

From: [Collins, Catherine](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [Allen, Tim](#)
Subject: Alaska LNG
Date: Friday, September 18, 2020 3:04:57 PM

Hi Dave,

Thanks for keeping us in the loop. Tim did tell me about what you talked about today and we will work to have a discussion by Tuesday about the LNG facility as part of the FWS Federal Land Manager Review. We have worked to piece all of the information together and typically we get a FLM FLAG package prior to the permit; however if you have this information all together in one place we can validate what have (permit limits, emissions, modeling inputs etc.

Please let me know if you have further questions.

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: [Collins, Catherine](#)
To: [Jones, Dave F \(DEC\)](#)
Subject: Alaska LNG
Date: Tuesday, September 22, 2020 7:33:51 AM

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,
Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: [Collins, Catherine](#)
To: [Jones, Dave F \(DEC\)](#)
Subject: Alaska LNG
Date: Tuesday, November 3, 2020 12:39:58 PM

Thank you for providing the data and permit information regarding the Alaska LNG facility located in Kenai Alaska. The Tuxedni National Wildlife Refuge is a Class I area, as defined by the Clean Air Act, that is located 86 km from the proposed project. For this project, procedures regarding Federal Land Manger (FLM) notification and consultation were not completely followed. In the future, the United States Fish and Wildlife Service (FWS) would like to be provided the opportunity to review draft Prevention of Signification Deterioration (PSD) permit actions that potentially may impact Class I areas prior to the public comment period. As is provided in 40 CFR 52.21(p) the FLM is afforded the opportunity to be notified and consulted with regarding the review PSD permit actions that may impact Class I areas managed by the FWS. The required elements include a notice to the Federal Land Mangers at least 60 days prior to any public hearing or comment, and shall include an analysis of the proposed source's anticipated visibility impacts in the Federal Class I area and shall make available materials used to make the determination. FWS considers the necessary information to evaluate a permit action to be the permit application, Air Quality Related Value (AQRV) modeling protocol/analysis (that follows the Federal Land Managers' Air Quality Related Values Workgroup (FLAG 2010) Guidance, Best Available Control Technology (BACT) analysis, state analysis, and draft preliminary permit.

In the future as a part of the PSD permit development process, we suggest that the State of Alaska contact us early in the process to discuss the appropriate modeling protocol/analysis. We have found that these types of discussions speed along the permit and review processes.

FWS has reviewed the Alaska LNG facility emissions, BACT, air quality modeling analysis and draft permit. At this time, we will not require any additional AQRV analysis. For the normal operation of the facility, the potential impacts to the Tuxedni National Wildlife Refuge (NWR) are below the visibility and deposition thresholds outlined in FLAG.

When assessing the potential impact to Class I area, the FLM evaluates the 24-hour maximum emissions, such as when the facility is operating under the maximum flaring scenario. In the evaluation of the 24-hour short term operating scenario, there may be some situations where flaring and meteorological conditions could potentially impact Tuxedni NWR. Additionally, there may be ancillary emissions due to the facility that could potentially impact Tuxedni NWR. We would like to encourage the State of Alaska to consider options to better control the emissions from the flares, especially during the maximum operating scenario or consider short-term flare operational limits in the permit. Additionally, the State should consider including tons per year, and short-term emissions limits (i.e. 24 hour or 30 day or rolling averages) for the criteria pollutants. We request that the state reexamine the maximum allowed emissions limits and the annual emission limits in the permit. Currently, if the facility operates at the maximum allowed in the permit the annual emissions would be exceeded. Should any of the emissions, emission controls, or project parameters change significantly, please contact us so that we may re-evaluate the project.

Thank you for informing FWS and please let me know if you have further questions.

-- Catherine Collins and Tim Allen

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [Paul Burger](#); [Blakesley, Andrea J](#); [Shepherd, Don](#); [King, Kirsten L](#); [Collins, Catherine](#); [Peters, Melanie](#)
Subject: NOx BACT questions for ADEC
Date: Monday, October 26, 2020 8:24:28 PM
Attachments: [ARD_AKLNG_LNG-LF_BACT_spreadsheets.zip](#)
[LF_ARD_analysis_assumptions_review_notes_10-26-20.docx](#)

Hi Dave,

Thank you for sending the pre-draft permit materials for the Agrium facility restart permit. We appreciate the communication regarding current permitting actions in Alaska, including the Agrium permit, as well as the AK LNG liquefaction facility permit. Because the AK LNG liquefaction facility (LF) is located adjacent to the Agrium plant, we are providing the attached documents to continue our dialog.

Our review of both permits is ongoing and we are preparing our responses, but to date, we have evaluated the technical accuracy of the BACT analyses and conclusions and have noted a significant ^[1] discrepancy in the NOx BACT determinations for these sources. Considering the proximity and similarity of the emission units at these sources, why has ADEC concluded that SCR is economically feasible for the turbines at Agrium, but not at the AK LNG facility?

I am sharing our initial technical evaluation of the AK LNG NOx BACT analysis to aid in the discussion of this topic. We previously provided a technical evaluation of the Agrium BACT determination. While we agree with the determination that SCR is BACT, we continue to recommend that lower NOx emission limits are achievable for the Agrium emission units, as evidenced by the vendor quote obtained by AK LNG for their turbines. (I did not include our previous review of the Agrium BACT; please let me know if you would like me to resend it.)

The Agrium Solar turbines are much smaller units than the proposed turbines at the AK LNG liquefaction facility. In general, the “economy of scale” concept indicates that the smaller the unit, the lower the potential emissions reduction and the less cost-effective a measure becomes on a \$/ton basis. While we don’t have a cost evaluation for SCR on the Agrium turbines (a cost analysis is not required if a top-level control is selected), it is likely more expensive per ton of NOx removed to control the Agrium turbines than the AK LNG liquefaction facility turbines, calling AGDC’s economic feasibility determination into question.

We found several errors in AGDC’s BACT analysis and revised the analysis to correct these errors (attached). We understand that the Department also revised the AGDC analysis to update the bank prime interest rate and the PTE assumptions; however, we found additional assumptions that impact the direct annual costs. It also appears that in their 6th edition estimates, the applicant double counted some TCI fees by including CCM default calculations for line items that were also included in the vendor quote. All revisions to the cost analysis and the basis for our analysis assumptions are documented in the attached spreadsheets along with the “LF_ARD_analysis_assumptions_review_notes.docx” document. Our results indicate that SCR is much more cost-effective for the four power generation turbines and six compressor turbines at the LF facility than what AGDC’s analysis suggests.

Our estimates are summarized below, along with AGDC and ADEC reported results. (Note: The AGDC reported values are from the summary table on page 1 of the BACT information request response. The summary table values do not match the values reported in Appendix B – cost calculation spreadsheets, although they are close.)

- Liquefaction Facility Power Generation Turbines:
 - Our result – TCI based on EPA default method in the CCM, 7th edition: **\$5,873/ton** NOx removed (2019\$)
 - Our result –TCI based on revised vendor quote calculations: **\$6,041/ton** NOx removed (2019\$)
 - AGDC result: \$10,904/ton NOx removed (2017\$)
 - ADEC result: \$9,878/ton NOx removed
- Liquefaction Facility Compression Turbines:
 - Our result – TCI based on EPA default method in the CCM, 7th edition: **\$4,319/ton** to **\$4,987/ton** NOx removed (2019\$) for an SCR inlet temperature of 730° F and 970° F, respectively.
 - Our result –TCI based on revised vendor quote TCI calculations: **\$4,383/ton** to **\$5,051/ton** NOx removed (2019\$) for an SCR inlet temperature of 730° F and 970° F, respectively.
 - AGDC result: \$11,241/ton NOx removed (2017\$)
 - ADEC result: \$10,519/ton NOx removed

The revised cost estimates, including some of ADEC's own revised estimates, are within the range of cost-effective thresholds established by other states for BACT determinations (and, in some cases, analysis of retrofits). In their recently released draft Regional Haze SIP, Texas identified a \$10,000/ton threshold for BACT determinations.

Our BACT review focused on the NOx emissions because as we have noted previously throughout the various permitting and approval processes for this project (i.e., FERC process), we are concerned about the potential nitrogen deposition impacts to Air Quality Related Values (AQRVs) in Denali National Park.

Feel free to give me a call if you have any questions.

Regards,

Andrea Stacy

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Tuesday, October 13, 2020 4:55 PM

To: Dave Jordan <dave.jordan@erm.com>; Ted Hartman <Ted.Hartman@nutrien.com>

Cc: Frederick Werth <Frederick.Werth@nutrien.com>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>; Jack, Jesse R (DEC) <jesse.jack@alaska.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>

Subject: [EXTERNAL] Draft Preliminary Construction Permit AQ0083CPT07 for Agrium's Kenai Nitrogen Facility

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Dave and Ted,

The Alaska Department of Environmental Conservation (Department) has reviewed the Construction Permit Application AQ0083CPT07 for Agrium's Kenai Nitrogen Operations facility and is providing Nutrien with a copy of the draft permit, technical analysis report (TAR), and modeling report to review for technical accuracy. This is not a comment period, so please keep the scope of your comments to typographical and grammatical errors and correctness/completeness issues.

Note that the Department is concurrently sending the draft permit documents to the Federal Land Managers and EPA to begin their review and intends to public notice the preliminary permit on November 12, 2020 (30 days from today). Please review the permit, TAR, and modeling report and provide corrections to the Department by October 30, 2020, so that we have ample time to incorporate any suggested changes prior to the intended public notice date.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

^[1] A fundamental precept of BACT is that similar emission units in similar situations should have similar emission limits, unless it is demonstrated that there are significant differences; that demonstration has not been made.

From: [Stacy, Andrea](#)
To: [Birnbaum, Molly \(DEC\)](#); [Peters, Melanie](#); [Blakesley, Andrea J](#); [Allen, Tim](#); [Paul Burger](#); [Clark, Adam](#); [Hedgpeth, Zach](#); [Kotchenruther, Robert](#); [Goodfellow, Paul J \(DEC\)](#); [Simpson, Aaron J \(DEC\)](#); [Renovatio, James J \(DEC\)](#); [Jones, Dave F \(DEC\)](#); [Huff, Deanna M \(DEC\)](#); [Shepherd, Don](#); [King, Kirsten L](#); [Miller, Debra C](#)
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification
Date: Tuesday, September 15, 2020 4:08:23 PM
Attachments: [image002.png](#)
[Doswell Limited Partnership - Bubbling Fuel Use Limits 20170622.pptx](#)
[PA_FLM_MOU_ClassI_final_timeline.pdf](#)
[va_deq_mou.doc](#)

All,

Thank you for the call yesterday; we appreciate you keeping us up to date on AK permits and your RH planning process! I am following up regarding our discussion on FLM/NPS notification procedures for PSD permits in Alaska. I thought it would be helpful if I provide you with our interpretation of the requirements in 40 CFR 52.21 (p) for FLM notification and consultation. (It is my understanding that ADEC has incorporated 40 CFR 52.21 (p) – Sources impacting Federal Class I areas – additional requirements - by reference into the Alaska Code, 18 AAC 50.306, with the exception that the term “administrator” refers to the “department” rather than EPA in this section. Please let me know if this is not correct.)

I’ve outlined our expectations with respect to notification based on the 52.21 requirements and provided some examples of FLM notification and coordination procedures that work well in other states. The outline addresses notification elements that we believe are required in the regulations. The examples from other states also include coordination elements that are not required, but that facilitate an efficient process and avoid any surprises. (As I mentioned on the phone, we’ve been through this process many times before! The issue generally doesn’t come up unless there is a specific permit the FLMs are interested in that didn’t follow the notification procedures – if it isn’t broken, why fix it?)

Of course, any of the “nice-to-do” elements are tailored to a state’s individual process. While the examples from other states involved a MOU agreement, we do not believe that establishing a coordination process requires a formalized agreement.

Required Elements:

1. ***Advanced Notification*** - 40 CFR 52.21 (p)(1): *“Finally, the Administrator shall also notify all affected Federal land managers within 30 days of receipt of any advance notification of any such permit application.”*

This is a preliminary heads up that an application may be forthcoming. Thank you for providing this advanced notification yesterday regarding sources on the north slope.

