greater than one-to-one are necessary to achieve high NOx removal efficiencies due to imperfect mixing and other reaction limitations. BAT has been determined to be good combustion practices such that the exhaust gas temperature stays within the designed temperature range of the SCR and injecting the proper amount of ammonia. Robinson has proposed an ammonia slip emission limit of

5.0 ppmvd at 15% O_2. The proposed emission limit is consistent with similar sources found in the RBLC and will be verified by CEMS.

Also, see response to Comment 2D and 16.

13. **Comment (Comment 4 from CAC and EIP on July 17, 2020):** The Department Should Set Clear and Enforceable Definitions, Limits, and Monitoring for the Turbines' Startup and Shutdown. (45 – 49; additional similar comments received from 51 – 94)

Response: The commenter has suggested that the proposed "…definitions are unenforceable and set incentives against prompt compliance with the emission limits Under the modified startup definition, startup doesn't end until "the time emissions compliance is achieved." This means that a period of startup is effectively unlimited. If the turbines fail to meet the emission limits, even as they begin normal operations, Robinson Power can claim under the modified definition that they are still in startup. Under the modified definition, there is no reason for Robinson Power to quickly bring the facility into normal operations and compliance…"

After discussion with the applicant, the following revised definition for Startup has been requested in the March 12, 2021, response: ~~Beginning upon combustion of fuel within the combustion chamber and ending when the SCR catalyst bed reaches its design operating temperature~~. Startup, as it relates to the combustion turbines, is defined as the period of time from initiation of combustion firing until the unit reaches a minimum emission compliance load (30% load) and the SCR has reached its required operating temperature.

The applicant has requested the following revised definition for Shutdown in the March 12, 2021, response: ~~Beginning when the SCR catalyst bed drops below its design operating temperature and ending when fuel is no longer being combusted~~. Shutdown, as it relates to the combustion turbines, is defined as the period of time from which the turbine output is lowered with the intent to shut down, beginning at the point at which the load drops below the minimum emission compliance load (30% load).

The definitions of startup and shutdown were requested to be changed to be defined in a way that is recommended by the combustion turbine vendor and that is easily tracked by CEMs. Startup should include operations up until the turbine is in emissions compliance, which may or may not directly correlate to a specific catalyst temperature.

There is no incentive for Robinson to remain in startup or shutdown for business purposes. Furthermore, the plan approval limits the duration of startups and shutdowns as follows under Section E. Combustion Turbines Condition #011:

a. Cold start is defined as a restart occurring 72 or more hours after a shutdown. *Cold start period shall not exceed 55 minutes per occurrence*.
b. Warm start is defined as a restart occurring between 8 hours and 72 hours after a shutdown. *Warm start period shall not exceed 40 minutes per occurrence*.

c. Hot start is defined as a restart occurring less than 8 hours after a shutdown. *Hot start period shall not exceed 20 minutes per occurrence*.
d. Duration of each startup and shutdown shall be minimized to the extent possible consistent with manufacturer's procedures.
e. Duration of all startups and shutdowns combined shall not exceed *147 hours in any consecutive 12-month period*.

Emissions of NOx and CO are monitored by the CEMs at all times, including during startup and shutdown. This plan approval requires monitoring of VOC emissions through correlation with CO CEMS. The applicant has contested that due to the expected low concentration of CO emissions, correlation with VOC may not be plausible and has been requested it to be removed. The correlation requirement will remain unchanged at this time until site-specific data is available to support the request.

Startup and shutdown emissions are included in the facility-wide annual limits. Based on the above requirements, the Department disagrees that the definitions are unenforceable, cyclical, and allow for prolonged durations of startup and shutdown events as they are limited to specific timeframes and parameters.

Furthermore, as suggested by examples provided by EPA for other similar facilities, the plan approval will include emission limitations on a per startup/shutdown event basis for each turbine. This condition will be added to the plan approval as follows:

> During each startup or shutdown event, emissions from each turbine shall not exceed the following:

Startup/Shutdown Event	Pollutant Limitations lb/turbine	
	NOx	**CO**
Cold Start Event	260	770
Warm Start Event	146	150
Hot Start Event	70	120
Shutdown Event	8	125

Also see response to Comment 19.

