

APPENDIX A – STATE TO STATE & SOURCE COMMUNICATIONS

NEIGHBORING STATES' COORDINATED EMISSIONS MANAGEMENT STRATEGIES EMAIL #1:

From: Henrikson, Craig

To: amber.potts@wyo.gov; leah.mckinley@wyo.gov; aislinn.johns@deq.idaho.gov; Pascale.Warren@deq.idaho.gov; carl.brown@deq.idaho.gov; pgen461@ECY.WA.GOV; allen.philip@deq.state.or.us; jeffrey.g.stocum@state.or.us; deStroh@nd.gov

Cc: Payne, Rhonda

Subject: Montana's Regional Haze Determination on Impact of Facilities On Montana's Class I Areas

Date: Friday, June 4, 2021 3:24:45 PM

Attachments: [Top Ten Idaho Only.xlsx](#)

[Top Ten North Dakota Only.xlsx](#)

[Top Ten Oregon Only.xlsx](#)

[Top Ten Washington Only.xlsx](#)

[Top Ten Wyoming Only.xlsx](#)

[Top Ten All States.xlsx](#)

Dear All,

In order to satisfy the Regional Haze requirements of 40 CFR 51.308 (f)(2)(ii) and 40 CFR 51.308(f)(3)(ii)(B) for state-to-state coordination, Montana is reaching out to neighboring states regarding their emission management strategies for sources affecting Montana Class I areas so that we may document those efforts in our SIP as supporting information. Montana also plans to reference the numerous meetings, calls and coordinated discussions through WRAP and other forums that have occurred as part of state Regional Haze SIP development.

Montana would also like to confirm (via documented correspondence) whether your state has reached any conclusions regarding specific facilities in Montana that may be impacting Class I areas within your state. More specifically, whether your state is recommending any additional controls for facilities located in Montana for the second round of Regional Haze planning. Montana reviewed the Rank Point/Weight Emissions Potential (WEP) and Area of Influence (AOI) results for each Class I area and focused on the top 10 facilities, whether in Montana or a nearby state, and made a determination regarding that specific facility's impact. This analysis took into consideration each facility's WEP/AOI ranking and any additional control analysis that was required to be completed for those facilities located in Montana.

For example, if a Montana four-factor source ranked high in the Rank Point file, and it was determined that no additional controls were needed for that facility, then the decision followed that facilities located in other states that were lower in ranking would not be recommended by Montana for additional controls. In the case of any out of state facilities that may be on the list, Montana will also give consideration for any four factor analyses that may have been conducted by that state specific to that facility. We have attached a sorted spreadsheet which just highlights facilities in your state which show up by Class I area on this Top Ten Facility list. Could you verify for those facilities whether a four-factor analysis was conducted for those

facilities for SO₄ and NO_x by filling in that detail on the spreadsheet and returning it? There is a spreadsheet for each state. We have also included the master spreadsheet in case you might find the additional information useful for your own SIP planning.

Montana modeled a long term strategy that included emissions reductions from large facility closures during this planning period. Based on the review of these modeled 2028 projections, source apportionment data, and taking into account emissions from prescribed fire and international emissions, Montana concluded that the emission reductions realized from requiring additional controls would not have a meaningful impact on the 2028 visibility projections. Therefore, Montana has determined that requiring additional controls this planning period is not reasonable. This determination will be revisited in the third planning period, as many control options proposed this round have not been sufficiently demonstrated in practice but will likely be in the next 10 years.

Would it be possible to review this information and populate whether a four factor analyses for the facilities in your state was completed; no later than June 14? And also include any statements you are able to make about any recommendations for Montana facilities which may be impacting a Class I area in your state?

Please let me know if you have any questions or feel free to reach out to Rhonda as well.

Thanks,
Craig Henrikson

EXAMPLE SOURCE SCREENING LETTER:

[DATE]

Sent electronically via email to: [EMAIL]

[ADDRESS]

RE: Regional Haze Source Screening Analysis

Dear [NAME]:

The Montana Department of Environmental Quality, Air Quality Bureau (AQB), is working on a State Implementation Plan (SIP) for the second planning period of the Regional Haze program, which is codified at 42 U.S. Code §7491 – *Visibility protection for Federal class I areas*. This planning period focuses on making reasonable progress toward national visibility goals.

As discussed during our phone conversation on [DATE], the AQB has completed an initial Regional Haze screening analysis of [SOURCE] and determined that the facility needs further review of process controls specifically related to [nitrogen oxides (NO_x) and/or sulfur dioxide (SO₂)].

Monitoring data indicate that sulfates and nitrates are the main contributors to anthropogenic haze in Montana. The primary precursors of nitrates and sulfates are emissions of NO_x and SO₂. The AQB based its initial analysis on the annual emission inventories submitted by [COMPANY] to the AQB for the years 2014-2017, which are compiled in Table 1 below. The initial screening analysis also considers the distance from the facility to the boundary of the nearest Federal class I area ([CLASS I AREA]). Taken together, emissions and distance provide a screening tool to identify facilities that may be contributing to haze and that therefore may require further analysis.

Table 1 – Facility-Level Emissions and Screening Analysis

Table 2 – Existing Process Controls

At this time, the AQB requests your review of the emissions and control equipment information the AQB has on file for the facility. Following this initial review, the AQB will be asking that you prepare a detailed review of additional process controls, specifically considering (1) the cost of control, (2) the time required to achieve control, (3) the energy and non-air quality environmental impacts of control, and (4) the remaining useful life of the source of emissions. The AQB will be contacting you shortly to schedule a call to discuss the initial screening analysis in more detail.

If you have any questions or concerns, please contact me by phone at [PHONE] or by email at [EMAIL].

Sincerely,

[NAME]

Air Quality Bureau

Cc: [FSS STAFF NAME], AQB

EXAMPLE REASONABLE PROGRESS GUIDANCE LETTER:

April XX, 2019

Sent electronically to: [EMAIL]

[ADDRESS BLOCK]

[ADDRESS BLOCK]

[ADDRESS BLOCK]

RE: Regional Haze Reasonable Progress Analysis

Dear [CONTACT NAME]:

As you are aware, the Montana Department of Environmental Quality, Air Quality Bureau (AQB), is in the process of developing a State Implementation Plan (SIP) for the second implementation period of the federal Regional Haze program, which is codified at 42 U.S. Code §7491 – Visibility protection for Federal class I areas. This implementation period focuses on making reasonable progress toward national visibility goals by analyzing progress to-date from the 2000-2004 baseline and considering whether additional emission reductions are necessary to continue a reasonable rate of progress.

The reasonable progress analysis involves assessing potential emission control technology against four statutory factors, including cost of controls, time necessary to install controls, energy and non-air quality impacts, and remaining useful life. Through this process, DEQ is also working with the Western Regional Air Partnership (WRAP) to prepare regional air quality modeling of visibility conditions associated with current emissions, projected future emissions, and potential future control scenarios. DEQ will work with you to ensure the accuracy and representativeness of emissions data for modeling.