2. ***Notice to Federal Land Managers - 40 CFR 52.21 (p)(1):*** *“Such notification **shall include a copy of all information relevant to the permit application** and shall be given within 30 days of receipt and **at least 60 days prior to any public hearing on the application** for a permit to construct. Such notification **shall include an analysis of the proposed source’s anticipated impacts on visibility** in the Federal Class I area. The Administrator **shall also provide** the Federal land manager and such Federal officials **with a copy of the preliminary determination** required under paragraph (q) of this*

section, and **shall make available to them any materials used in making that determination**, promptly after the Administrator makes such determination.” [Emphasis added.]

a. **All relevant information** – we consider this to include:

- i. The permit application.
- ii. An AQRV modeling analysis (including visibility) if applicable.
- iii. Detailed BACT analyses, including the cost analysis and the assumptions underlying those cost analyses.
- iv. State staff analyses.
- v. The preliminary state determination (draft permit).

This information is necessary to aid the FLM in making an impact determination, as required in 52.21 (p)(2). The language also specifies that the FLM shall be provided with a copy of the state’s “preliminary determination” and “any materials used in making that determination.” From a practical standpoint, it is difficult for the FLM to make a determination with respect to the anticipated impacts without knowing the state’s proposed course of action.

b. **Notification & response timeframes**; “within 30 days of receipt and at least 60 days prior to any public hearing on the application . . .”

The timeframe is crucial for allowing both the FLM and the state to comply with the requirements in 52.21(p)(2) & (p)(3). If the FLM makes an adverse impact determination within 30 days of receipt of the relevant information (52.21 (p)(2)), the state must address this determination under either paragraph 52.21 (p)(3), which requires the state to publish the FLM finding and the state’s determination in the public notice (if they disagree)^[1]; or paragraph (p)(4), which requires the state to deny the permit if they concur with the FLM’s adverse impact finding^[2].

From a practical standpoint, the timeline requires the FLM to receive the notice at least 60 days prior to a public hearing (in most states this occurs at the close of the public comment period). The FLM then has 30 days to provide a determination to the state (52.21(p)(3)), allowing the state to publish the FLM’s finding in the public notice.

Process examples from other states:

Pennsylvania: I’ve attached an excerpt from the MOU we negotiated with PA DEP, the FLMs and

EPA R3. (Please let me know if you'd like the entire MOU– I only included the relevant timeline excerpt because the document is long). Again, we are not suggesting that an MOU is necessary to ensure requirements are met, but it is a good example of a process that we feel meets the time frames and the intent of the Class I provisions specified in the regulations. The PA MOU also lays out the pieces of information we believe are relevant to the FLM review & when they should be provided during the process. A couple of specific notes:

1. PA has permit processing time limits outlined in their requirements – consequently, there is a rigid 180-day timeframe in the MOU for PSD permits. This is one reason PA DEP felt an MOU was necessary.
2. Under this timeline, the PA DEP will provide the FLMs, EPA R3, and the owner/operator with the draft permit *30 days prior to the public notice*. The reason for this time frame is that it allows the state to satisfy the public notification requirements to explain their response to *any adverse impact determination made by the FLM in the public notice* - in PA they had adopted 40 CFR 51.21 (p) by reference, similar to AK. This timeframe also satisfies the requirement to notify the FLM 60 days prior to the public hearing (at least within PA's process).

-
Virginia: I've attached an example of an FLM notification email and the associated PowerPoint because VA's process ensures early, clear communication on the AQRV analysis needs, avoiding oversights or miscommunications. Virginia calls this a "pre-application" meeting, but technically, we view this as falling within the application phase of the permit and satisfies the requirement to provide notice of the permit application "within 30 days of receipt." We agree a state is not required to provide information "pre-application," as the state may not receive pre-notification, but this approach is how VA prefers to address the notification requirement within their process, as it allows them to identify (or screen out) any AQRV analysis requirements early in the process. If AK's process occurred within the "30-days of receipt window," that would suffice. I think the key points from this example are:

1. The type of summary information VA is providing:
 - a. This notification clearly and concisely summarizes information regarding the facility proposal, including the project description, the proposed BACT and BACT limits, and information on the Class I areas affected.
 - b. It is the content, not the format that matters, i.e., this ppt is just one example, but the summary does not have to be in ppt format.
 - c. As an aside, we may not always agree with the applicant's conclusions regarding the need for a Class I analysis but having the information to make this determination is important.
2. There is a clear, direct request for FLM feedback/response. Again, the format does not need to be identical, but closing the loop is the important point.

Virginia's FLM notification process was also outlined in a MOU (with the USDA) which is now expired. The MOU has not been renewed but the parties continue to follow the process and a formal agreement is no longer necessary. I have also attached the language from this MOU for your reference.

West Virginia: Procedural improvements achieved in other states were the outcome of similar notification issues surrounding a specific permit. In West Virginia, notification issues were resolved without a formal agreement, but stemmed from procedural concerns for a specific permit.

Please let me know if you have any questions. We would like to have a follow-up conversation on the liquefaction facility once you have had a chance to review this information. Thanks again, and

we look forward to outlining a process that aligns with Alaska's program and meets the intent of the Class I provisions in the PSD regulations.

Regards,
Andrea Stacy

[1] 52.21(p)(3) Visibility analysis. The Administrator shall consider any analysis performed by the Federal land manager, provided within 30 days of the notification required by paragraph (p)(1) of this section, that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the Administrator finds that such an analysis does not demonstrate to the satisfaction of the Administrator that an adverse impact on visibility will result in the Federal Class I area, the Administrator must, in the notice of public hearing on the permit application, either explain his decision or give notice as to where the explanation can be obtained.

[1] (4) Denial—impact on air quality related values. The Federal Land Manager of any such lands may demonstrate to the Administrator that the emissions from a proposed source or modification would have an adverse impact on the air quality-related values (including visibility) of those lands, notwithstanding that the change in air quality resulting from emissions from such source or modification would not cause or contribute to concentrations which would exceed the maximum allowable increases for a Class I area. If the Administrator concurs with such demonstration, then he shall not issue the permit.

-----Original Appointment-----

From: Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>

Sent: Friday, September 4, 2020 1:59 PM

To: Peters, Melanie; Blakesley, Andrea J; Stacy, Andrea; neil.stichert@usda.gov; Allen, Tim; Striker, Donald; Clark, Adam; Hedgpeth, Zach; Kotchenruther, Robert; Goodfellow, Paul J (DEC); Simpson, Aaron J (DEC); Renovatio, James J (DEC); Jones, Dave F (DEC); Huff, Deanna M (DEC)

Subject: [EXTERNAL] FLM Meeting

When: Monday, September 14, 2020 9:00 AM-10:30 AM (UTC-09:00) Alaska.

Where: Microsoft Teams Meeting

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Happy Friday! I'd like to set up another FLM meeting (long overdue) before the 16th. I am proposing the following topics but am open to other topics. Please let me know if you have any

burning desire.

Topics for discussion:

1. Four factor analysis - methodology and selected facilities (Methodology document and source selected list will be distributed before the meeting for your review)
2. Permits under public notice
 - Controls proposed and costs
3. Fairbanks Coal EGUs - BACT
 - Controls and costs
 - Expected reduction in emissions

I am proposing Monday the 14th but I have a few other time slots that week if needed.

Monday: 8:00 or 10:00 (AK time)

Tuesday: 2:00 (AK time)

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[Learn more about Teams](#) | [Meeting options](#)

[\[1\]](#) 52.21(p)(3) Visibility analysis. The Administrator shall consider any analysis performed by the Federal land manager, provided within 30 days of the notification required by paragraph (p)(1) of this section, that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the Administrator finds that such an analysis does not demonstrate to the satisfaction of the Administrator that an adverse impact on visibility will result in the Federal Class I area, the Administrator must, in the notice of public hearing on the permit application, either explain his decision or give notice as to where the explanation can be obtained.

[\[2\]](#) (4) Denial—impact on air quality related values. The Federal Land Manager of any such lands may demonstrate to the Administrator that the emissions from a proposed source or modification would have an adverse impact on the air quality-related values (including visibility) of those lands, notwithstanding that the change in air quality resulting from emissions from such source or modification would not cause or contribute to concentrations which would exceed the maximum allowable increases for a Class I area. If the Administrator concurs with such demonstration, then he shall not issue the permit.

From: [Stacy, Andrea](#)
To: [Renovatio, James J \(DEC\)](#); [Birnbaum, Molly \(DEC\)](#); [Peters, Melanie](#); [Blakesley, Andrea J](#); [Allen, Tim](#); [Paul Burger](#); [Clark, Adam](#); [Hedgpeth, Zach](#); [Kotchenruther, Robert](#); [Goodfellow, Paul J \(DEC\)](#); [Simpson, Aaron J \(DEC\)](#); [Jones, Dave F \(DEC\)](#); [Huff, Deanna M \(DEC\)](#); [Shepherd, Don](#); [King, Kirsten L](#); [Miller, Debra C](#)
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification
Date: Wednesday, September 16, 2020 7:16:30 AM
Attachments: [image002.png](#)

Thanks James!

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Tuesday, September 15, 2020 9:08 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Clark, Adam <clark.adam@epa.gov>; Hedgpeth, Zach <hedgpeth.zach@epa.gov>; Kotchenruther, Robert <Kotchenruther.Robert@epa.gov>; Goodfellow, Paul J (DEC) <paul.goodfellow@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Huff, Deanna M (DEC) <deanna.huff@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Miller, Debra C <Debra_Miller@nps.gov>
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification

Hi Andrea,

Thank you for the follow-up and supplemental discussion. The Department Permits team will include these materials in our ongoing discussions. Best,

James

From: Stacy, Andrea <Andrea_Stacy@nps.gov>
Sent: Tuesday, September 15, 2020 4:01 PM
To: Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Paul Burger <Paul_Burger@nps.gov>; Clark, Adam <clark.adam@epa.gov>; Hedgpeth, Zach <hedgpeth.zach@epa.gov>; Kotchenruther, Robert <Kotchenruther.Robert@epa.gov>; Goodfellow, Paul J (DEC) <paul.goodfellow@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Huff, Deanna M (DEC) <deanna.huff@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Miller, Debra C <Debra_Miller@nps.gov>
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification

All,

Thank you for the call yesterday; we appreciate you keeping us up to date on AK permits and your RH planning process! I am following up regarding our discussion on FLM/NPS notification procedures for PSD permits in Alaska. I thought it would be helpful if I provide you with our

interpretation of the requirements in 40 CFR 52.21 (p) for FLM notification and consultation. (It is my understanding that ADEC has incorporated 40 CFR 52.21 (p) – Sources impacting Federal Class I areas – additional requirements - by reference into the Alaska Code, 18 AAC 50.306, with the exception that the term “administrator” refers to the “department” rather than EPA in this section. Please let me know if this is not correct.)

I’ve outlined our expectations with respect to notification based on the 52.21 requirements and provided some examples of FLM notification and coordination procedures that work well in other states. The outline addresses notification elements that we believe are required in the regulations. The examples from other states also include coordination elements that are not required, but that facilitate an efficient process and avoid any surprises. (As I mentioned on the phone, we’ve been through this process many times before! The issue generally doesn’t come up unless there is a specific permit the FLMs are interested in that didn’t follow the notification procedures – if it isn’t broken, why fix it?)

Of course, any of the “nice-to-do” elements are tailored to a state’s individual process. While the examples from other states involved a MOU agreement, we do not believe that establishing a coordination process requires a formalized agreement.

Required Elements:

1. ***Advanced Notification*** - 40 CFR 52.21 (p)(1): *“Finally, the Administrator shall also notify all affected Federal land managers within 30 days of receipt of any advance notification of any such permit application.”*

This is a preliminary heads up that an application may be forthcoming. Thank you for providing this advanced notification yesterday regarding sources on the north slope.

2. ***Notice to Federal Land Managers - 40 CFR 52.21 (p)(1)***: *“Such notification **shall include a copy of all information relevant to the permit application** and shall be given within 30 days of receipt and **at least 60 days prior to any public hearing on the application** for a permit to construct. Such notification **shall include an analysis of the proposed source’s anticipated impacts on visibility** in the Federal Class I area. The Administrator **shall also provide** the Federal land manager and such Federal officials **with a copy of the preliminary determination** required under paragraph (q) of this section, and **shall make available to them any materials used in making that determination**, promptly after the Administrator makes such determination.”* [Emphasis added.]

a. **All relevant information** – we consider this to include:

- i. The permit application.
- ii. An AQRV modeling analysis (including visibility) if applicable.
- iii. Detailed BACT analyses, including the cost analysis and the assumptions underlying those cost analyses.
- iv. State staff analyses.

v. The preliminary state determination (draft permit).