14. **Comment (Comment 5 from CAC and EIP on July 17, 2020):** The Department Should Reassess the Facility's Potential to Emit and Require Supplemental Information from Applicant to Support Emission Guarantees, Control Technology Performance and Hazardous Air Pollutant Potential to Emit Calculations. (45 – 49; additional similar comments received from 52 – 94)

A. **Comment:** The Department Must Require Supplemental Information Regarding Manufacturer Guarantees for Turbine Emission Rates and Oxidation Catalyst Performance.

Response: Based on information from control device manufacturer's, GE has provided guaranteed emission rates from the combustion turbines based on the design parameters. Section E Conditions

#005, 006, 007 require the applicant to monitor temperature and pressure differential across the SCR and oxidation catalysts to ensure proper operation. The continuous monitoring of the operational parameters can be compared with the parameters measured during compliant stack testing for assurance of proper operation and performance. Furthermore, emissions of NOx and CO will be monitored at all times by the CEMS to demonstrate compliance with the emission limits.

B. **Comment:** The Department should Assess whether the Facility is a Major Source of Hazardous Air Pollutants (HAPs), Specifically for Formaldehyde.

Response: The CAA defines a "major source" to mean "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants."

The potential to emit from the facility is 16.03 tpy of total HAPs and 6.18 tpy of formaldehyde (the highest single HAP from the facility). The next highest single HAP is toluene at 4 tpy. The majority of the HAPs emissions from the facility are from the combustion turbines. According to Section 3.1.3.5 of EPA AP-42 Chapter 3.1 – Stationary Gas Turbines (April 2000), "Available data indicate that emission levels of HAP are lower for gas turbines than for other combustion sources. This is due to the high combustion temperatures reached during normal operation. The emission data also indicate that formaldehyde is the most significant HAP emitted from combustion turbines. For natural gas fired turbines [presumed without post-combustion HAPs controls], formaldehyde accounts for about two-thirds of the total HAP emissions. Polycyclic aromatic hydrocarbons (PAH), benzene, toluene, xylenes, and others account for the remaining one-third of HAP emissions." However, the notice of final rulemaking for 40 CFR Part 63 Subpart YYYY– National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines (Federal Register, March 5, 2004) states that "although numerous HAP may be emitted from combustion turbines, only a few account for essentially all the mass of HAP emissions from stationary combustion turbines" which include "formaldehyde, toluene, benzene, and acetaldehyde." The notice further states that "natural gas fired stationary combustion turbines do not emit metallic HAP."

Section 3.1.4.3 states that "Carbon monoxide oxidation catalysts are typically used on turbines to achieve control of CO emissions…CO catalysts are also being used to reduce VOC and organic HAPs emissions." The formation of carbon monoxide during the combustion process is also a good indicator of the expected levels of HAP emissions. In the notice of final rulemaking for 40 CFR Part 63 Subpart YYYY, EPA stated that "formaldehyde is an appropriate surrogate for the other organic HAP which are also controlled by an oxidation catalyst." Although the proposed units are not subject to Subpart YYYY since the facility is not considered major for HAPs, formaldehyde emissions will be limited to 91 ppbvd @ 15% O_2 as require by Subpart YYYY. Compliance with the formaldehyde limit will be demonstrated by stack testing. Potential to emit of other HAPs has conservatively been calculated using emission factors from AP-42 and don't account for control by the oxidation catalyst. The conservative emission estimates demonstrate the facility will not be a major source of HAP.

15. **Comment (Comment 6 from CAC and EIP on July 17, 2020):** The Department Should Reevaluate the High Sulfuric Acid Mist Emissions Limitation in the Proposed Permit, Which Apparently is Based on Erroneous Assumptions Regarding Formation of this Pollutant. (45 – 49)

    Response: See response to Comment 12.

    Group Against Smog and Pollution

16. **Comment:** The Project's NOx emissions do not comply with the Clean Air Act's "Lowest Achievable Emission Rate" Requirement. (50)

    Response: In accordance with 25 Pa. Code § 121.1, LAER – *Lowest Achievable Emission Rate* is defined as:

    "(i) The rate of emissions based on the following, whichever is more stringent:
    (A) The most stringent emission limitation which is contained in the implementation plan of a state for the class or category of source unless the owner or operator of the proposed source demonstrates that the limitations are not achievable.
    (B) The most stringent emission limitation which is achieved in practice by the class or category of source.
    (ii) The application of the term may not allow a new or proposed modified source to emit a pollutant in excess of the amount allowable under an applicable new source standard of performance."