Now that we have completed initial calls and discussed the screening process for [FACILITY NAME], DEQ is formally requesting assistance from [COMPANY NAME] in developing information for the reasonable progress analysis. In order for this information to be included in the regional modeling analyses, we request that it be submitted to DEQ no later than September 30, 2019.

The purpose of this letter is to provide additional clarification to help you prepare information associated with the reasonable progress analysis. We understand that confirming as many details as possible early in the analysis will reduce the chance of repeating or re-doing calculations later in the process. We hope these clarifications will help define the analysis, but please contact DEQ if you have any further questions.

In reviewing reasonable progress analyses, DEQ will rely on the following three resources to ensure accuracy and consistency. All information prepared as part of the reasonable progress analysis should be prepared using the guidance provided in these documents.

1. [EPA Draft Guidance on Progress Tracking Metrics, Long-term Strategies, Reasonable Progress Goals, and Other Requirements for Regional Haze State Implementation Plans for the Second Implementation Period \(“Draft Guidance”\)](#)ⁱ
2. [EPA Air Pollution Control Cost Manual \(“Control Cost Manual”\)](#)ⁱⁱ
3. [EPA Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze \(“Modeling Guidance”\)](#)ⁱⁱⁱ

Guidance for Developing Cost of Control Estimates for Reasonable Progress Analysis

For the purpose of the requested reasonable progress analysis, a 20-year planning horizon should be assumed. The only exception to this horizon is if there is a unit shutdown date identified that will cease operations before 20 years has expired. Additionally, the generally accepted accuracy in the Control Cost Manual is within plus or minus 30%. Facilities using technical experts and consultants may have more accurate projections due to their previous hands-on experience. DEQ requests that you please explain any deviations from the 20-year planning horizon or the presumed 30% accuracy in your estimates.

The latest guidance from EPA points to the interest rate that is most appropriate for your facility based on previous project engineering experience at your facility. This most likely will result in the selection of an interest rate between 3% and 7%. In the absence of a more specific interest rate, EPA recommends that you use the current bank prime rate, which is 5.5% as of the date of this letter, as a default.^{iv}

DEQ also requests that capital and annual costs be estimated as if the project will be constructed at the time the cost estimate is prepared. The annualized cost of the project should be presented by annualizing the capital cost and adding that to the annual operating costs. Please also calculate the cost in dollars per ton of emission reduction for each evaluated control alternative by dividing the uniform annual cost by the tons of annual emission reduction anticipated.

Additional Guidance for Preparing Reasonable Progress Analyses

As part of the reasonable progress analysis, DEQ will consider additional information provided by a facility, including supplemental visibility modeling. This modeling is not required. In lieu of supplemental visibility modeling, DEQ will use the information provided by WRAP to assess visibility impacts from a facility. Please note, a visibility modeling demonstration can support but not replace the four-factor analysis described in this letter. If you choose to prepare your own modeling demonstration, DEQ requests that it be prepared in accordance with EPA’s modeling guidance cited above and [Appendix W](#) to Title 40, Part 51 of the Code of Federal Regulations.^v DEQ also requests the opportunity to review your modeling protocol to ensure consistency with EPA guidance.

Thank you in advance for your support in this analysis effort. Again, please submit any reasonable progress analysis information by September 30, 2019. We are working closely to meet regional timelines for visibility modeling and this due date will allow adequate time for review and discussion of the analysis in advance of regional deadlines. If you have any questions, please contact [Rhonda Payne/Craig Henrikson](#) at 406-444-1472 or by email at [EMAIL](#).

Sincerely,

Rebecca Harbage
Regional Haze Project Manager
Air Quality Bureau

Cc: [Craig/Rhonda], AQB
[INSPECTOR NAME], AQB
David L. Klemp, Chief, AQB

EXAMPLE REPRESENTATIVE BASELINE EMISSIONS EMAIL REQUEST:

From: Payne, Rhonda
To: Peterson, Todd
Subject: FW: Regional Haze Baseline Emissions Request
Date: Tuesday, May 28, 2019 2:26:00 PM

Hello Todd,

Thank you for the work you have conducted thus far toward submitting the requested Four Factor Analysis. As you are aware, Montana used an average of your facility's 2014-2017 emissions as a screening mechanism to determine if the facility would be required to perform a Four Factor Analysis. We are now seeking your input regarding emission scenarios to be used in regional modeling demonstrations. Over the next six months, DEQ will be working closely with the Western Regional Air Partnership (WRAP) to provide emissions information for several modeling demonstrations. These demonstrations include:

1. A "representative baseline" scenario,
2. A future year "2028 on the books/on the way (2028 OTB/OTW)" scenario, and
3. A future year "2028 controls" scenario.

The "representative baseline" scenario will be based on emissions information that is representative of the current level of emissions from normal operations at the facility today. Representative baseline emissions must be confirmed now so that this modeling demonstration can be conducted in June 2019.

Future year emission scenarios will be built using the "representative baseline" scenario as a starting point. These future year scenarios include the "2028 OTB/OTW" scenario, which will incorporate any changes in emissions between the baseline (now) and 2028 that are expected to result from rules and regulations already adopted or anticipated. Modeling for this scenario will be conducted in August 2019. The second future year emission scenario is the "2028 controls" scenario, which will incorporate reductions that result from any additional controls required as a result of the Four Factor Analysis. This round of modeling will be conducted in December 2019.

The purpose of this email is to confirm the representative baseline emissions for your facility that will be used for the June modeling effort. Having reviewed your recent annual emissions inventories, we are proposing to use an average of 2017-2018 as your representative baseline emissions. We need concurrence that this two-year period generally represents normal conditions at your facility currently. If you feel that the two-year period of 2017-2018 does not represent your baseline emissions, our second proposal is to use an average of 2014-2017, which would be identical to the data used in the Q/d analysis.

Please respond to this email to confirm whether the two-year average (2017-2018) or the four-year average (2014-2017) is more representative of your current baseline emissions (see below). **We request that you confirm this information no later than June 7, 2019.** Later this summer, we will be contacting you to share results from the baseline modeling and confirm future year emissions for the “2028 OTB/OTW” modeling scenario.

Below are the two “representative baseline” options that we propose you select from.

MDU – Lewis and Clark Station

4-year average (2014-2017) = 604.67 tpy NO_x, 447.60 tpy SO₂

2-year average (2017-2018) = 579.39 tpy NO_x, 22.55 tpy SO₂

Rhonda Payne

Montana DEQ – Air Quality Bureau

Permitting Services Section

Phone: 406.444.5287

Fax: 406.444.1499

EXAMPLE 2028 OTB/OTW EMISSIONS EMAIL

From: Payne, Rhonda

Bcc: "Tessa Damuth"; "Peterson, Todd"; Harbage, Rebecca; "Leu, Mitchell"; Paul W Liner; trevorkjensrud@stoltzelumber.com; "Ruth Jensen"

Subject: Regional Haze Clarification and Data Request

Date: Tuesday, July 09, 2019 3:21:00 PM

Thank you for confirming the representative baseline emissions for your facility. DEQ provided these emissions numbers to the regional modelers for use in the first phase of the Regional Haze modeling. As a reminder, three separate regional modeling scenarios will be analyzed over the next six months. These include:

1. A "representative baseline" scenario:

- Representing the current level of emissions from normal operations at the facility today. This baseline modeling will help us evaluate progress since initial implementation of the Regional Haze Rule. Modeling began in June 2019.