This information is necessary to aid the FLM in making an impact determination, as required in 52.21 (p)(2). The language also specifies that the FLM shall be provided with a copy of the state's "preliminary determination" and "any materials used in making that determination." From a practical standpoint, it is difficult for the FLM to make a determination with respect to the anticipated impacts without knowing the state's proposed course of action.

b. **Notification & response timeframes**; "within 30 days of receipt and at least 60 days prior to any public hearing on the application . . ."

The timeframe is crucial for allowing both the FLM and the state to comply with the requirements in 52.21(p)(2) & (p)(3). If the FLM makes an adverse impact determination within 30 days of receipt of the relevant information (52.21 (p)(2)), the state must address this determination under either paragraph 52.21 (p)(3), which requires the state to publish the FLM finding and the state's determination in the public notice (if they disagree)^[1]; or paragraph (p)(4), which requires the state to deny the permit if they concur with the FLM's adverse impact finding^[2].

From a practical standpoint, the timeline requires the FLM to receive the notice at least 60 days prior to a public hearing (in most states this occurs at the close of the public comment period). The FLM then has 30 days to provide a determination to the state (52.21(p)(3)), allowing the state to publish the FLM's finding in the public notice.

Process examples from other states:

Pennsylvania: I've attached an excerpt from the MOU we negotiated with PA DEP, the FLMs and EPA R3. (Please let me know if you'd like the entire MOU– I only included the relevant timeline excerpt because the document is long). Again, we are not suggesting that an MOU is necessary to ensure requirements are met, but it is a good example of a process that we feel meets the time frames and the intent of the Class I provisions specified in the regulations. The PA MOU also lays out the pieces of information we believe are relevant to the FLM review & when they should be provided during the process. A couple of specific notes:

1. PA has permit processing time limits outlined in their requirements – consequently, there is a rigid 180-day timeframe in the MOU for PSD permits. This is one reason PA DEP felt an MOU was necessary.
2. Under this timeline, the PA DEP will provide the FLMs, EPA R3, and the owner/operator with the draft permit *30 days prior to the public notice*. The reason for this time frame is that it allows the state to satisfy the public notification requirements to explain their response to *any adverse impact determination made by the FLM in the public notice* - in PA they had adopted 40 CFR 51.21 (p) by reference, similar to AK. This timeframe also satisfies the requirement to notify the FLM 60 days prior to the public hearing (at least within PA's process).

Virginia: I've attached an example of an FLM notification email and the associated PowerPoint because VA's process ensures early, clear communication on the AQRV analysis needs, avoiding oversights or miscommunications. Virginia calls this a "pre-application" meeting, but technically, we view this as falling within the application phase of the permit and satisfies the requirement to provide notice of the permit application "within 30 days of receipt." We agree a state is not required to provide information "pre-application," as the state may not receive pre-notification, but this approach is how VA prefers to address the notification requirement within their process, as it allows them to identify (or screen out) any AQRV analysis requirements early in the process. If AK's process occurred within the "30-days of receipt window," that would suffice. I think the key points from this example are:

1. The type of summary information VA is providing:
 - a. This notification clearly and concisely summarizes information regarding the facility proposal, including the project description, the proposed BACT and BACT limits, and information on the Class I areas affected.
 - b. It is the content, not the format that matters, i.e., this ppt is just one example, but the summary does not have to be in ppt format.
 - c. As an aside, we may not always agree with the applicant's conclusions regarding the need for a Class I analysis but having the information to make this determination is important.
2. There is a clear, direct request for FLM feedback/response. Again, the format does not need to be identical, but closing the loop is the important point.

Virginia's FLM notification process was also outlined in a MOU (with the USDA) which is now expired. The MOU has not been renewed but the parties continue to follow the process and a formal agreement is no longer necessary. I have also attached the language from this MOU for your reference.

West Virginia: Procedural improvements achieved in other states were the outcome of similar notification issues surrounding a specific permit. In West Virginia, notification issues were resolved without a formal agreement, but stemmed from procedural concerns for a specific permit.

Please let me know if you have any questions. We would like to have a follow-up conversation on the liquefaction facility once you have had a chance to review this information. Thanks again, and we look forward to outlining a process that aligns with Alaska's program and meets the intent of the Class I provisions in the PSD regulations.

Regards,
Andrea Stacy

[1] 52.21(p)(3) Visibility analysis. The Administrator shall consider any analysis performed by the Federal land manager, provided within 30 days of the notification required by paragraph (p)(1) of this section, that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the Administrator finds that such an analysis does not demonstrate to the satisfaction of the Administrator that an adverse impact on visibility will result in the Federal Class I area, the Administrator must, in the notice of public hearing on the permit application, either explain his decision or give

notice as to where the explanation can be obtained.

[1] (4) Denial—impact on air quality related values. The Federal Land Manager of any such lands may demonstrate to the Administrator that the emissions from a proposed source or modification would have an adverse impact on the air quality-related values (including visibility) of those lands, notwithstanding that the change in air quality resulting from emissions from such source or modification would not cause or contribute to concentrations which would exceed the maximum allowable increases for a Class I area. If the Administrator concurs with such demonstration, then he shall not issue the permit.

-----Original Appointment-----

From: Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>

Sent: Friday, September 4, 2020 1:59 PM

To: Peters, Melanie; Blakesley, Andrea J; Stacy, Andrea; neil.stichert@usda.gov; Allen, Tim; Striker, Donald; Clark, Adam; Hedgpeth, Zach; Kotchenruther, Robert; Goodfellow, Paul J (DEC); Simpson, Aaron J (DEC); Renovatio, James J (DEC); Jones, Dave F (DEC); Huff, Deanna M (DEC)

Subject: [EXTERNAL] FLM Meeting

When: Monday, September 14, 2020 9:00 AM-10:30 AM (UTC-09:00) Alaska.

Where: Microsoft Teams Meeting

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Happy Friday! I'd like to set up another FLM meeting (long overdue) before the 16th. I am proposing the following topics but am open to other topics. Please let me know if you have any burning desire.

Topics for discussion:

1. Four factor analysis - methodology and selected facilities (Methodology document and source selected list will be distributed before the meeting for your review)
2. Permits under public notice
 - Controls proposed and costs
3. Fairbanks Coal EGUs - BACT
 - Controls and costs
 - Expected reduction in emissions

I am proposing Monday the 14th but I have a few other time slots that week if needed.

Monday: 8:00 or 10:00 (AK time)

Tuesday: 2:00 (AK time)

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[\[1\]](#) 52.21(p)(3) Visibility analysis. The Administrator shall consider any analysis performed by the Federal land manager, provided within 30 days of the notification required by paragraph (p)(1) of this section, that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the Administrator finds that such an analysis does not demonstrate to the satisfaction of the Administrator that an adverse impact on visibility will result in the Federal Class I area, the Administrator must, in the notice of public hearing on the permit application, either explain his decision or give notice as to where the explanation can be obtained.

[\[2\]](#) (4) Denial—impact on air quality related values. The Federal Land Manager of any such lands may demonstrate to the Administrator that the emissions from a proposed source or modification would have an adverse impact on the air quality-related values (including visibility) of those lands, notwithstanding that the change in air quality resulting from emissions from such source or modification would not cause or contribute to concentrations which would exceed the maximum allowable increases for a Class I area. If the Administrator concurs with such demonstration, then he shall not issue the permit.

From: [Stacy, Andrea](#)
To: [Renovatio, James J \(DEC\)](#); [Simpson, Aaron J \(DEC\)](#); [Jones, Dave F \(DEC\)](#)
Cc: [King, Kirsten L](#); [Shepherd, Don](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Collins, Catherine](#)
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification
Date: Friday, September 25, 2020 3:46:10 PM
Attachments: [image002.png](#)

Dave, James and Aaron,

We appreciate ADEC taking the time to discuss AK permits with the FLMs. In response to our FLM notification discussions, we are requesting additional FLM review time for the liquefaction facility permit, consistent with the timeframes outlined below (i.e., at least 60 days).

Now that we have the draft permit and TAR, we have technical questions related to the proposal and the AQRV modeling analysis submitted in support of the application. Additional review time would allow the FLMs to work through these questions with ADEC staff and complete our review with the full suite of necessary information. This information is essential for evaluating potential AQRV impacts to the NPS Class I area (as we are required to do in 40 CFR 52.21).

In advance, thank you for your consideration of this request.

Regards,
Andrea

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Tuesday, September 15, 2020 9:08 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Clark, Adam <clark.adam@epa.gov>; Hedgpeth, Zach <hedgpeth.zach@epa.gov>; Kotchenruther, Robert <Kotchenruther.Robert@epa.gov>; Goodfellow, Paul J (DEC) <paul.goodfellow@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Huff, Deanna M (DEC) <deanna.huff@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Miller, Debra C <Debra_Miller@nps.gov>
Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification

Hi Andrea,

Thank you for the follow-up and supplemental discussion. The Department Permits team will include these materials in our ongoing discussions. Best,

James

From: Stacy, Andrea <Andrea_Stacy@nps.gov>

Sent: Tuesday, September 15, 2020 4:01 PM

To: Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Paul Burger <Paul_Burger@nps.gov>; Clark, Adam <clark.adam@epa.gov>; Hedgpeth, Zach <hedgpeth.zach@epa.gov>; Kotchenruther, Robert <Kotchenruther.Robert@epa.gov>; Goodfellow, Paul J (DEC) <paul.goodfellow@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Huff, Deanna M (DEC) <deanna.huff@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Miller, Debra C <Debra_Miller@nps.gov>

Subject: RE: [EXTERNAL] FLM Meeting - Follow-up on FLM Notification

All,

Thank you for the call yesterday; we appreciate you keeping us up to date on AK permits and your RH planning process! I am following up regarding our discussion on FLM/NPS notification procedures for PSD permits in Alaska. I thought it would be helpful if I provide you with our interpretation of the requirements in 40 CFR 52.21 (p) for FLM notification and consultation. (It is my understanding that ADEC has incorporated 40 CFR 52.21 (p) – Sources impacting Federal Class I areas – additional requirements - by reference into the Alaska Code, 18 AAC 50.306, with the exception that the term “administrator” refers to the “department” rather than EPA in this section. Please let me know if this is not correct.)

I’ve outlined our expectations with respect to notification based on the 52.21 requirements and provided some examples of FLM notification and coordination procedures that work well in other states. The outline addresses notification elements that we believe are required in the regulations. The examples from other states also include coordination elements that are not required, but that facilitate an efficient process and avoid any surprises. (As I mentioned on the phone, we’ve been through this process many times before! The issue generally doesn’t come up unless there is a specific permit the FLMs are interested in that didn’t follow the notification procedures – if it isn’t broken, why fix it?)

Of course, any of the “nice-to-do” elements are tailored to a state’s individual process. While the examples from other states involved a MOU agreement, we do not believe that establishing a coordination process requires a formalized agreement.

Required Elements:

1. ***Advanced Notification*** - 40 CFR 52.21 (p)(1): “*Finally, the Administrator shall also notify all affected Federal land managers within 30 days of receipt of any advance notification of any such permit application.*”

This is a preliminary heads up that an application may be forthcoming. Thank you for providing this advanced notification yesterday regarding sources on the north slope.

2. ***Notice to Federal Land Managers*** - 40 CFR 52.21 (p)(1): “*Such notification shall include a copy of all information relevant to the permit application and shall be given within 30 days of receipt and at least 60 days prior to any public hearing on the*

***application** for a permit to construct. Such notification **shall include an analysis of the proposed source’s anticipated impacts on visibility** in the Federal Class I area. The Administrator **shall also provide** the Federal land manager and such Federal officials **with a copy of the preliminary determination** required under paragraph (q) of this section, and **shall make available to them any materials used in making that determination**, promptly after the Administrator makes such determination.” [Emphasis added.]*

a. **All relevant information** – we consider this to include:

- i. The permit application.
- ii. An AQRV modeling analysis (including visibility) if applicable.
- iii. Detailed BACT analyses, including the cost analysis and the assumptions underlying those cost analyses.
- iv. State staff analyses.
- v. The preliminary state determination (draft permit).

This information is necessary to aid the FLM in making an impact determination, as required in 52.21 (p)(2). The language also specifies that the FLM shall be provided with a copy of the state’s “preliminary determination” and “any materials used in making that determination.” From a practical standpoint, it is difficult for the FLM to make a determination with respect to the anticipated impacts without knowing the state’s proposed course of action.

b. **Notification & response timeframes**; “within 30 days of receipt and at least 60 days prior to any public hearing on the application . . .”