    The commentator has suggested that LAER for this facility is 190.44 tpy of NOx based on the facility-wide limit included in the original authorization on October 27, 2017, rather than the newly proposed facility-wide limit of 231.70 tpy. The primary reason for increased facility-wide NOx emissions is the proposal to install two (2) 3,485.8 MMBtu/hr GE 7HA.02 natural gas-fired combustion turbines rather than two (2) 3,051 MMBtu/hr Siemens SGT6-8000H units and increase the total startup/shutdown hours for the combustion turbines based on projected market demands. After review, LAER for NOx from the combustion turbines has been determined to remain 2.0 ppmvd @ 15% O_2 on a 1-hour average, excluding startup and shutdown. The proposed rate will be accomplished by the installation and operation of dry-low-NOx (DLN) burners and selective catalytic reduction (SCR). Good combustion practices, proper operation and maintenance, and minimization of the duration of each startup and shutdown event will also be required.

    As part of this authorization, the applicant has also proposed an increase in the size of the auxiliary boiler from 30 to 91.1 MMBtu/hr and increase the hours of operation, and add two (2) dew point heaters to support the facility (3.34 and 9.69 MMBtu/hr).

    The proposed changes result in higher potential facility-wide NOx emissions, but it has been determined that each individual source satisfies LAER for NOx. This plan approval has been reviewed as a new project since there are no existing emissions as the facility has not yet been constructed. After review of the requirements for a new major facility, it has been determined the applicant meets the applicable requirements of NNSR (including LAER and obtaining the appropriate emission offsets) and PSD

(including BACT and modeling) to demonstrate compliance with the applicable requirements for a major facility.

17. **Comment:** The Project's emissions do not comply with the Clean Air Act's "Best Available Control Technology" Requirement. (50)

    Response: Pennsylvania has adopted the federal Prevention of Significant Deterioration (PSD) regulations for major projects in attainment (or unclassifiable) areas. This authorization is subject to PSD requirements for emissions of nitrogen dioxide (NO_2), carbon monoxide (CO), filterable particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfuric acid mist (H_2SO_4) and greenhouse gas (GHG) carbon dioxide equivalents (CO_2e). PSD requirements have been applied to this project which include Best Available Control Technology (BACT) for each attainment pollutant and conducting an air quality modeling analysis. The Department has evaluated this plan approval as a new project and has determined the proposed control technology and emission rates are consistent with BACT for all criteria pollutants from each source. This plan approval does not result in an increase of actual emissions since the facility has not yet been constructed.

    Also see response to Comment 12.

18. **Comment:** The Project's emissions do not comply with Pennsylvania's "Best Available Technology" Requirement. (50)

    Response: In accordance with 25 Pa. Code § 121.1, *Best Available Technology* is defined as "Equipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available." BAT is not an emission limit. The equipment, devices, methods or techniques proposed in this plan approval are consistent with BAT to control emissions of air contaminants to the maximum degree possible.

    Also see response to Comment 12.

U.S. Environmental Protection Agency

19. **Comment:** Startup/Shutdown Limits: Best Available Control Technology (BACT) and Lowest Achievable Emission Rate (LAER) limits must apply at all times, during normal operation as well as during the various startup/shutdown modes. Section E of the draft plan approval, source group restrictions for the two combustion turbines (beginning on page 37), contains short-term emission limits that apply during normal operation only (see Condition #002) and annual emission limits that apply at all times (see Condition #003). Condition #011 contains restrictions for hot, warm and cold starts, expressed as "x minutes per occurrence," but no explicit short-term limitation on emissions during this time. Condition #011 also contains an overall duration limit for combined startups/shutdowns of "not to exceed 147 hours in any consecutive 12-month period." (51)

Response: As suggested by the examples provided by the EPA (Enclosure 1: Virginia Electric and Power Company Greensville Power Station beginning on page 15 and Enclosure 2: APV Renaissance Partners Opco, LLC beginning on page 56) the following condition has been developed to address the requested BACT/LAER emission limitations for NOx and CO on a per Startup/Shutdown Event basis for each turbine. This condition will be added to the plan approval as follows as indicated in response to Comment 13:

> During each startup or shutdown event, emissions from each turbine shall not exceed the following:

Startup/Shutdown Event	Pollutant Limitations lb/turbine	
	NOx	**CO**
Cold Start Event	260	770
Warm Start Event	146	150
Hot Start Event	70	120
Shutdown Event	8	125

20. **Comment:** Sulfuric Acid (H_2SO_4): (51)

a. Comment: A BACT determination is provided for H_2SO_4 emissions at the facility. Please bolster the technical review memo to discuss the significance of H_2SO_4, why it is being controlled, and what the major sources of H_2SO_4 emissions are at the facility. Please also ensure that this BACT determination and the associated limits (including the PTE limit) have been updated for this most recent plan approval action (vs. previous plan approval actions- i.e., the facility is no longer pursuing waste coal).