2. A future year 2028 on the books/on the way ("2028 OTB/OTW") scenario:

- Representing anticipated future emissions and incorporating any changes in emissions between the baseline and 2028 that are expected to result from non-Regional Haze rules and regulations already adopted or anticipated. Depending on your operations, this may or may not be different from your representative baseline emissions. Modeling will begin in August 2019.

3. A future year "2028 controls" scenario:

- Representing anticipated future emissions and incorporating any changes in emissions that may result from the addition of selected reasonable controls for Regional Haze. Modeling will begin in December 2019.

An important point to keep in mind is that, when analyzing potential improvements in visibility that may result from additional reasonable controls, DEQ will compare the two future year scenarios: 2028 OTB/OTW and 2028 controls. In other words, we will be looking at anticipated future year emissions if *no additional Regional Haze controls* are required and comparing them to future year emissions *with additional Regional Haze controls* to determine whether reasonable controls will be required. We hope you will clearly express this comparison as part of your four-factor analysis (still due no later than September 30, 2019). In short, please document how your future year emissions, as represented by the 2028 OTB/OTW scenario, would differ if the identified control options were implemented.

What this means is that planned emission changes at the facility that are unrelated to regional haze (for example, due to increased demand, change in operations, or other reason) between the baseline and 2028 will be accounted for in the 2028 OTB/OTW scenario, separate from the 2028 controls scenario. The possible impact of additional regional haze controls will be assessed in the context of the anticipated 2028 OTB/OTW scenario. For some facilities, 2028 OTB/OTW emissions may be equal to the representative baseline. For others with anticipated changes in production levels, it may be possible to estimate 2028 OTB/OTB emissions by

multiplying the current emission factor per production unit by the expected 2028 production level. Still others may wish to account for planned improvements that are expected to reduce the emission factor prior to 2028.

DEQ requests that you please submit your future year 2028 OTB/OTW emissions no later than August 1st. We strongly recommend that all assumptions and decision points regarding emission projections be well documented and justified in this submittal and match-up with your assumptions in your four-factor analysis. This is especially true if your 2028 OTB/OTW emissions differ from your previously-submitted representative baseline emissions. Please contact me directly with any questions.

Regards,

Rhonda Payne

Rhonda Payne

Montana DEQ – Air Quality Bureau
Permitting Services Section
Phone: 406.444.5287
Fax: 406.444.1499

APPENDIX B – MODELING DELAY INFORMATION

Via E-Mail

February 8, 2021

Mary Uhl
Executive Director
Western Air Resources Council (WESTAR)
3 Caliente Road #8
Santa Fe, New Mexico 87508
(505) 954-1160
maryuhl@westar.org

Subject: Explanations for Delay in Western States Regional Haze Modeling

Dear Mary:

This letter documents and provides reasons for delays in the chronology of Ramboll's completion and delivery of the Regional Haze (RH) photochemical modeling results since late 2018, for the western states on the WRAP Technical Support System (TSS). The TSS is our delivery target since western states and other WRAP partners use it for Round 2 RH State Implementation Plans (SIPs) due July 2021. This work for WESTAR-WRAP has been done mainly under WESTAR Contract 19-01. First and foremost, I want to emphasize how much we value WESTAR-WRAP membership and the western states in particular as important clients and these delays in no way indicate a lack of commitment by Ramboll or us not placing this work as highest priority. This is the most important project that I and my staff have right now, and we are trying to finish delivery of high quality RH technical work products as quickly as we can.

The WRAP western state RH CAMx source apportionment is quite complex and complicated integrating numerous sources of data (e.g., 2014NEI, WRAP states data, EPA 2016v1 platform, natural and international emissions, data products of WRAP workgroups and projects etc.), because the vast majority of emissions affecting RH planning are out of the control of the states, but must be thoroughly assessed with photochemical modeling per EPA RH planning guidance. The work tasks in Contract 19-01 involved a lot of moving parts and pieces of data that needed to be properly implemented presenting multiple opportunities for mistakes. However, that is not an excuse as Ramboll has a reputation and track record on performing such complicated and high-quality air quality modeling studies.

In my over 40 years as an air quality consultant, I have never had a project that had so many setbacks for so many different reasons. Ramboll is not blameless in this as some delays are our fault and we have taken a financial penalty by all the re-running of modeling scenarios, not to mention the emotional and stressful aspects of these delays. But many of the delays have been unique and due to unforeseen circumstances that were out of our control, including:

- Federal government shut-down in December 2018 and January 2019 delayed getting EPA's 2014 modeling platform at the outset of the project.

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www.ramboll.com

- EPA's 2014 GEOS-Chem simulation that we planned to use for Boundary Conditions (BCs) was flawed with June & July SO₂/SO₄ overestimation and year-round ozone overestimation. As a result, we had to conduct our own unplanned 2014 GEOS-Chem simulation to correct it that took several months.
- Delays and data processing decisions at EPA in releasing the National Emissions Inventory Collaborative (NEIC) 2016v1 modeling platform and 2023 and 2028 future year emission projections caused delays in getting future year emissions, as well as errors in the data, as noted below.
- Ramboll modeling computer servers for this work are located in northern California. The Pacific Gas & Electric utility instituted Public Service Power Shutoffs (PSPS) to prevent wildfires that shut down the power to the computers doing the modeling during portions of September-October 2019.
- In November 2019, California Air Resources Board discovered errors in the 2014v2/RepBase fugitive dust emissions they provided that caused delays while we re-processed the emissions and re-ran model simulations.
- COVID-19 Shelter-in-place from March 2020 to the present disrupted and slowed down the modeling. It took a while to figure out how to work effectively remotely. Also with no one in the office, when a computer goes down, hangs or there is a need to mount a new disk to make disk space, there are longer delays than normal as someone has to make a trip to the office.
- In June 2020 we found that some anthropogenic state-controllable sources for RH planning were both incorrect and/or double-counted in the NEIC 2016v1 modeling platform data, in both of the key scenarios for RH planning, the already-completed RepBase and 2028OTBa projection scenarios in the WESTAR-WRAP modeling effort, that caused a 3-month delay (Jun-Jul-Aug 2020). The emissions had to be reviewed by Ramboll and the states for corrections, updated and fixed and SMOKE emissions modeling of re-done so new RepBase2 and 2028OTBa2 could be done.
- Because of the problems and reprocessing required for the NEIC 2016v1 and 2028 emissions, technical decisions were made by WESTAR-WRAP members in RH work groups, to change some of the emissions sector datasets to be used in the new RepBase2 and 2028OTBa2 scenarios from what was in Ramboll's contract necessitating re-processing and some additional delays. The effect of these decisions was non-zero in terms of Ramboll effort, but were timely and improved the representativeness of the RepBase2 and 2028OTBa2 modeling results for RH planning.
- Unprecedented wildfires in Northern California August through November 2020 interfered with staff working as PM_{2.5} concentrations in excess of 200 µg/m³ blanketed the region making going outdoors and travel dangerous. Many staff were on-call prepared for evacuation and worked much less efficiently under stressful conditions.
- Coding errors in the Ramboll CAMx model caused two re-runs of the CAMx RepBase2 and 2028OTBa2 source apportionment simulations in late 2020. As these runs take ~28 days to run, each re-run can cause a 1-2 month delay as we have to debug what the error is, fix it and re-run.