The timeframe is crucial for allowing both the FLM and the state to comply with the requirements in 52.21(p)(2) & (p)(3). If the FLM makes an adverse impact determination within 30 days of receipt of the relevant information (52.21 (p)(2)), the state must address this determination under either paragraph 52.21 (p)(3), which requires the state to publish the FLM finding and the state’s determination in the public notice (if they disagree)^[1]; or paragraph (p)(4), which requires the state to deny the permit if they concur with the FLM’s adverse impact finding^[2].

From a practical standpoint, the timeline requires the FLM to receive the notice at least 60 days prior to a public hearing (in most states this occurs at the close of the public comment period). The FLM then has 30 days to provide a determination to the state (52.21(p)(3)), allowing the state to publish the FLM’s finding in the public notice.

Process examples from other states:

Pennsylvania: I've attached an excerpt from the MOU we negotiated with PA DEP, the FLMs and EPA R3. (Please let me know if you'd like the entire MOU— I only included the relevant timeline excerpt because the document is long). Again, we are not suggesting that an MOU is necessary to ensure requirements are met, but it is a good example of a process that we feel meets the time frames and the intent of the Class I provisions specified in the regulations. The PA MOU also lays out the pieces of information we believe are relevant to the FLM review & when they should be provided during the process. A couple of specific notes:

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-
Virginia: I've attached an example of an FLM notification email and the associated PowerPoint because VA's process ensures early, clear communication on the AQRV analysis needs, avoiding oversights or miscommunications. Virginia calls this a "pre-application" meeting, but technically, we view this as falling within the application phase of the permit and satisfies the requirement to provide notice of the permit application "within 30 days of receipt." We agree a state is not required to provide information "pre-application," as the state may not receive pre-notification, but this approach is how VA prefers to address the notification requirement within their process, as it allows them to identify (or screen out) any AQRV analysis requirements early in the process. If AK's process occurred within the "30-days of receipt window," that would suffice. I think the key points from this example are:

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West Virginia: Procedural improvements achieved in other states were the outcome of similar notification issues surrounding a specific permit. In West Virginia, notification issues were resolved without a formal agreement, but stemmed from procedural concerns for a specific permit.

Please let me know if you have any questions. We would like to have a follow-up conversation on the liquefaction facility once you have had a chance to review this information. Thanks again, and we look forward to outlining a process that aligns with Alaska's program and meets the intent of the Class I provisions in the PSD regulations.

Regards,
Andrea Stacy

[1] 52.21(p)(3) Visibility analysis. The Administrator shall consider any analysis performed by the Federal land manager, provided within 30 days of the notification required by paragraph (p)(1) of this section, that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any Federal Class I area. Where the Administrator finds that such an analysis does not demonstrate to the satisfaction of the Administrator that an adverse impact on visibility will result in the Federal Class I area, the Administrator must, in the notice of public hearing on the permit application, either explain his decision or give notice as to where the explanation can be obtained.

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-----Original Appointment-----

From: Birnbaum, Molly (DEC) <molly.birnbaum@alaska.gov>

Sent: Friday, September 4, 2020 1:59 PM

To: Peters, Melanie; Blakesley, Andrea J; Stacy, Andrea; neil.stichert@usda.gov; Allen, Tim; Striker, Donald; Clark, Adam; Hedgpeth, Zach; Kotchenruther, Robert; Goodfellow, Paul J (DEC); Simpson, Aaron J (DEC); Renovatio, James J (DEC); Jones, Dave F (DEC); Huff, Deanna M (DEC)

Subject: [EXTERNAL] FLM Meeting

When: Monday, September 14, 2020 9:00 AM-10:30 AM (UTC-09:00) Alaska.

Where: Microsoft Teams Meeting

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Happy Friday! I'd like to set up another FLM meeting (long overdue) before the 16th. I am

proposing the following topics but am open to other topics. Please let me know if you have any burning desire.

Topics for discussion:

1. Four factor analysis - methodology and selected facilities (Methodology document and source selected list will be distributed before the meeting for your review)
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 - Controls proposed and costs
3. Fairbanks Coal EGUs - BACT
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 - Expected reduction in emissions

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Tuesday: 2:00 (AK time)

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From: [Collins, Catherine](#)
To: [Jones, Dave F \(DEC\)](#)
Subject: Re: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications
Date: Friday, September 18, 2020 8:24:07 AM

Hi Dave,

That works. Thanks for scheduling.

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Thursday, September 17, 2020 5:46 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Subject: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications

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Everyone,

I am looking for a time next week that would work for folks to set up a one hour meeting to discuss the AGDC Liquefaction Plant construction permit and future FLM Notifications. I talked with Andrea Stacy already and she said that her NPS team was all available next Thursday 9/24 from 12 to 3 PM mountain time (10 – 1 AK time). Can anyone not make a meeting during this time frame who would like to attend? If so we can open up the possible meeting times to a wider window.

If there is anyone else who I should include in the meeting invite please let me know.

Regards,

Dave Jones

Env. Engineering Assistant II

ADEC – Air Quality – Juneau

dave.jones2@alaska.gov

907.465.5122

From: [Allen, Tim](#)
To: [Jones, Dave F \(DEC\)](#)
Subject: Re: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications
Date: Friday, September 18, 2020 9:03:22 AM

Hi Dave,

Is there a number I can call you at? I tried your office but am not sure if you answer that at home...

Tim Allen

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Thursday, September 17, 2020 5:46 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Subject: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications

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Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau

dave.jones2@alaska.gov

907.465.5122

From: [Allen, Tim](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [Renovatio, James J \(DEC\)](#); [Simpson, Aaron J \(DEC\)](#)
Subject: Re: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications
Date: Friday, September 18, 2020 10:36:48 AM

Tried calling a couple more times. Not sure it forwarded. I am at 303-914-3802 right now...

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Friday, September 18, 2020 11:42 AM
To: Allen, Tim <tim_allen@fws.gov>
Cc: Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>
Subject: RE: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications

Tim,

I was getting a late start to the day this morning so I missed your call, which forwards from my office phone to my cell phone, but I don't see your actual number in my missed call log. I tried to call your office yesterday before I sent the email, but didn't leave a voicemail after I heard that you weren't checking it frequently. Is there a good number I can reach you at so that I can bring James into the call?

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Allen, Tim <tim_allen@fws.gov>
Sent: Friday, September 18, 2020 9:03 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Re: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications

Hi Dave,

Is there a number I can call you at? I tried your office but am not sure if you answer that at home...

Tim Allen

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Sent: Thursday, September 17, 2020 5:46 PM

To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>

Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>

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Cc: [Simpson, Aaron J \(DEC\)](#); [Renovatio, James J \(DEC\)](#)
Subject: Re: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications
Date: Friday, September 18, 2020 6:30:08 AM

That works for me
Tim Allen

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Sent: Thursday, September 17, 2020 5:46 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Allen, Tim <tim_allen@fws.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Subject: [EXTERNAL] Possible Meeting Time Next Week to Discuss AGDC Liquefaction Plant and FLM Notifications

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Everyone,

I am looking for a time next week that would work for folks to set up a one hour meeting to discuss the AGDC Liquefaction Plant construction permit and future FLM Notifications. I talked with Andrea Stacy already and she said that her NPS team was all available next Thursday 9/24 from 12 to 3 PM mountain time (10 – 1 AK time). Can anyone not make a meeting during this time frame who would like to attend? If so we can open up the possible meeting times to a wider window.

If there is anyone else who I should include in the meeting invite please let me know.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [King, Kirsten L](#); [Shepherd, Don](#); [Blakesley, Andrea J](#); [Paul Burger](#)
Subject: RE: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit
Date: Thursday, December 3, 2020 1:25:18 PM

Hi Dave,

Looking at NPS calendars, I think either Friday (12/4) at 11:00 MT or Monday (12/7) at 10:30 MT would work for us.

For the benefit of the other NPS folks (who didn't hear the voicemails), the goal of this call would be to give ADEC staff a heads up re: the nature of our draft comments in advance of the public comment period closure, and give you a chance to ask any questions regarding the information sent to date, correct? With that in mind, I want to let you know that we revised our BACT analysis review in response to additional information submitted by the applicant subsequent to our October 26 email. I will send this revised analysis shortly, so you have it prior to our discussion. Thanks Dave & we'll talk with you soon!

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Thursday, December 3, 2020 11:58 AM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Subject: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Andrea,

I called you back earlier and got a busy signal, but we are available to meet and discuss the Liquefaction Facility tomorrow pretty much all day. The only possible conflict on our schedule is from 9 to 9:30 Mountain Time, so if we could avoid that everything else works. Next Monday the 7th we are open from 10:30 to 2:30 Mountain time. Let me know what works for you and I can send out a Teams meeting invite.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov

907.465.5122

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [King, Kirsten L](#); [Shepherd, Don](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Plosay, James R \(DEC\)](#); [Simpson, Aaron J \(DEC\)](#); [Renovatio, James J \(DEC\)](#); [Collins, Catherine](#)
Subject: RE: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit
Date: Friday, December 4, 2020 7:43:24 AM
Attachments: [AK LNG NPS Review of Combustion Turbines NOx BACT.docx](#)
[Revised-11ARD AKLNG LNG-LF Compression turbines Revised-vendor-TCI Revised-electricity costs-AGDC-r-revised-inlet-temp.xlsm](#)
[Revised-11-9-20-ARD AKLNG LNG-LF PG turbines Revised-vendor-TCI revised-electricity-costs-AGDC-r-inlet-temp.xlsm](#)

Thanks Dave.

As I mentioned in my last email, we have revised our technical analysis of the NOx BACT evaluation (initially sent on 10/26/2020) based on subsequent information provided by AGDC on 11/9/2020, as well as staff-level discussions between our agencies. The revised technical analysis is attached.

We continue to recommend that SCR may be economically feasible and is necessary to address potential nitrogen deposition impact concerns in Denali National Park. This includes potential declines in lichen communities in the south end of the park that are an important component of park ecosystems, as well as potential impacts to a globally rare lichen species that is listed as critically endangered by the International Union for Conservation of Nature (IUCN). (This species was only recently discovered at several sites within and near Denali NP. These populations are the only known occurrences within the US and western North America.) Our draft comments discuss the nature of these impacts in greater detail.

Thanks and we look forward to talking with you at 11!

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Thursday, December 3, 2020 3:30 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Cc: King, Kirsten L <kirsten_king@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Subject: RE: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit

Andrea,

That synopsis of the reason for the meeting sounds spot on to me. I will send out an invite for tomorrow at 11:00 MT shortly to everyone in this email thread. Just an FYI this meeting will be considered Ex Parte for us because the permit is already in public comment, so we will plan on recording the meeting in Teams to keep a record.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Stacy, Andrea <Andrea_Stacy@nps.gov>
Sent: Thursday, December 3, 2020 1:25 PM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Cc: King, Kirsten L <kirsten_king@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>
Subject: RE: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit

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To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Subject: [EXTERNAL] Possible Meeting Times for NPS Comments on Liquefaction Permit

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Regards,

Dave Jones

Env. Engineering Assistant II

ADEC – Air Quality – Juneau

dave.jones2@alaska.gov

907.465.5122

From: [Collins, Catherine](#)
To: [Jones, Dave F \(DEC\)](#)
Subject: Re: [EXTERNAL] RE: Alaska LNG
Date: Tuesday, September 22, 2020 2:55:22 PM

Hi Dave,

Just a couple of quick questions. In the modeling inputs the stack heights for the flares was set at 2 m. Is that correct. I would expect the flare stacks to be taller. Also do you know how the max situation for the flares. Would they all be running at one time and how long would they run for?

That will help us put it into the modeling run that we are doing. Tim and I have been working with the emissions and model and should have an answer for normal operations by the morning. We just want to figure out a good estimate for the max 24 hour to see if that makes any difference.

Thanks for your help.
-- Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Tuesday, September 22, 2020 12:46 PM
To: Collins, Catherine <Catherine_Collins@fws.gov>
Subject: [EXTERNAL] RE: Alaska LNG

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Here you go Catherine.

Regards,

Dave Jones

Env. Engineering Assistant II

ADEC – Air Quality – Juneau

dave.jones2@alaska.gov

907.465.5122

From: Collins, Catherine <Catherine_Collins@fws.gov>

Sent: Tuesday, September 22, 2020 7:34 AM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: Alaska LNG

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,

Catherine

Catherine Collins

Environmental Engineer

Branch of Air and Water Resources

7333 W. Jefferson Ave, Suite 375

Lakewood, CO 80235

303-914-3807

303-969-5444 fax

Catherine_Collins@fws.gov

From: [Stacy, Andrea](#)
To: [Renovatio, James J \(DEC\)](#)
Cc: [Jones, Dave F \(DEC\)](#); [Shepherd, Don](#); [King, Kirsten L](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Collins, Catherine](#); [Allen, Tim](#)
Subject: RE: [EXTERNAL] RE: Alaska LNG
Date: Friday, September 25, 2020 3:40:34 PM

Thanks James!