Response: BACT for control of H_2SO_4 has been determined to be combustion of a low sulfur fuel. Good combustion practices, and proper operation and maintenance will also be required. H_2SO_4 emissions depend on the sulfur content of the fuel. H_2SO_4 emissions also depend on the oxidation of SO_2 to SO_3, followed by the subsequent conversion of SO_3 to H_2SO_4 when water vapor is present. It has been determined there is no appropriate method to control H_2SO_4 emissions.

The primary source of H_2SO_4 is from the combustion turbines at a rate of 53.12 tpy combined. The facility-wide total is 53.14 tpy including the auxiliary boiler, fire pump engine, and dew point heaters. The final plan approval will reflect these values for the proposed natural gas-fired combined cycle plant.

Also see response to Comment 12.

b. Comment: On page 38, Condition #003, the draft plan approval lists the annual limit for H_2SO_4 for the two turbines as 53.14 tpy, however, this appears to be the overall facility PTE, according to the technical review memo. The review memo states the PTE limit as 53.12 tpy for the two turbines. Please correct the discrepancy.

Response: Section E, Group – Combustion Turbines, Condition #003 will be corrected to 53.12 tpy.

21. **Comment:** References to Duct Burners: On page 6 of the technical review memo, there is a reference to duct burners for the two combustion turbines in the discussion of the BACT determination for GHGs. Page 3 of the review memo states that Plan Approval D (original), issued in October 2017, included the removal of the natural gas-fired duct burners. Please clarify the language on page 6, removing reference of duct burners. (51)

    Response: The Department agrees that page 6 of the review memo erroneously references duct burners in relation to the CO_2/MWh emission limit from the turbines. The original plan approval, PA-63-00922D issued October 27, 2017, included duct burners; however, on October 4, 2018, the plan approval was modified to remove duct burners from the project. The current proposal does not include duct burners and the final plan approval will not authorize the construction and/or operation of duct burners.

22. **Comment:** Formaldehyde (HCHO): (51)

    a. Comment: Table 1 on page 7 of the technical review memo indicates that there was a LAER/BACT/BAT determination for HCHO, however, there is no discussion of HCHO in earlier sections of the review memo. HCHO does not seem to require a PSD/NSR analysis. Therefore, is this a BAT determination, as the title of Table 1 implies, or is this a PTE limit being taken by the facility? Please bolster the review memo to discuss HCHO, its significance at the facility, and how the HCHO limits were determined.

    Response: HCHO is not subject to the requirements of PSD or NNSR but is subject to BAT. BAT for control of HCHO has been determined to be installation and operation of oxidation catalysts, good combustion practices, and proper operation and maintenance. The appropriate short term HCHO emission limit from the combustion turbines was determined to be 91 ppbvd @ 15% O_2, derived from 40 CFR Part 63 Subpart YYYY– National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. Although the proposed units are not subject to Subpart YYYY since the facility is not major for HAPs, the proposed limit is consistent with other recent plan approvals for combustion turbines at area sources. Demonstration of compliance with the HCHO limit is stack testing of the combustion turbines within 180 days of startup and subsequent testing at a minimum of once every 5 years thereafter.

    Also see response to Comment 14B.

    b. Comment: Similarly, Table 2 on page 15 of the review memo lists HAP emissions at 16.03 tpy. Please bolster the review memo to include a discussion of individual HAP emissions at the facility and whether any of those individual HAP emissions are close to the 10 tpy threshold.

    Response: The potential to emit from the facility is 16.03 tpy of total HAPs and 6.18 tpy of formaldehyde (the highest single HAP from the facility). The next highest HAP is toluene at 4 tpy based conservatively on AP-42 factors. The plan approval includes a requirement that emissions from all sources shall not exceed 6.18 tons of HCHO and 16.03 tons of total HAPs on a 12-month rolling sum basis.

Also see response to Comment 14B.