Ramboll was originally teamed with a Subcontractor whose role was to do most of the SMOKE emissions modeling. The same Subcontractor had a similar role when Ramboll developed the WRAP WestJumpAQMS 2008 and IWDW-WAQS 2011 modeling platforms and performed well.

Attachment 1 has a chronology of events that occurred and caused delays in delivering products on schedule. Below we discuss how some of these specific events delayed some of the key project deliverables.

- The schedule for the first big deliverable was WRAP-WAQS Shake-Out 2014v1 CMAQ and CAMx platforms, model evaluation and Close-Out meeting by March 2019. The Close-Out meeting occurred in April 2019 and delivery of the 2014v1 platform to IWDW in May. The causes for these delays are as follows:
 - Initial contract award was received December 11, 2018, affecting the proposed schedule from Ramboll. If we have started December 1, 2018 as originally planned we likely would have noticed the missing files for EPA's 2014 platform on their ftp site before the unexpected government shut-down.
 - Federal government shut-down December 22, 2018 through January 25, 2019 that delayed getting the EPA 2014 modeling platform by over a month as the EPA ftp site did not include all of the files and EPA staff were unavailable to provide them.
 - In February 2019 we found that the EPA 2014 GEOS-Chem had overestimation issues and in March 2019 EPA re-ran June and July to fix one of the problems so that final 2014v1 CMAQ/CAMx simulations, MPE and database transfer were delayed from the March target timeframe until April-May 2019.
- The next big deliverables, as identified in the May 29, 2019 WESTAR 19-01 Amendment#2 (A2), was 2014v2 emissions modeling, 2014 GEOS-Chem modeling and 2014v2 CMAQ/CAMx modeling to be completed by July 2019 and Representative Baseline (RepBase) modeling to be completed by August 2019. In reality, the first CAMx 2014v2 simulation was not completed until September 2019 and a series of emission updates were made so that the final 2014v2 CAMx base case was not completed until early December 2019. The first RepBase run was not completed until January 2020. The reasons for the delays of the final 2014v2 and initial RepBase simulations are as follows:
 - The July 2019 deadline for the 2014v2 platform was probably overly ambitious, but August should have been doable.
 - A key update in the 2014v2 platform was 2014 emissions for California that CARB provided to the SMOKE emissions Subcontractor in May 2019. In July the Subcontractor started asking questions and needing updates to the 2014 California inventory, so it appears they sat on and didn't look at the data for two months. 2014v2 SMOKE emissions processing was delayed as the Subcontractor's SMOKE modeler had many trips, such as to Korea (June), South America (July) and the EPA Emissions Inventory Conference in Dallas (August). Ramboll finally received the disk drive with the 2014v2 emissions on August 29, 2019. Note that Ramboll has worked very well with this Subcontractor in past studies (e.g., 2008 and 2011 platforms), but personnel

changes appear to have affected their ability to deliver in a timely fashion. Ramboll ultimately took over the SMOKE emissions modeling so that it could be performed in a more timely manner.

- Ramboll's initial CAMx 2014v2 simulation in September 2019 produced high ozone in northeast Wyoming that was traced to an emissions modeling error that allocated all the annual average O&G emissions to January in some counties.
 - The Subcontractor corrected the 2014v2 O&G emissions and a revised CAMx 2014v2 simulation was conducted in October 2019.
 - The California Air Resources Board informed us in November 2019 that there were errors in California's 2014v2/RepBase fugitive dust emissions and sent corrections that were incorporated into the RepBase emissions delaying the RepBase CAMx simulation until January 2020.
 - Also in November 2019, we discovered errors in the RepBase fire emissions files provided by the WRAP Fire & Smoke Work Group (FSWG) contractor that produced negative PM_{2.5} emissions that had to be corrected by the FSWG contractor. Identification of these sort of issues for fire and many other source categories is a common and required task for assembly of air quality modeling scenarios in a platform. The evaluation and correction of the fire emissions files was another delay in the sequence to assemble RepBase.
 - Errors in EPA's proprietary and lightly documented AMET MPE Tool that EPA did not fix until January 2020 (and only EPA can fix), that we use to calculate performance statistics to be in compliance with EPA modeling guidance, meant that some of the model performance evaluation (MPE) products for the 2014v2 simulations were delayed.
- WESTAR Contract 19-01 Amendment#5 (A5) dated November 22, 2019 had several deliverables with the key ones as follows: (1) 2002 Dynamic Evaluation (2002DE) CAMx simulation completed by February 2020; (2) 2028OTB CAMx done by February 2020; and (3) CAMx 2028 source apportionment done by March 2020. There were numerous iterations in these simulations so that they were not finally completed until January 2021 for the following reasons:
 - After these milestones were set in the contract and in discussion with Regional Technical Operations Work Group Co-Chairs and WESTAR-WRAP staff and to meet objectives (e.g., obtain separate fire and U.S. anthropogenic emission contributions), the RepBase, 2028OTBa and 2002DE were turned into source apportionment simulations each of which takes ~28 days to run. Thus, the original schedule in A5 as the awarded contract required was physically impossible to meet given the changes in the run times from a CAMx standard model run (~5 days) to a source apportionment run (~28 days).
 - The delays in the 2014v2 and RepBase simulations meant that A5 modeling could not start until January 2020 instead of November 2019 as originally envisioned. This meant that the 2028OTB emissions and first CAMx 2028OTB simulations and visibility projections were completed in March-April instead of February 2020.