I have a couple of quick follow-up questions:

1. I want to clarify to make sure I understand one of your statements. You said “As a practical matter, other high-emission units (such as the turbines) would not be operating – ***some or all*** – during facility upset or maintenance operations that necessitate maximum flaring regimes.” Does this mean that whenever the flares are operating in this “maximum” scenario, none of the turbines will be operating? Is there a potential situation (startup, shutdown or maintenance of just one of the trains) that would result in some of the flares and some of the turbines/trains operating simultaneously? If so, what is the maximum (realistic) combination of flares/turbines? Did they provide SSSD or maintenance emission assumptions/scenarios?
2. It appears that if each of the flares were to operate at the maximum permitted level annually (@ 0.068 lb/MMBtu & 500 hrs/yr), the annual NOx emissions from the flares alone would exceed the estimated facility-wide PTE provided in the draft TAR (we note that there are no annual limits included in the draft permit for any of the emission units). For example, if you look at the estimated annual emissions for each individual flare unit (EUs 14-19), the maximum annual emissions from just the flares (limited to 500 hrs/yr) exceed the reported facility-wide PTE reported at the bottom of table 12 and in table 10 of the TAR. Can you please clarify this?
3. Is there a facility diagram that you could share with us?

Thanks!

-Andrea

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Thursday, September 24, 2020 1:53 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Subject: FW: [EXTERNAL] RE: Alaska LNG

FWD for you.

From: Renovatio, James J (DEC)
Sent: Wednesday, September 23, 2020 6:57 AM
To: Catherine Collins <Catherine_Collins@fws.gov>
Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Catherine,

Dave forwarded me your questions; here's some information that may help you and Tim in your current Liquefaction Facility modeling efforts.

AGDC modeled the proposed low-pressure flare with an elevated release height of just under 65 meters. They modeled their proposed ground flares with release heights of about two meters each as I recall. It is worth noting that there is an assumed modeled base elevation of about 40 meters in all cases. AGDC indicated that these modeled release heights are 'effective' heights (due to plume dynamics) for their flares, which they developed using Department guidance; I believe this refers to our Modeling Review Procedures Manual. The 'as-designed' release heights for the flares are specified in their application materials and appear to be close to what was modeled – about 60 and 0 meters, respectively.

Regarding operation, the flares are assumed to operate more-or-less continuously under a low-level pilot/purge operating regime. Given the nature of the equipment, however, infrequent or episodic relief/upset regimes are also assumed. For the low-pressure elevated flare, relief/upset operation is assumed at 144 hours/year; for the ground flares, this regime is assumed at 500 hours/year. Both pilot/purge and relief/upset operation are contemporaneously and conservatively reflected in AGDC's modeling.

To help you refine your assumptions, the three ground flares will consist of pairs of wet/dry flares (six releases total). Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints. AGDC indicates that their ambient demonstration is characterized by emissions from the dry ground flares alone, which generally would be the more conservative case for ambient impacts. They also indicate that the flares are rated as smokeless in design if you are referencing AP-42 factors in your assessment(s). Each ground flare is specified as capable of handling half of the facility's maximum flaring need. This means only two would theoretically operate at the same time - one would be redundant.

It is worth noting that even with 24-hours of maximum relief impacts from the ground flares, buoyant plume notwithstanding, impacts of significance at or around Tuxedni, the nearest Class I area, are unlikely at 86 kilometers distant; I would, however, anticipate elevated gaseous impacts in the near-field though. As a practical matter, other high-emission units (such as the turbines) would not be operating – some or all – during facility upset or maintenance operations that necessitate maximum flaring regimes. In this regard, AGDC's ambient demonstration is somewhat conservative. For your reference, results of their VISCREEN and CALPUFF modeling efforts (w.r.t. impacts in and near Class I and Class II sensitive) are summarized in Appendix D to Resource Report 9 (there is overlap in the NEPA and PSD app, but the relevant content is the same).

That being said, the Permits team welcomes input from FLM stakeholders. Let me know if you have any additional technical questions. Best,

James

From: Collins, Catherine <Catherine_Collins@fws.gov>
Sent: Tuesday, September 22, 2020 2:55 PM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Re: [EXTERNAL] RE: Alaska LNG

Hi Dave,

Just a couple of quick questions. In the modeling inputs the stack heights for the flares was set at 2 m. Is that correct. I would expect the flare stacks to be taller. Also do you know how the max situation for the flares. Would they all be running at one time and how long would they run for?

That will help us put it into the modeling run that we are doing. Tim and I have been working with the emissions and model and should have an answer for normal operations by the morning. We just want to figure out a good estimate for the max 24 hour to see if that makes any difference.

Thanks for your help.
-- Catherine

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Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Tuesday, September 22, 2020 12:46 PM
To: Collins, Catherine <Catherine_Collins@fws.gov>
Subject: [EXTERNAL] RE: Alaska LNG

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--

Here you go Catherine.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Collins, Catherine <Catherine_Collins@fws.gov>
Sent: Tuesday, September 22, 2020 7:34 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Alaska LNG

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,
Catherine

Catherine Collins
Environmental Engineer
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From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#); [Renovatio, James J \(DEC\)](#)
Cc: [Shepherd, Don](#); [King, Kirsten L](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Collins, Catherine](#); [Allen, Tim](#); [Simpson, Aaron J \(DEC\)](#)
Subject: RE: [EXTERNAL] RE: Alaska LNG
Date: Monday, September 28, 2020 3:53:36 PM

Thanks Dave,

That is helpful – I couldn't reconcile the annual estimated PTE reported in the TAR (not in the permit) with the unit-by-unit permit limits, so that answers my question. I want to restate my understanding of your responses (to ensure I don't mischaracterize what ADEC has conveyed thus far), and ask a few follow-up questions, which are all summarized below.

Annual Facility-wide Emissions:

On an *annual* basis, there is nothing in the permit that would prevent them from operating each of the wet and dry flares for up to the 500 hours/year. This affects the estimated *annual* PTE, and as specified in the TAR, and excludes any emergency flaring for upset conditions, for which there are no annual or short-term limits. Therefore, the "maximum" flaring emissions for up to 500 hours per year are part of routine maintenance operations at the facility, and based on the permit, the allowable 500 hours of operation (again, non-emergency) *could occur at each of the flares* annually. Is this correct?

Short-term Emissions:

As to the short-term emissions question, based on James' email & the TAR, the wet and dry flares are unlikely to operate simultaneously: "Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints." This is partly why I was requesting a facility process block diagram . . . it would be helpful in understanding what processes/units are connected. As to the diagrams, I saw maps of the facility layout in the resource report materials previously submitted, but I have not located (or relocated) a block diagram of facility processes – maybe you could help me refresh my memory as to where to find one if available?

Furthermore, the 3rd flare is redundant. On a short term basis, only two of the flares would be operating in any given hour, as two flares can handle the entire facility capacity.

Flares + Turbines:

James also notes: "The non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating equipment/processes of significance." Meaning some of the turbines, but possibly not all of the turbines would be shut down during routine flaring operations. Again, there are no limits in the permit defining when the flares can operate and what other equipment can operate when the flares are in use. Given this, we have several follow-up questions related to realistic scenarios for simultaneous operation because as was noted, this was not modeled by AGDC:

1. Power turbines: We assume power generation would be necessary for facility operations at all times, even when the flares are in use. Is this correct, would the power turbines continue to operate when the flares are operating and if so how many? Possibly all four?
2. Compressor turbines: There are two compression turbines per train. What trains/flares

combinations are likely to occur simultaneously during the maximum 24-hour period (e.g. 2 trains + 1 dry flare or 2 dry flares + 2 trains)? Again, we are looking for the maximum possible hourly combinations – we don't need all of the possible permutations.

Thanks, we appreciate your help!

-Andrea

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Monday, September 28, 2020 2:12 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>

Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Andrea,

Regarding question No. 2 on flaring PTE:

It is true that the 6 ground flares (EUs 14 -19) operating at 500 hours/year would exceed the PTE for the whole facility. The reason that PTE for the facility is lower is because we assumed that only two of the dry flares and two of the wet flares would be operating at maximum capacity at any given time at full bore (55.2 MMscfh for each dry flare and 12.9 MMscfh for each wet flare) because they are each designed to handle 50% of the facility flaring requirements (2.7 billion scf/day of feed gas). However, I did not convey this assumption properly in PTE Table 12 of the technical analysis report.

Regarding annual limits for the flares EUs 14-20:

Condition 17.2 of the preliminary permit limits the number of hours EUs 14 through 19 flare to no more than 500 hours each, and EU 20 flares to no more than 144 hours, during startup, shutdown, and maintenance events, in any 12 consecutive months. We did not limit the amount of time that flaring could take place during an emergency or process upset as the flares are considered a control device to prevent raw gas from being vented to the atmosphere in the event of an emergency.

If you have any other questions as you continue to review the preliminary permit please feel free to reach out to myself, or James if they are modeling related.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Monday, September 28, 2020 11:38 AM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Andrea,

I believe the bulk of your answers can be found in AGDC's body of application materials, though the following (as I recall it) might help unpack and hone-in on some of your technical questions.

AGDC provided an ambient demonstration for what they call "normal operations". The equipment/processes observed in AGDC's "normal operations" scenario are reflected in their AERMOD and more distant CALPUFF analyses. Very broadly, the scenario entails an operational Liquefaction Plant and Marine Terminal with an emissions profile that I would generally characterize as steady-state. AGDC provides a discussion of this modeled scenario and its formative assumptions in Section 4.1.1 of their Modeling Report, available as Appendix D to Resource Report 9. Alongside 'normal' facility emissions, including those from the compression and power generation turbines, both the elevated low-pressure flare and two of the three ground flares were conservatively modeled in this scenario by contemporaneously emitting under their respective pilot/purge and maximum relief rates. A conservative estimate of shoreline fumigation impacts and marine operations is also included in the "normal operations" scenario as I recall.

Beyond the former, AGDC considered a number of other scenarios that they did not model such as construction, start-up, early plant and marine terminal operations, maintenance, and seasonal impacts (on the turbines). They discuss these scenarios in Sections 4.1.2 and 4.1.3 of the aforementioned report. The discussions indicate that the "normal operations" scenario is the most conservative for the purposes of AGDC's ambient demonstration; this appears to be defensible through a combination of analytical, empirical, and practical factors of influence beyond the scope of technical discussion. Language throughout these sections broach the non-contemporaneous operation of select units, e.g. turbines and/or intermittent reciprocating equipment, in certain situations. This language, aided by a myriad of assumptions drawn from the larger body of application materials, is presented in sufficient detail to craft alternative modeling scenarios as warranted. To address the theme of your technical questions, as I understand them, the non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating equipment/processes of significance. By inspection, the "normal operations" scenario appears to offer a more conservative characterization of facility impacts within both the near- and far-field domain, *ceteris paribus*.

I am directing your technical question about flaring PTE to Dave since he had more day-to-day

experience in reviewing the application materials for annual emissions potential and BACT – as compared to my modeling-centric review. Regarding a facility diagram, there are a number of (annotated) hybrid satellite and process diagrams throughout the application materials; there are also discussions germane to how equipment/processes work (or don't work) together. In the absence of a specific diagram to cite, I would generally suggest a review of the various figures and discussions contained in AGDC's application materials, notably those in their general information and modeling attachments, to help locate something specific. FLM stakeholders should still have these materials from a few years ago, but let us know if anything appears to be missing. Best,

James

From: Stacy, Andrea <Andrea_Stacy@nps.gov>

Sent: Friday, September 25, 2020 3:40 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

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3. Is there a facility diagram that you could share with us?

Thanks!

-Andrea

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Sent: Thursday, September 24, 2020 1:53 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Subject: FW: [EXTERNAL] RE: Alaska LNG

FWD for you.

From: Renovatio, James J (DEC)
Sent: Wednesday, September 23, 2020 6:57 AM
To: Catherine Collins <Catherine_Collins@fws.gov>
Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

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AGDC modeled the proposed low-pressure flare with an elevated release height of just under 65 meters. They modeled their proposed ground flares with release heights of about two meters each as I recall. It is worth noting that there is an assumed/modeled base elevation of about 40 meters in all cases. AGDC indicated that these modeled release heights are 'effective' heights (due to plume dynamics) for their flares, which they developed using Department guidance; I believe this refers to our Modeling Review Procedures Manual. The 'as-designed' release heights for the flares are specified in their application materials and appear to be close to what was modeled – about 60 and 0 meters, respectively.