- In March 2020, shelter-in-place orders were mandated due to the COVID-19 pandemic that caused a slow-down in the modeling for several reasons:
 - People had to move their work stations from the office to home where they do not have as efficient a work space (e.g., copier machines, access to computers, etc.).
 - It took some time for people to figure out how to work from home effectively and efficiencies suffered.
 - Schools and day cares closed so parents had full time responsibility for their children and had to assist teaching from home.
 - When the high performance Linux computers in the office went down, hung or we needed to mount disks for backups to make more disk space, someone had to physically come in to the office and there were restrictions on how that could be done.
- The 2002 Dynamic Evaluation emissions development to backcast 2014 emissions to 2002 turned out to be a much bigger task than originally scoped by Ramboll and as awarded in the contract. It was deemed less critical than the 2028OTB modeling so was de-emphasized compared to getting the 2028 visibility projections done.
- How to treat fires in the 2028 MID projections caused some delays as there were modeled fires on some days in the IMPROVE MID; MID are selected in part to limit fire contributions.
- Double-counted and/or incorrect anthropogenic state-controllable sources for RH planning were discovered in the NEIC 2016v1 modeling platform due in part to EPA emissions processing of the 2016v1 files having O&G sources in the Non-EGU Point files instead of in the O&G files. Several WESTAR-WRAP region states also identified incorrect emissions rates in the 2016v1 files. This caused a series of state-by-state review and correction actions and a 3-4 month delay at a critical point in the regional haze modeling. This was probably the single biggest issue that caused delays in the project and required the following corrective action:
 - Ramboll conducts intensive review of the EPA 2016v1 platform emissions to identify the problems.
 - Western states review and update their RepBase and 2028OTBa emissions to now be RepBase2 and 2028OTBa2 inputs.
 - The WESTAR-WRAP project manager decides not to continue to use the NEIC 2028 projections for some source sectors (e.g., WRAP non-EGU Point), in response to requests from the WESTAR-WRAP region states, in 2028OTBa2 modeling and use 2014 instead.
 - Ramboll creates harmonized emission inventories for RepBase2 and 2028OTBa2 and conducts SMOKE modeling.
 - Re-run RepBase2 and 2028OTBa2 source apportionment simulations.

- WESTAR Contract 19-01 Amendment#10 (A10) provided funding for updating the RepBase2 and 2028OTBa2 emissions to address the EPA double counting issue and had a detailed schedule: (1) CAMx RepBase2 H-L SA run done by Nov 17, 2020; (2) CAMx 2028OTBa2 H-L SA run done by Nov 28, 2020; (3) CAMx 2028OTBa2 L-L SA run done by Dec 30, 2020. In reality, the final RepBase2 and 2028OTBa2 H-L SA runs were not done until January 2021 due to multiple re-runs:
 - The RepBase2 and 2028OTBa2 H-L SA simulations take approximately 28 days to run. The first RepBase2 and 2028OTBa2 H-L SA runs were completed within the A10 schedule (Nov 2020), but a series of issues were discovered that caused re-runs as follows:
 - The way lightning NOx emissions were treated was changed from millions of virtual point sources to a netCDF 3-D input to be more computationally efficient. However, a coding error in the CAMx v7.0 model caused the netCDF 3-D inputs not to work correctly and it adversely affected the source apportionment results necessitating going back to the virtual point source input approach.
 - The second round of RepBase2 H-L SA runs was performed in December 2020, but was invalid due to missing New Mexico Non-EGU Point emissions (Ramboll's fault).
 - A third set of RepBase2 and 2028OTBa2 simulations were conducted the end of December 2020 into January 2021 and another coding error was discovered in CAMx v7.0 that dropped point source SO2 emissions.
 - The fourth set of RepBase2 and 2028OTBa2 H-L SA simulations finished in late January 2021 and were post-processed and transferred to the TSS by end of January.

I hope you find this letter useful in helping to explain why the regional haze modeling for the WESTAR-WRAP region is delayed. I believe these issues are behind us and the regional haze modeling results are now being populated onto the WRAP TSS. I do not foresee any remaining modeling or data delivery issues for the remaining tasks over the next 2-3 months, and Ramboll is closely coordinating with WESTAR-WRAP staff and the RTOWG Co-Chairs.

If you need more information or want me to personally talk to EPA or any of the States with WESTAR-WRAP staff in attendance, please let me know as I am always available and always try to live up to my commitments and responsibilities.

Best Regards,

A handwritten signature in blue ink, appearing to read "Ralph E. Morris", with a stylized flourish at the end.

Ralph E. Morris
Managing Principal
Central West Business Unit (CA-UT-CO)
Ramboll Environment and Health
(415) 899-0708
rmorris@ramboll.com

cc. Tom Moore

Attachment 1. Timeline of events that caused delays in the WRAP western states regional haze modeling.

Approximate Date	Event
Dec 11, 2018	Initial WESTAR Contract 18-12 to development 2014 Shake-Out platform was received 10 days after project start date (Dec 1, 2018)
Dec 2018-Jan 2019	Federal government shut-down Dec 22, 2018 – Jan 25, 2019 caused over a month plus delay in getting all files from EPA's 2014 modeling platform as the 2014 platform files on the EPA ftp site were incomplete.
Feb 2019	Found that EPA's 2014 GEOS-Chem run that was planned to be used for BCs was flawed as it had too high SO ₂ /SO ₄ in Jun & Jul and overstated O ₃ year-round. This meant Ramboll had to perform an unplanned 2014 GEOS-Chem run that took several months to complete.
Mar 2019	EPA re-runs GEOS-Chem for Jun & Jul without volcano eruption fixing Jun & Jul SO ₂ /SO ₄ overestimation problem in BCs but causing delays in delivering the 2014v1 Shake-Out modeling platform in March 2019.
Jun – Aug 2019	2014v2 SMOKE emissions modeling delayed 3 months due to unavailability of Subcontractors SMOKE modeler.
Sep 2019	Corrections needed for error in SMOKE emissions modeling of 2014v2 (overstates Wyoming Jan O&G emissions) caused another month delay.
Sep – Oct 2019	PG&E Public Service Power Shutoffs (PSPS) cut-off power to Ramboll's Linux computers in their Novato, CA office shutting down progress on 2014v2, RepBase2 and 2028OTB modeling.
Nov 2019	California Air Resources Board informs us that California Fugitive Dust emissions are in error in 2014v2/RepBase and sends update that caused delays.
Nov 2019	The RepBase fires from the FSWG have errors that produce negative PM _{2.5} emission that need to be fixed
Dec 2019	EPA's AMET MPE tool does not work right and does not generate all the MPE products that are needed. EPA AMET contact goes on holiday and issue is not fixed until after they come back in Jan 2020.
Jan 2020	Modeling for 2028OTB and 2002DE that was supposed to start in November 2019 started in Jan 2020 instead due to delays and finishing up 2014v2 and RepBase modeling.
Mar 2020 – present	COVID-19 shelter-in-place disrupts modeling as people can no longer go to the office and must work from home. That reduces efficiency and modeling takes longer due to more computer down time.
Apr – May 2020	Extra time to determine how to treat modeled fires in visibility projections for the MID that are not supposed to have any episodic fire.
Jun – Sep 2020	Double counted sources in EPA's 2016v1 modeling platform caused a stop of the modeling and have Ramboll and the states re-work the emissions, fix them and redo the SMOKE modeling causing a 3-4 month delay.
Jun – Sep 2020	Given problems with EPA 2016v1 platform 2028 emission projections, WRAP decides to change what emissions are being used in 2028OTB emission scenarios from what was in Ramboll's contract.
Aug – Nov 2020	Massive wildfires in California caused extremely high PM _{2.5} concentrations, limited travel in the region and caused inefficiencies in work.
Nov 2020	RepBase2 and 2028OTBa2 H-L SA runs have to be re-done due to coding error in CAMx v7.0 treatment of netCDF 3-D lightning NO _x inputs.
Dec 2020	Second RepBase2 H-L SA run has to be re-done due to missing New Mexico non-EGU point source emissions.
Dec 2020 – Jan 2021	Third RepBase2 and 2028OTBa2 H-L SA runs have to be re-done due to coding error in source apportionment species mappings that dropped point source SO ₂ emissions.
Jan 2021	Fourth RepBase2 and 2028OTBa2 H-L SA runs have satisfied all the QA checks and appear correct so that 2028 visibility projections and other data will be transferred to the WRAP TSS by the end of January 2021.