Regarding operation, the flares are assumed to operate more-or-less continuously under a low-level pilot/purge operating regime. Given the nature of the equipment, however, infrequent or episodic relief/upset regimes are also assumed. For the low-pressure elevated flare, relief/upset operation is assumed at 144 hours/year; for the ground flares, this regime is assumed at 500 hours/year. Both pilot/purge and relief/upset operation are contemporaneously and conservatively reflected in AGDC's modeling.

To help you refine your assumptions, the three ground flares will consist of pairs of wet/dry flares (six releases total). Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints. AGDC indicates that their ambient demonstration is characterized by emissions from the dry ground flares alone, which generally would be the more conservative case for ambient impacts. They also indicate that the flares are rated as smokeless in design if you are referencing AP-42 factors in your assessment(s). Each ground flare is specified as capable of handling half of the facility's maximum flaring need. This means only two would theoretically operate at the same time - one would be redundant.

It is worth noting that even with 24-hours of maximum relief impacts from the ground flares, buoyant plume notwithstanding, impacts of significance at or around Tuxedni, the nearest Class I area, are unlikely at 86 kilometers distant; I would, however, anticipate elevated gaseous impacts in the near-field though. As a practical matter, other high-emission units (such as the turbines) would not be operating – some or all – during facility upset or maintenance operations that necessitate maximum flaring regimes. In this regard, AGDC's ambient demonstration is somewhat conservative. For your reference, results of their VISCREEN and CALPUFF modeling efforts (w.r.t. impacts in and near Class I and Class II sensitive) are summarized in Appendix D to Resource Report 9 (there is overlap in the NEPA and PSD app, but the relevant content is the same).

That being said, the Permits team welcomes input from FLM stakeholders. Let me know if you have any additional technical questions. Best,

James

From: Collins, Catherine <Catherine_Collins@fws.gov>

Sent: Tuesday, September 22, 2020 2:55 PM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: Re: [EXTERNAL] RE: Alaska LNG

Hi Dave,

Just a couple of quick questions. In the modeling inputs the stack heights for the flares was set at 2 m. Is that correct. I would expect the flare stacks to be taller. Also do you know how the max situation for the flares. Would they all be running at one time and how long would they run for?

That will help us put it into the modeling run that we are doing. Tim and I have been working with the emissions and model and should have an answer for normal operations by the morning. We just want to figure out a good estimate for the max 24 hour to see if that makes any difference.

Thanks for your help.

-- Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax

Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Tuesday, September 22, 2020 12:46 PM
To: Collins, Catherine <Catherine_Collins@fws.gov>
Subject: [EXTERNAL] RE: Alaska LNG

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Here you go Catherine.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Collins, Catherine <Catherine_Collins@fws.gov>
Sent: Tuesday, September 22, 2020 7:34 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Alaska LNG

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,
Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807

303-969-5444 fax

Catherine_Collins@fws.gov

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#); [Renovatio, James J \(DEC\)](#)
Cc: [Shepherd, Don](#); [King, Kirsten L](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Collins, Catherine](#); [Allen, Tim](#); [Simpson, Aaron J \(DEC\)](#)
Subject: RE: [EXTERNAL] RE: Alaska LNG
Date: Wednesday, September 30, 2020 12:00:21 PM
Attachments: [2012-03-12-Title-V-Permit-of-U.-S.-Steel-Clairton-Works.pdf](#)

Thanks Dave,

I did see that map in RR1, but I'm actually looking for process flow diagrams. As an example, I've attached a T5 permit for a coke oven facility in PA. The permit contains process flow diagrams beginning on pdf page 9. I'm looking for something like this. (And, it is entirely possible this information is somewhere in the reams of resource reports submitted during the FERC process, I just can't find it!) Thanks!

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Wednesday, September 30, 2020 12:23 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Andrea,

Before I send out the email to AGDC asking for a process block diagram, I wanted to check and see if the one provided in Figure 1.3.1-2 (PDF pg 94) of 02_General Project Info_Resource Report 1.pdf (attached) is sufficient, or if you are looking for a more in depth diagram?

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Stacy, Andrea <Andrea_Stacy@nps.gov>
Sent: Wednesday, September 30, 2020 9:27 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine

<Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC)
<aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Thanks Dave. I appreciate the response, this provides clarity. We will stay tuned for AGDC's reply.

-Andrea

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Wednesday, September 30, 2020 11:19 AM

To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Renovatio, James J (DEC)
<james.renovatio@alaska.gov>

Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC)
<aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Andrea,

Regarding your initial Annual Facility Wide Emissions question: You are correct in your interpretation that there is nothing in the permit that would prevent AGDC from operating each of the six ground flares at the facility for 500 non-emergency hours per year. PTE was calculated with only four of the ground flares operating at 500 hours per year because only four would be needed to operate at any given time to handle the full capacity of gas that could be flared at the facility in a worse case scenario. This is an oversight on the Department's end. I recommend that the NPS comment on this and we will correct it during the response to comments period. I have already brought this up with Lisa Haas at AGDC and let them know that we will need to implement a total non-emergency gas throughput limit on the flares or will need to increase PTE to rectify this issue.

Regarding your Short-term Emissions question: I am going to reach out to Lisa Haas and request a process flow diagram for the facility.

Regarding your Flares + Turbines question: AGDC modeled a worst case scenario with the flares and turbines operating simultaneously, so we are unsure which less conservative actual scenarios would be likely. I will also pass this question along to Lisa Haas for guidance.

I will cc you and everyone else in this email when I reach out to Lisa Haas.

If you have any other questions please do not hesitate to contact me.

Regards,

Dave Jones

Env. Engineering Assistant II

ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Stacy, Andrea <Andrea_Stacy@nps.gov>
Sent: Monday, September 28, 2020 3:53 PM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Thanks Dave,

That is helpful – I couldn't reconcile the annual estimated PTE reported in the TAR (not in the permit) with the unit-by-unit permit limits, so that answers my question. I want to restate my understanding of your responses (to ensure I don't mischaracterize what ADEC has conveyed thus far), and ask a few follow-up questions, which are all summarized below.

Annual Facility-wide Emissions:

On an *annual* basis, there is nothing in the permit that would prevent them from operating each of the wet and dry flares for up to the 500 hours/year. This affects the estimated *annual* PTE, and as specified in the TAR, and excludes any emergency flaring for upset conditions, for which there are no annual or short-term limits. Therefore, the "maximum" flaring emissions for up to 500 hours per year are part of routine maintenance operations at the facility, and based on the permit, the allowable 500 hours of operation (again, non-emergency) *could occur at each of the flares* annually. Is this correct?

Short-term Emissions:

As to the short-term emissions question, based on James' email & the TAR, the wet and dry flares are unlikely to operate simultaneously: "Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints." This is partly why I was requesting a facility process block diagram . . . it would be helpful in understanding what processes/units are connected. As to the diagrams, I saw maps of the facility layout in the resource report materials previously submitted, but I have not located (or relocated) a block diagram of facility processes – maybe you could help me refresh my memory as to where to find one if available?

Furthermore, the 3rd flare is redundant. On a short term basis, only two of the flares would be operating in any given hour, as two flares can handle the entire facility capacity.

Flares + Turbines:

James also notes: "The non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating

equipment/processes of significance.” Meaning some of the turbines, but possibly not all of the turbines would be shut down during routine flaring operations. Again, there are no limits in the permit defining when the flares can operate and what other equipment can operate when the flares are in use. Given this, we have several follow-up questions related to realistic scenarios for simultaneous operation because as was noted, this was not modeled by AGDC:

1. Power turbines: We assume power generation would be necessary for facility operations at all times, even when the flares are in use. Is this correct, would the power turbines continue to operate when the flares are operating and if so how many? Possibly all four?
2. Compressor turbines: There are two compression turbines per train. What trains/flares combinations are likely to occur simultaneously during the maximum 24-hour period (e.g. 2 trains + 1 dry flare or 2 dry flares + 2 trains)? Again, we are looking for the maximum possible hourly combinations – we don’t need all of the possible permutations.

Thanks, we appreciate your help!

-Andrea

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Monday, September 28, 2020 2:12 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>

Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Andrea,

Regarding question No. 2 on flaring PTE:

It is true that the 6 ground flares (EUs 14 -19) operating at 500 hours/year would exceed the PTE for the whole facility. The reason that PTE for the facility is lower is because we assumed that only two of the dry flares and two of the wet flares would be operating at maximum capacity at any given time at full bore (55.2 MMscfh for each dry flare and 12.9 MMscfh for each wet flare) because they are each designed to handle 50% of the facility flaring requirements (2.7 billion scf/day of feed gas). However, I did not convey this assumption properly in PTE Table 12 of the technical analysis report.

Regarding annual limits for the flares EUs 14-20:

Condition 17.2 of the preliminary permit limits the number of hours EUs 14 through 19 flare to no more than 500 hours each, and EU 20 flares to no more than 144 hours, during startup, shutdown, and maintenance events, in any 12 consecutive months. We did not limit the amount of time that flaring could take place during an emergency or process upset as the flares are considered a control device to prevent raw gas from being vented to the atmosphere in the event of an emergency.

If you have any other questions as you continue to review the preliminary permit please feel free to

reach out to myself, or James if they are modeling related.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Monday, September 28, 2020 11:38 AM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Andrea,

I believe the bulk of your answers can be found in AGDC's body of application materials, though the following (as I recall it) might help unpack and hone-in on some of your technical questions.

AGDC provided an ambient demonstration for what they call "normal operations". The equipment/processes observed in AGDC's "normal operations" scenario are reflected in their AERMOD and more distant CALPUFF analyses. Very broadly, the scenario entails an operational Liquefaction Plant and Marine Terminal with an emissions profile that I would generally characterize as steady-state. AGDC provides a discussion of this modeled scenario and its formative assumptions in Section 4.1.1 of their Modeling Report, available as Appendix D to Resource Report 9. Alongside 'normal' facility emissions, including those from the compression and power generation turbines, both the elevated low-pressure flare and two of the three ground flares were conservatively modeled in this scenario by contemporaneously emitting under their respective pilot/purge and maximum relief rates. A conservative estimate of shoreline fumigation impacts and marine operations is also included in the "normal operations" scenario as I recall.

Beyond the former, AGDC considered a number of other scenarios that they did not model such as construction, start-up, early plant and marine terminal operations, maintenance, and seasonal impacts (on the turbines). They discuss these scenarios in Sections 4.1.2 and 4.1.3 of the aforementioned report. The discussions indicate that the "normal operations" scenario is the most conservative for the purposes of AGDC's ambient demonstration; this appears to be defensible through a combination of analytical, empirical, and practical factors of influence beyond the scope of technical discussion. Language throughout these sections broach the non-contemporaneous operation of select units, e.g. turbines and/or intermittent reciprocating equipment, in certain

situations. This language, aided by a myriad of assumptions drawn from the larger body of application materials, is presented in sufficient detail to craft alternative modeling scenarios as warranted. To address the theme of your technical questions, as I understand them, the non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating equipment/processes of significance. By inspection, the “normal operations” scenario appears to offer a more conservative characterization of facility impacts within both the near- and far-field domain, *ceteris paribus*.

I am directing your technical question about flaring PTE to Dave since he had more day-to-day experience in reviewing the application materials for annual emissions potential and BACT – as compared to my modeling-centric review. Regarding a facility diagram, there are a number of (annotated) hybrid satellite and process diagrams throughout the application materials; there are also discussions germane to how equipment/processes work (or don’t work) together. In the absence of a specific diagram to cite, I would generally suggest a review of the various figures and discussions contained in AGDC’s application materials, notably those in their general information and modeling attachments, to help locate something specific. FLM stakeholders should still have these materials from a few years ago, but let us know if anything appears to be missing. Best,

James

From: Stacy, Andrea <Andrea_Stacy@nps.gov>

Sent: Friday, September 25, 2020 3:40 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Thanks James!