APPENDIX C – SOURCE SCREENING LIST

MONTANA Q/D SOURCES SCREENED FOR REASONABLE PROGRESS ANALYSIS

Montana Permitted Stationary Sources with Q/d > 4 (where Q= Avg NOx + Avg SO2)											
AIRS_NUM #	BER	MAILING_COMPANY	FACILITY_NAME	PM10 Avg. 2014 - 2017	NOx Avg. 2014-2017	SO2 Avg. 2014-2017	VOC Avg. 2014-2017	2014-2017 Average Emissions NOx+SO2	Distance to CIA (km)	2014-2017 Q/D Q = NOx+SO2	
	087-0008	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #1-4	517.59	13,969.55	8,895.52	307.43	22,865.08	U.L. Bend	198.9	114.96
1	087-0008	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #4	197.61	4,149.53	2,327.78	115.01	6,477.31	U.L. Bend	198.9	32.57
2	087-0009	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #3	186.82	3,983.48	2,255.78	108.65	6,239.26	U.L. Bend	198.9	31.37
3	029-0008	WEYERHAEUSER NR - COLUMBIA FALLS	WEYERHAEUSER-CFALLS	202.78	969.60	14.77	561.65	984.36	Glacier	13.3	74.01
4	043-0001	ASH GROVE CEMENT COMPANY	ASH GROVE CEMENT	44.50	1,029.91	205.21	3.79	1,235.11	GATES	30.6	40.36
5	083-0003	MONTANA DAKOTA UTILITIES CO	MDU - LEWIS & CLARK STATION	64.01	604.67	447.60	5.36	1,052.28	Teddy Roosevelt	51.8	20.31
6	031-0005	OLDCASTLE MATERIAL CEMENT HOLDINGS, INC.	TRIDENT	135.67	1,473.87	14.52	0.37	1,488.39	Yellowstone	97.4	15.28
7	111-0023	YELLOWSTONE ENERGY LIMITED PARTNERSHIP	YELLOWSTONE POWER PLANT	19.83	404.32	1,732.01	11.00	2,136.33	Absaroka	143.8	14.86
8	063-0002	ROSEBURG FOREST PRODUCTS CO	ROSEBURG FOREST PRODUCTS	142.96	299.28	3.33	180.35	302.61	Selway Bitterroot	26.6	11.38
9	087-0007	COLSTRIP ENERGY LTD PARTNERSHIP	COLSTRIP ENERGY LTD PARTNERSHIP	23.01	811.68	1,123.92	6.06	1,935.61	U.L. Bend	188.7	10.26
10	111-0014	MONTANA SULPHUR & CHEMICAL CO	MONTANA SULPHUR & CHEMICAL	0.41	4.74	1,305.53	0.30	1,310.27	Absaroka	137.5	9.53
11	007-0002	GRAYMONT WESTERN US INC	GRAYMONT WESTERN US INC	93.83	363.06	161.17	1.85	524.23	GATES	57.1	9.18
12	111-0013	EXXONMOBIL FUELS & LUBRICANTS COMPANY	EXXONMOBIL BILLINGS REFINERY	73.28	435.75	598.65	578.93	1,034.41	Absaroka	143.7	7.20
13	111-0012	CENEX HARVEST STATES COOPERATIVE INC	CHS INC REFINERY LAUREL	43.36	420.60	208.13	1,114.77	628.73	Absaroka	113.5	5.54
14	029-0010	F H STOLTZE LAND & LUMBER CO	F.H. STOLTZE LAND AND LUMBER CO	60.12	68.62	6.60	23.41	75.22	Glacier	14	5.37
15	083-0002	SIDNEY SUGARS INC	SIDNEY SUGAR FACILITY	48.03	210.75	58.04	3.63	268.79	Teddy Roosevelt	51.9	5.18
16	085-0006	NORTHERN BORDER PIPELINE CO	N. BORDER PIPELINE CO STA. 3	1.47	91.50	4.25	10.98	95.76	Medicine Lake	19.8	4.84
17	111-0011	PHILLIPS 66 CO	BILLINGS REFINERY	57.17	540.05	104.87	534.35	644.92	Absaroka	143	4.51
18	029-0005	WEYERHAEUSER NR - KAUSPELL	WEYERHAEUSER-EVERGREEN	41.64	129.45	4.87	64.04	134.32	Glacier	30.5	4.40
Total Average Annual Emissions				1,569.64	21,827.41	14,889.00	3,408.27	36,716.41			
Total NOx+SO2 from all Montana Permitted Stationary Sources								40,594.17			
% of Total Represented by Selected Sources								90%			
								87% of Avg Annual NOx			
								96% of Avg Annual SO2			
Total PM10+NOx+SO2 from all Montana Permitted Stationary Sources								48,428.30			
% of Total Represented by Selected Sources								79%			
Totals from all Montana Permitted Stationary Sources				7,834.13	25,057.47	15,536.70	5,411.65				
% of Total Represented by Selected Sources				20.0%	87.1%	95.8%	63.0%				
Total NOx in MT 2014 NEI								112,521.59	Total emissions from those selected for potential control analysis		
Total NOx in MT 2014 NEI from Fuel Comb & Industrial								34,762.09			
Total NOx in MT 2014 NEI from Industrial - O&G								(4,453.56)	14,782.62 SO2		
Total NOx in MT 2014 NEI from Fuel Comb - Corette								(786.14)	95% % of total SO2		
Total NOx in MT 2014 NEI from Fuel Comb & Industrial (w/o O&G or Corette)								29,522.40	21,822.67 NOx		
Total NOx from Permitted Stationary Sources (2014)								19,662.26	87% % of total NOx		
% of MT 2014 NEI Fuel Comb & Industrial (w/o O&G or Corette) NOx from Permitted Stationary Sources								67%			
% of 2014 Permitted Stationary Source NOx from Selected Sources								83%			
Total SO2 in MT 2014 NEI								24,612.25			
Total SO2 in MT 2014 NEI from Fuel Comb & Industrial								22,525.15			
Total SO2 in MT 2014 NEI from Industrial - O&G								(285.18)			
Total SO2 in MT 2014 NEI from Fuel Comb - Corette								(1,433.13)			
Total SO2 in MT 2014 NEI from Fuel Comb & Industrial (w/o O&G or Corette)								20,806.84			
Total SO2 from Permitted Stationary Sources (2014)								11,881.25			
% of MT 2014 NEI Fuel Comb & Industrial (w/o O&G or Corette) SO2 from Permitted Stationary Sources								57%			
% of 2014 Permitted Stationary Source SO2 from Selected Sources								93%			

MONTANA Q/D LISTMONTANA SOURCES WITH Q>0.1

Montana Stationary Sources with Total Emissions of PM10-FIL+NO2+SO2>=100 TPY																			
Facility Identification			Average TPY (2014-2017)				Sum TPY		Class I Area Analysis										
	AIRS_NUMBER	MAILING_COMPANY	FACILITY_NAME	PM10-FIL	NO2	SO2	VOC	Q(A) PM10+NO2+SO2	Q(B) NO2+SO2	Nearest CIA	Distance to Nearest CIA (km)	Q(A)/d	Q(B)/d						
1	087-0008	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #1-4	517.59	13969.55	8895.52	307.43	23382.67	22865.08	UL Bend	198.9	117.6	115.0						
9	029-0008	WEYERHAEUSER NR - COLUMBIA FALLS	WEYERHAEUSER-CFALLS	202.78	969.60	14.77	561.65	1187.14	984.36	Glacier	13.3	89.3	74.0						
6	043-0001	ASH GROVE CEMENT COMPANY	ASH GROVE CEMENT	44.50	1029.91	205.21	3.79	1279.61	1235.11	Gates of the Mountains	30.6	41.8	40.4						
1	087-0008	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #4	197.61	4149.53	2327.78	115.01	6674.92	6477.31	UL Bend	198.9	6.0	6.0						
2	087-0008	TALEN MONTANA LLC	COLSTRIP STEAM ELECTRIC STATION #3	186.82	3983.48	2255.78	108.65	6426.08	6239.26	UL Bend	198.9	6.0	6.0						
7	083-0003	MONTANA DAKOTA UTILITIES CO	MDU - LEWIS & CLARK STATION	64.01	604.67	447.60	5.36	1116.29	1052.28	Teddy Roosevelt	51.8	21.5	20.3						
4	031-0005	OLDCASTLE MATERIAL CEMENT HOLDINGS, INC.	TRIDENT	135.67	1473.87	14.52	0.37	1624.06	1488.39	Yellowstone	97.4	16.7	15.3						
2	111-0023	YELLOWSTONE ENERGY LIMITED PARTNERSHIP	YELLOWSTONE POWER PLANT	19.83	404.32	1732.01	11.00	2156.16	2136.33	North Absaroka	143.8	15.0	14.9						
17	063-0002	ROSEBURG FOREST PRODUCTS CO	ROSEBURG FOREST PRODUCTS	142.96	299.28	3.33	180.35	445.57	302.61	Selway Bitterroot	26.6	16.8	11.4						
3	087-0007	COLSTRIP ENERGY LTD PARTNERSHIP	COLSTRIP ENERGY LTD PARTNERSHIP	23.01	811.68	1123.92	6.06	1958.61	1935.61	UL Bend	188.7	10.4	10.3						
12	007-0002	GRAYMONT WESTERN US INC	GRAYMONT WESTERN US INC	93.83	363.06	161.17	1.85	618.06	524.23	Gates of the Mountains	57.1	10.8	9.2						
5	111-0014	MONTANA SULPHUR & CHEMICAL CO	MONTANA SULPHUR & CHEMICAL	0.41	4.74	1305.53	0.30	1310.67	1310.27	North Absaroka	143	9.2	9.2						
8	111-0013	EXXONMOBIL FUELS & LUBRICANTS COMPANY	EXXONMOBIL BILLINGS REFINERY	73.28	435.75	598.65	578.93	1107.68	1034.41	North Absaroka	143.7	7.7	7.2						
11	111-0012	CENEX HARVEST STATES COOPERATIVE INC	CHS INC REFINERY LAUREL	43.36	420.60	208.13	1114.77	672.08	628.73	North Absaroka	113.5	5.9	5.5						
25	029-0010	F H STOLTZE LAND & LUMBER CO	F.H. STOLTZE LAND AND LUMBER CO	60.12	68.62	6.60	23.41	135.34	75.22	Glacier	14	9.7	5.4						
18	083-0002	SIDNEY SUGARS INC	SIDNEY SUGAR FACILITY	48.03	210.75	58.04	3.63	316.82	268.79	Teddy Roosevelt	51.9	6.1	5.2						
10	111-0011	PHILLIPS 66 CO	BILLINGS REFINERY	57.17	540.05	104.87	534.35	702.09	644.92	North Absaroka	137	5.1	4.7						
21	029-0005	WEYERHAEUSER NR - KALISPELL	WEYERHAEUSER-EVERGREEN	41.64	129.45	4.87	64.04	175.96	134.32	Glacier	30.5	5.8	4.4						
13	005-0001	HAVRE PIPELINE COMPANY, LLC, A TEXAS LIMITED LIABI	BLAINE COUNTY #1	3.78	512.12	0.09	12.93	515.99	512.21	UL Bend	134.1	3.8	3.8						
14	003-0018	ROCKY MOUNTAIN POWER INC	ROCKY MOUNTAIN POWER	34.28	230.39	262.39	2.34	527.06	492.78	North Absaroka	183.6	2.9	2.7						
15	111-0007	WESTERN SUGAR	WESTERN SUGAR COOPERATIVE	37.11	237.91	120.85	5.15	395.88	358.76	North Absaroka	138.2	2.9	2.6						
20	013-0004	CALUMET MONTANA REFINING LLC	CALUMET MONTANA REFINING	34.46	141.72	29.34	146.37	205.52	171.06	Gates of the Mountains	76	2.7	2.3						
28	095-0001	STILLWATER MINE	STILLWATER MINE	79.13	63.23	0.92	1.14	143.28	64.15	Yellowstone	39.3	3.6	1.6						
24	093-0009	MONTANA RESOURCES INC	CONTINENTAL PIT	666.38	70.14	12.49	0.02	749.01	82.63	Anaconda-Pintler	51.9	14.4	1.6						
22	025-0001	ONEOK ROCKIES MIDSTREAM, L.L.C. (ORM)	BAKER PLANT	1.02	55.96	70.87	47.22	127.85	126.82	Teddy Roosevelt	80.2	1.6	1.6						
16	087-0004	WESTERN ENERGY CO	ROSEBUD COUNTY WESTERN ENERGY MINE	1457.41	280.82	30.65	1.66	1768.87	311.46	UL Bend	199.7	8.9	1.6						
27	097-0001	STILLWATER MIINE - EAST BOULDER MINE	STILLWATER EAST BOULDER	38.37	65.04	0.10	0.10	103.52	65.14	Yellowstone	50.7	2.0	1.3						
19	003-0003	SPRING CREEK COAL LLC	SPRING CREEK MINE	1058.06	160.26	18.85	0.00	1237.17	179.11	North Absaroka	202.9	6.1	0.9						
26	065-0003	SIGNAL PEAK ENERGY LLC	SIGNAL PEAK ENERGY - BULL MOUNTAIN MINE	348.71	71.41	0.00	0.00	420.12	71.41	UL Bend	137.9	3.0	0.5						
29	003-0002	WESTMORELAND RESOURCES INC	ABSALOKA MINE	537.95	50.23	11.81	0.58	599.99	62.04	UL Bend	192.9	3.1	0.3						
30	003-0004	DECKER COAL CO	DECKER MINE	793.33	39.40	4.64	0.00	837.36	44.03	North Absaroka	205.9	4.1	0.2						
31	043-0002	BARRICK GOLDEN SUNLIGHT MINE	BARRICK GOLDEN SUNLIGHT MINE	245.36	8.57	0.74	0.05	254.67	9.31	Anaconda-Pintler	90.7	2.8	0.1						
Sum Emissions 1-31 (PM10+NOx+SO2>100)				6,903.53	23,723.12	15,448.46	3,614.86	46,075.10	39,171.58	# Sources with Q/d >10		10	8						
NOx+SO2>100				% of Total MT Stationary Source Emissions				88.1%	94.7%	99.4%	66.8%	95.1%	96.5%	% Total Emissions		71.3%	78.8%	68.5%	
PM10+NOx+SO2>100												# Sources with Q/d >8				13	10		
Sum Emissions 1-22 (NOx+SO2>100)				4,134.18	23,286.47	15,411.17	3,589.55	42,831.83	38,697.64	% Total Emissions		77.9%	83.3%	72.4%					
				% of Total MT Stationary Source Emissions				52.8%	92.9%	99.2%	66.3%	88%	95.3%	# Sources with Q/d >5		19	14		
												% Total Emissions				86.6%	88.3%	77.0%	
				Total # Stationary Sources				271					# Sources with Q/d >4				20	16	
				Total Q(A) from all Stationary Sources				48,428.30					% Total Emissions				88.3%	90.2%	78.9%
				Total Q(B) from all Stationary Sources				40,594.17					# Sources with Q/d >2				29	20	
												% Total Emissions				94.9%	94.0%	82.3%	
				Sum Emissions (Q/d>4)				1,568.17	21,735.91	14,884.75	3,397.29	38,188.82	36,620.66	# Sources with Q/d >1.5		30	24		
				% of Total MT Stationary Source Emissions				20.0%	86.7%	95.8%	62.8%	79%	90.2%	% Total Emissions		95.1%	95.4%	88.0%	