I have a couple of quick follow-up questions:

1. I want to clarify to make sure I understand one of your statements. You said “As a practical matter, other high-emission units (such as the turbines) would not be operating – **some or all** – during facility upset or maintenance operations that necessitate maximum flaring regimes.” Does this mean that whenever the flares are operating in this “maximum” scenario, none of the turbines will be operating? Is there a potential situation (startup, shutdown or maintenance of just one of the trains) that would result in some of the flares and some of the turbines/trains operating simultaneously? If so, what is the maximum (realistic) combination of flares/turbines? Did they provide SSSD or maintenance emission assumptions/scenarios?
2. It appears that if each of the flares were to operate at the maximum permitted level annually (@ 0.068 lb/MMBtu & 500 hrs/yr), the annual NOx emissions from the flares alone would exceed the estimated facility-wide PTE provided in the draft TAR (we note that there are no

annual limits included in the draft permit for any of the emission units). For example, if you look at the estimated annual emissions for each individual flare unit (EUs 14-19), the maximum annual emissions from just the flares (limited to 500 hrs/yr) exceed the reported facility-wide PTE reported at the bottom of table 12 and in table 10 of the TAR. Can you please clarify this?

3. Is there a facility diagram that you could share with us?

Thanks!

-Andrea

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Sent: Thursday, September 24, 2020 1:53 PM

To: Stacy, Andrea <Andrea_Stacy@nps.gov>

Subject: FW: [EXTERNAL] RE: Alaska LNG

FWD for you.

From: Renovatio, James J (DEC)

Sent: Wednesday, September 23, 2020 6:57 AM

To: Catherine Collins <Catherine_Collins@fws.gov>

Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Catherine,

Dave forwarded me your questions; here's some information that may help you and Tim in your current Liquefaction Facility modeling efforts.

AGDC modeled the proposed low-pressure flare with an elevated release height of just under 65 meters. They modeled their proposed ground flares with release heights of about two meters each as I recall. It is worth noting that there is an assumed/modeled base elevation of about 40 meters in all cases. AGDC indicated that these modeled release heights are 'effective' heights (due to plume dynamics) for their flares, which they developed using Department guidance; I believe this refers to our Modeling Review Procedures Manual. The 'as-designed' release heights for the flares are specified in their application materials and appear to be close to what was modeled – about 60 and 0 meters, respectively.

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To help you refine your assumptions, the three ground flares will consist of pairs of wet/dry flares (six releases total). Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints. AGDC indicates that their ambient demonstration is characterized by emissions from the dry ground flares alone, which generally would be the more conservative case for ambient impacts. They also indicate that the flares are rated as smokeless in design if you are referencing AP-42 factors in your assessment(s). Each ground flare is specified as capable of handling half of the facility's maximum flaring need. This means only two would theoretically operate at the same time - one would be redundant.

It is worth noting that even with 24-hours of maximum relief impacts from the ground flares, buoyant plume notwithstanding, impacts of significance at or around Tuxedni, the nearest Class I area, are unlikely at 86 kilometers distant; I would, however, anticipate elevated gaseous impacts in the near-field though. As a practical matter, other high-emission units (such as the turbines) would not be operating – some or all – during facility upset or maintenance operations that necessitate maximum flaring regimes. In this regard, AGDC's ambient demonstration is somewhat conservative. For your reference, results of their VISCREEN and CALPUFF modeling efforts (w.r.t. impacts in and near Class I and Class II sensitive) are summarized in Appendix D to Resource Report 9 (there is overlap in the NEPA and PSD app, but the relevant content is the same).

That being said, the Permits team welcomes input from FLM stakeholders. Let me know if you have any additional technical questions. Best,

James

From: Collins, Catherine <Catherine_Collins@fws.gov>

Sent: Tuesday, September 22, 2020 2:55 PM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: Re: [EXTERNAL] RE: Alaska LNG

Hi Dave,

Just a couple of quick questions. In the modeling inputs the stack heights for the flares was set at 2 m. Is that correct. I would expect the flare stacks to be taller. Also do you know how the max situation for the flares. Would they all be running at one time and how long would they run for?

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Thanks for your help.

-- Catherine

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Environmental Engineer
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Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Tuesday, September 22, 2020 12:46 PM
To: Collins, Catherine <Catherine_Collins@fws.gov>
Subject: [EXTERNAL] RE: Alaska LNG

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Here you go Catherine.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Collins, Catherine <Catherine_Collins@fws.gov>
Sent: Tuesday, September 22, 2020 7:34 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Alaska LNG

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,

Catherine

Catherine Collins

Environmental Engineer

Branch of Air and Water Resources

7333 W. Jefferson Ave, Suite 375

Lakewood, CO 80235

303-914-3807

303-969-5444 fax

Catherine_Collins@fws.gov

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#); [Renovatio, James J \(DEC\)](#)
Cc: [Shepherd, Don](#); [King, Kirsten L](#); [Blakesley, Andrea J](#); [Paul Burger](#); [Collins, Catherine](#); [Allen, Tim](#); [Simpson, Aaron J \(DEC\)](#)
Subject: RE: [EXTERNAL] RE: Alaska LNG
Date: Wednesday, September 30, 2020 9:27:27 AM

Thanks Dave. I appreciate the response, this provides clarity. We will stay tuned for AGDC's reply.

-Andrea

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Wednesday, September 30, 2020 11:19 AM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>
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Andrea,

Regarding your initial Annual Facility Wide Emissions question: You are correct in your interpretation that there is nothing in the permit that would prevent AGDC from operating each of the six ground flares at the facility for 500 non-emergency hours per year. PTE was calculated with only four of the ground flares operating at 500 hours per year because only four would be needed to operate at any given time to handle the full capacity of gas that could be flared at the facility in a worse case scenario. This is an oversight on the Department's end. I recommend that the NPS comment on this and we will correct it during the response to comments period. I have already brought this up with Lisa Haas at AGDC and let them know that we will need to implement a total non-emergency gas throughput limit on the flares or will need to increase PTE to rectify this issue.

Regarding your Short-term Emissions question: I am going to reach out to Lisa Haas and request a process flow diagram for the facility.

Regarding your Flares + Turbines question: AGDC modeled a worst case scenario with the flares and turbines operating simultaneously, so we are unsure which less conservative actual scenarios would be likely. I will also pass this question along to Lisa Haas for guidance.

I will cc you and everyone else in this email when I reach out to Lisa Haas.

If you have any other questions please do not hesitate to contact me.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Stacy, Andrea <Andrea_Stacy@nps.gov>

Sent: Monday, September 28, 2020 3:53 PM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

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Annual Facility-wide Emissions:

On an *annual* basis, there is nothing in the permit that would prevent them from operating each of the wet and dry flares for up to the 500 hours/year. This affects the estimated *annual* PTE, and as specified in the TAR, and excludes any emergency flaring for upset conditions, for which there are no annual or short-term limits. Therefore, the "maximum" flaring emissions for up to 500 hours per year are part of routine maintenance operations at the facility, and based on the permit, the allowable 500 hours of operation (again, non-emergency) *could occur at each of the flares* annually. Is this correct?

Short-term Emissions:

As to the short-term emissions question, based on James' email & the TAR, the wet and dry flares are unlikely to operate simultaneously: "Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints." This is partly why I was requesting a facility process block diagram . . . it would be helpful in understanding what processes/units are connected. As to the diagrams, I saw maps of the facility layout in the resource report materials previously submitted, but I have not located (or relocated) a block diagram of facility processes – maybe you could help me refresh my memory as to where to find one if available?

Furthermore, the 3rd flare is redundant. On a short term basis, only two of the flares would be operating in any given hour, as two flares can handle the entire facility capacity.

Flares + Turbines:

James also notes: “The non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating equipment/processes of significance.” Meaning some of the turbines, but possibly not all of the turbines would be shut down during routine flaring operations. Again, there are no limits in the permit defining when the flares can operate and what other equipment can operate when the flares are in use. Given this, we have several follow-up questions related to realistic scenarios for simultaneous operation because as was noted, this was not modeled by AGDC:

1. Power turbines: We assume power generation would be necessary for facility operations at all times, even when the flares are in use. Is this correct, would the power turbines continue to operate when the flares are operating and if so how many? Possibly all four?
2. Compressor turbines: There are two compression turbines per train. What trains/flares combinations are likely to occur simultaneously during the maximum 24-hour period (e.g. 2 trains + 1 dry flare or 2 dry flares + 2 trains)? Again, we are looking for the maximum possible hourly combinations – we don’t need all of the possible permutations.

Thanks, we appreciate your help!

-Andrea

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Monday, September 28, 2020 2:12 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>

Cc: Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Burger, Paul A <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Andrea,

Regarding question No. 2 on flaring PTE:

It is true that the 6 ground flares (EUs 14 -19) operating at 500 hours/year would exceed the PTE for the whole facility. The reason that PTE for the facility is lower is because we assumed that only two of the dry flares and two of the wet flares would be operating at maximum capacity at any given time at full bore (55.2 MMscfh for each dry flare and 12.9 MMscfh for each wet flare) because they are each designed to handle 50% of the facility flaring requirements (2.7 billion scf/day of feed gas). However, I did not convey this assumption properly in PTE Table 12 of the technical analysis report.

Regarding annual limits for the flares EUs 14-20:

Condition 17.2 of the preliminary permit limits the number of hours EUs 14 through 19 flare to no more than 500 hours each, and EU 20 flares to no more than 144 hours, during startup, shutdown, and maintenance events, in any 12 consecutive months. We did not limit the amount of time that flaring could take place during an emergency or process upset as the flares are considered a control

device to prevent raw gas from being vented to the atmosphere in the event of an emergency.

If you have any other questions as you continue to review the preliminary permit please feel free to reach out to myself, or James if they are modeling related.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>
Sent: Monday, September 28, 2020 11:38 AM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>
Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Andrea,

I believe the bulk of your answers can be found in AGDC's body of application materials, though the following (as I recall it) might help unpack and hone-in on some of your technical questions.

AGDC provided an ambient demonstration for what they call "normal operations". The equipment/processes observed in AGDC's "normal operations" scenario are reflected in their AERMOD and more distant CALPUFF analyses. Very broadly, the scenario entails an operational Liquefaction Plant and Marine Terminal with an emissions profile that I would generally characterize as steady-state. AGDC provides a discussion of this modeled scenario and its formative assumptions in Section 4.1.1 of their Modeling Report, available as Appendix D to Resource Report 9. Alongside 'normal' facility emissions, including those from the compression and power generation turbines, both the elevated low-pressure flare and two of the three ground flares were conservatively modeled in this scenario by contemporaneously emitting under their respective pilot/purge and maximum relief rates. A conservative estimate of shoreline fumigation impacts and marine operations is also included in the "normal operations" scenario as I recall.

Beyond the former, AGDC considered a number of other scenarios that they did not model such as construction, start-up, early plant and marine terminal operations, maintenance, and seasonal impacts (on the turbines). They discuss these scenarios in Sections 4.1.2 and 4.1.3 of the aforementioned report. The discussions indicate that the "normal operations" scenario is the most conservative for the purposes of AGDC's ambient demonstration; this appears to be defensible

through a combination of analytical, empirical, and practical factors of influence beyond the scope of technical discussion. Language throughout these sections broach the non-contemporaneous operation of select units, e.g. turbines and/or intermittent reciprocating equipment, in certain situations. This language, aided by a myriad of assumptions drawn from the larger body of application materials, is presented in sufficient detail to craft alternative modeling scenarios as warranted. To address the theme of your technical questions, as I understand them, the non-modeled situations where flaring impacts are at their greatest will typically be seen during times that entail the shutdown of various emissions generating equipment/processes of significance. By inspection, the “normal operations” scenario appears to offer a more conservative characterization of facility impacts within both the near- and far-field domain, *ceteris paribus*.

I am directing your technical question about flaring PTE to Dave since he had more day-to-day experience in reviewing the application materials for annual emissions potential and BACT – as compared to my modeling-centric review. Regarding a facility diagram, there are a number of (annotated) hybrid satellite and process diagrams throughout the application materials; there are also discussions germane to how equipment/processes work (or don’t work) together. In the absence of a specific diagram to cite, I would generally suggest a review of the various figures and discussions contained in AGDC’s application materials, notably those in their general information and modeling attachments, to help locate something specific. FLM stakeholders should still have these materials from a few years ago, but let us know if anything appears to be missing. Best,

James

From: Stacy, Andrea <Andrea_Stacy@nps.gov>

Sent: Friday, September 25, 2020 3:40 PM

To: Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Allen, Tim <tim_allen@fws.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Thanks James!

I have a couple of quick follow-up questions:

1. I want to clarify to make sure I understand one of your statements. You said “As a practical matter, other high-emission units (such as the turbines) would not be operating – ***some or all*** – during facility upset or maintenance operations that necessitate maximum flaring regimes.” Does this mean that whenever the flares are operating in this “maximum” scenario, none of the turbines will be operating? Is there a potential situation (startup, shutdown or maintenance of just one of the trains) that would result in some of the flares and some of the turbines/trains operating simultaneously? If so, what is the maximum (realistic) combination of flares/turbines? Did they provide SSSD or maintenance emission assumptions/scenarios?

2. It appears that if each of the flares were to operate at the maximum permitted level annually (@ 0.068 lb/MMBtu & 500 hrs/yr), the annual NOx emissions from the flares alone would exceed the estimated facility-wide PTE provided in the draft TAR (we note that there are no annual limits included in the draft permit for any of the emission units). For example, if you look at the estimated annual emissions for each individual flare unit (EUs 14-19), the maximum annual emissions from just the flares (limited to 500 hrs/yr) exceed the reported facility-wide PTE reported at the bottom of table 12 and in table 10 of the TAR. Can you please clarify this?
3. Is there a facility diagram that you could share with us?

Thanks!

-Andrea

From: Renovatio, James J (DEC) <james.renovatio@alaska.gov>

Sent: Thursday, September 24, 2020 1:53 PM

To: Stacy, Andrea <Andrea_Stacy@nps.gov>

Subject: FW: [EXTERNAL] RE: Alaska LNG

FWD for you.

From: Renovatio, James J (DEC)

Sent: Wednesday, September 23, 2020 6:57 AM

To: Catherine Collins <Catherine_Collins@fws.gov>

Cc: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: RE: [EXTERNAL] RE: Alaska LNG

Hi Catherine,

Dave forwarded me your questions; here's some information that may help you and Tim in your current Liquefaction Facility modeling efforts.

AGDC modeled the proposed low-pressure flare with an elevated release height of just under 65 meters. They modeled their proposed ground flares with release heights of about two meters each as I recall. It is worth noting that there is an assumed/modeled base elevation of about 40 meters in all cases. AGDC indicated that these modeled release heights are 'effective' heights (due to plume dynamics) for their flares, which they developed using Department guidance; I believe this refers to our Modeling Review Procedures Manual. The 'as-designed' release heights for the flares are specified in their application materials and appear to be close to what was modeled – about 60 and 0 meters, respectively.

Regarding operation, the flares are assumed to operate more-or-less continuously under a low-level pilot/purge operating regime. Given the nature of the equipment, however, infrequent or episodic relief/upset regimes are also assumed. For the low-pressure elevated flare, relief/upset operation is

assumed at 144 hours/year; for the ground flares, this regime is assumed at 500 hours/year. Both pilot/purge and relief/upset operation are contemporaneously and conservatively reflected in AGDC's modeling.

To help you refine your assumptions, the three ground flares will consist of pairs of wet/dry flares (six releases total). Among these three ground flare pairs, only the dry or wet flare would operate at any given time given design and process constraints. AGDC indicates that their ambient demonstration is characterized by emissions from the dry ground flares alone, which generally would be the more conservative case for ambient impacts. They also indicate that the flares are rated as smokeless in design if you are referencing AP-42 factors in your assessment(s). Each ground flare is specified as capable of handling half of the facility's maximum flaring need. This means only two would theoretically operate at the same time - one would be redundant.

It is worth noting that even with 24-hours of maximum relief impacts from the ground flares, buoyant plume notwithstanding, impacts of significance at or around Tuxedni, the nearest Class I area, are unlikely at 86 kilometers distant; I would, however, anticipate elevated gaseous impacts in the near-field though. As a practical matter, other high-emission units (such as the turbines) would not be operating – some or all – during facility upset or maintenance operations that necessitate maximum flaring regimes. In this regard, AGDC's ambient demonstration is somewhat conservative. For your reference, results of their VISCREEN and CALPUFF modeling efforts (w.r.t. impacts in and near Class I and Class II sensitive) are summarized in Appendix D to Resource Report 9 (there is overlap in the NEPA and PSD app, but the relevant content is the same).

That being said, the Permits team welcomes input from FLM stakeholders. Let me know if you have any additional technical questions. Best,

James

From: Collins, Catherine <Catherine_Collins@fws.gov>

Sent: Tuesday, September 22, 2020 2:55 PM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Subject: Re: [EXTERNAL] RE: Alaska LNG

Hi Dave,

Just a couple of quick questions. In the modeling inputs the stack heights for the flares was set at 2 m. Is that correct. I would expect the flare stacks to be taller. Also do you know how the max situation for the flares. Would they all be running at one time and how long would they run for?

That will help us put it into the modeling run that we are doing. Tim and I have been working with the emissions and model and should have an answer for normal operations by the morning. We just want to figure out a good estimate for the max 24 hour to see if that makes any difference.

Thanks for your help.

-- Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Tuesday, September 22, 2020 12:46 PM
To: Collins, Catherine <Catherine_Collins@fws.gov>
Subject: [EXTERNAL] RE: Alaska LNG

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Here you go Catherine.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Collins, Catherine <Catherine_Collins@fws.gov>
Sent: Tuesday, September 22, 2020 7:34 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Subject: Alaska LNG

Hi Dave,

Could you please send Appendix 11 of the Alaska LNG Permit?

Thanks,
Catherine

Catherine Collins
Environmental Engineer
Branch of Air and Water Resources
7333 W. Jefferson Ave, Suite 375
Lakewood, CO 80235
303-914-3807
303-969-5444 fax
Catherine_Collins@fws.gov

From: [Stacy, Andrea](#)
To: [Jones, Dave F \(DEC\)](#)
Cc: [Paul Burger](#); [Blakesley, Andrea J](#); [Shepherd, Don](#); [King, Kirsten L](#); [Collins, Catherine](#); [Peters, Melanie](#); [Simpson, Aaron J \(DEC\)](#); [Plosay, James R \(DEC\)](#)
Subject: RE: [EXTERNAL] RE: NOx BACT questions for ADEC
Date: Thursday, October 29, 2020 6:51:32 AM

Thanks Dave. Just let us know.

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Wednesday, October 28, 2020 2:01 PM
To: Stacy, Andrea <Andrea_Stacy@nps.gov>
Cc: Burger, Paul A <Paul_Burger@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Peters, Melanie <Melanie_Peters@nps.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>
Subject: [EXTERNAL] RE: NOx BACT questions for ADEC

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Andrea,

Email received. I am in the process of looking over your comments and BACT cost spreadsheets and will formulate a response in the near future. It may make sense to set-up a follow-up meeting to discuss in detail if warranted.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

From: Stacy, Andrea <Andrea_Stacy@nps.gov>
Sent: Monday, October 26, 2020 8:06 PM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Cc: Paul Burger <Paul_Burger@nps.gov>; Blakesley, Andrea J <Andrea_Blakesley@nps.gov>; Shepherd, Don <Don_Shepherd@nps.gov>; King, Kirsten L <kirsten_king@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>; Peters, Melanie <Melanie_Peters@nps.gov>

Subject: NOx BACT questions for ADEC

Hi Dave,

Thank you for sending the pre-draft permit materials for the Agrium facility restart permit. We appreciate the communication regarding current permitting actions in Alaska, including the Agrium permit, as well as the AK LNG liquefaction facility permit. Because the AK LNG liquefaction facility (LF) is located adjacent to the Agrium plant, we are providing the attached documents to continue our dialog.

Our review of both permits is ongoing and we are preparing our responses, but to date, we have evaluated the technical accuracy of the BACT analyses and conclusions and have noted a significant discrepancy in the NOx BACT determinations for these sources.^[1] Considering the proximity and similarity of the emission units at these sources, why has ADEC concluded that SCR is economically feasible for the turbines at Agrium, but not at the AK LNG facility?

I am sharing our initial technical evaluation of the AK LNG NOx BACT analysis to aid in the discussion of this topic. We previously provided a technical evaluation of the Agrium BACT determination. While we agree with the determination that SCR is BACT, we continue to recommend that lower NOx emission limits are achievable for the Agrium emission units, as evidenced by the vendor quote obtained by AK LNG for their turbines. (I did not include our previous review of the Agrium BACT; please let me know if you would like me to resend it.)

The Agrium Solar turbines are much smaller units than the proposed turbines at the AK LNG liquefaction facility. In general, the “economy of scale” concept indicates that the smaller the unit, the lower the potential emissions reduction and the less cost-effective a measure becomes on a \$/ton basis. While we don’t have a cost evaluation for SCR on the Agrium turbines (a cost analysis is not required if a top-level control is selected), it is likely more expensive per ton of NOx removed to control the Agrium turbines than the AK LNG liquefaction facility turbines, calling AGDC’s economic feasibility determination into question.

We found several errors in AGDC’s BACT analysis and revised the analysis to correct these errors (attached). We understand that the Department also revised the AGDC analysis to update the bank prime interest rate and the PTE assumptions; however, we found additional assumptions that impact the direct annual costs. It also appears that in their 6th edition estimates, the applicant double counted some TCI fees by including CCM default calculations for line items that were also included in the vendor quote. All revisions to the cost analysis and the basis for our analysis assumptions are documented in the attached spreadsheets along with the “LF_ARD_analysis_assumptions_review_notes.docx” document. Our results indicate that SCR is much more cost-effective for the four power generation turbines and six compressor turbines at the LF facility than what AGDC’s analysis suggests.

Our estimates are summarized below, along with AGDC and ADEC reported results. (Note: The AGDC reported values are from the summary table on page 1 of the BACT information request response. The summary table values do not match the values reported in Appendix B – cost calculation spreadsheets, although they are close.)

- Liquefaction Facility Power Generation Turbines:
 - Our result – TCI based on EPA default method in the CCM, 7th edition: **\$5,873/ton** NOx removed (2019\$)
 - Our result –TCI based on revised vendor quote calculations: **\$6,041/ton** NOx removed (2019\$)
 - AGDC result: \$10,904/ton NOx removed (2017\$)

- ADEC result: \$9,878/ton NOx removed
- Liquefaction Facility Compression Turbines:
 - Our result – TCI based on EPA default method in the CCM, 7th edition: **\$4,319/ton** to **\$4,987/ton** NOx removed (2019\$) for an SCR inlet temperature of 730° F and 970° F, respectively.
 - Our result – TCI based on revised vendor quote TCI calculations: **\$4,383/ton** to **\$5,051/ton** NOx removed (2019\$) for an SCR inlet temperature of 730° F and 970° F, respectively.
 - AGDC result: \$11,241/ton NOx removed (2017\$)
 - ADEC result: \$10,519/ton NOx removed

The revised cost estimates, including some of ADEC's own revised estimates, are within the range of cost-effective thresholds established by other states for BACT determinations (and, in some cases, analysis of retrofits). In their recently released draft Regional Haze SIP, Texas identified a \$10,000/ton threshold for BACT determinations.

Our BACT review focused on the NOx emissions because as we have noted previously throughout the various permitting and approval processes for this project (i.e., FERC process), we are concerned about the potential nitrogen deposition impacts to Air Quality Related Values (AQRVs) in Denali National Park.

Feel free to give me a call if you have any questions.

Regards,

Andrea Stacy

From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>

Sent: Tuesday, October 13, 2020 4:55 PM

To: Dave Jordan <dave.jordan@erm.com>; Ted Hartman <Ted.Hartman@nutrien.com>

Cc: Frederick Werth <Frederick.Werth@nutrien.com>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>; Jack, Jesse R (DEC) <jesse.jack@alaska.gov>; Stacy, Andrea <Andrea_Stacy@nps.gov>; Collins, Catherine <Catherine_Collins@fws.gov>

Subject: [EXTERNAL] Draft Preliminary Construction Permit AQ0083CPT07 for Agrium's Kenai Nitrogen Facility

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Dave and Ted,

The Alaska Department of Environmental Conservation (Department) has reviewed the Construction Permit Application AQ0083CPT07 for Agrium's Kenai Nitrogen Operations facility and is providing

Nutrien with a copy of the draft permit, technical analysis report (TAR), and modeling report to review for technical accuracy. This is not a comment period, so please keep the scope of your comments to typographical and grammatical errors and correctness/completeness issues.

Note that the Department is concurrently sending the draft permit documents to the Federal Land Managers and EPA to begin their review and intends to public notice the preliminary permit on November 12, 2020 (30 days from today). Please review the permit, TAR, and modeling report and provide corrections to the Department by October 30, 2020, so that we have ample time to incorporate any suggested changes prior to the intended public notice date.

Regards,

Dave Jones

Env. Engineering Assistant II
ADEC – Air Quality – Juneau
dave.jones2@alaska.gov
907.465.5122

[1] A fundamental precept of BACT is that similar emission units in similar situations should have similar emission limits, unless it is demonstrated that there are significant differences; that demonstration has not been made.