For sources
selected
using Q(B), %
Total Q(A)

APPENDIX D: COLSTRIP UNITS 1 & 2 AND MDU-LEWIS & CLARK UNIT RETIREMENT DOCUMENTATION

MDU – LEWIS & CLARK DOCUMENTATION

UNIT 1 RETIREMENT NOTIFICATION, TITLE V REVOCATION, AND MONTANA AIR QUALITY PERMIT (MAQP) UPDATE TO REMOVE BOILER



July 19, 2021

Ed Warner
Lead Engineer
Permitting Services Section, Air Quality Bureau
Montana Department of Environmental Quality
1520 East 6th Avenue
P.O. Box 200901
Helena, Montana 59620-0901

Re: Unit 1 Retirement Notification
Montana-Dakota Utilities
Lewis & Clark Station
MAQP 0691-06
OP0691-08

Dear Mr. Warner:

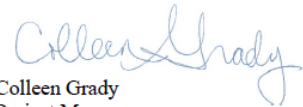
On behalf of Montana-Dakota Utilities (Montana-Dakota), please allow the following correspondence to serve as Montana-Dakota's formal notice to the Montana Department of Environmental Quality (MDEQ) of retirement of permitted equipment. As of April 1, 2021, Lewis & Clark Station Unit 1 was permanently retired. This unit is permitted as EU01 under the facility's most recent Title V Operating Permit #OP0691-08, issued May 13, 2021.


As such, Montana-Dakota is requesting the Lewis & Clark Station be no longer subject to the Title V Operating Permit program and operating permit #OP0691-08 be rescinded. In addition, Montana-Dakota requests their Montana Air Quality Permit (MAQP) #0961-06 be modified to remove references to Unit 1 from the permit. A markup permit with requested modifications to MAQP #0691-06 is enclosed.

Should additional information or detail be necessary, please feel free to contact Therese Dorigan at 773-320-9231 or tdorigan@burnsmcd.com.

Thank you for your time and attention to this filing.

Respectfully submitted,


Colleen Grady
Project Manager
Facility Decommissioning & Demolition Services


Therese M. Dorigan
Department Manager
Air & Noise Regulatory Compliance

Attachment
Certification of Truth, Accuracy, and Completeness

cc: United States Environmental Protection Agency
Todd Peterson – Montana-Dakota Utilities

1431 Opus Place, \ Suite 400 \ Downers Grove, IL 60515
☎ 630-724-3200 \ F 630-724-3201 \ burnsmcd.com

February 24, 2022

Todd Peterson, CHMM
Environmental Specialist
III Montana-Dakota
Utilities 400 North 4th
Street Bismarck, ND 58501

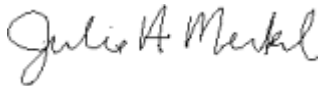
SENT VIA EMAIL: todd.peterson@mdu.com

Re: Revocation of Title V Operating Permit #0691-08

Dear Mr. Peterson:

Title V Operating Permit (OP) #0691-08 have been deemed revoked as of February 23, 2022, by the Department of Environmental Quality (Department) in accordance with ARM 17.8.1220. Once an operating permit is revoked, an operating permit application must be submitted if the source implements a change in operation that would result in the facility becoming subject to the Air Quality Operating Permit Program (ARM 17.8.1204).

For the Department,



Julie A. Merkel
Permitting Services Section Supervisor
Air Quality Bureau
(406) 444-3626



John P. Proulx
Environmental Science Specialist II
Air Quality Bureau
(406) 444-5391

Montana Air Quality Permit (MAQP) 0691-07 that removed Boiler #1 and associated conditions and emissions from air quality permit can be found here: <https://deq.mt.gov/files/Air/AirQuality/Documents/ARMpermits/0691-07.pdf>

TALEN MONTANA – COLSTRIP UNITS 1 & 2 DOCUMENTATION



James M Parker, PE, Manager ECS
6640 Southridge Road, Billings, MT 59101,
james.parker@talenenergy.com, 406 281 2999

January 14, 2020

- Via Electronic Mail; Hard Copy to EPA Headquarters -

Mr. Ed Warner, Lead Engineer, Permitting Services
Montana Department of Environmental Quality
1520 E Sixth Avenue
PO Box 200901
Helena, MT 59620

Re: Acid Rain Program Retired Unit Exemption Notice – Colstrip Units 1&2

Dear Mr. Warner:

Following up to our January 10, 2020 notification that Colstrip Units 1&2 had permanently ceased operations (Unit 1 as of 1/2/20 and Unit 2 as of 1/3/20), these units are now exempt units under 40 CFR § 72.8 of the acid rain program. Per those provisions, in addition to that notice we are also submitting the attached Retired Unit Exemption forms.

Should you have any questions, please contact me at your convenience. Thank you.

Sincerely,

A handwritten signature in blue ink that reads "James M Parker".

James M Parker, PE
Manager, Environmental Compliance Services & Designated Representative

JMP/jmp

Attachments

eCC: Julie Merkel – MDEQ
Bob Gallagher, EPA – Helena
Sarah Loiacono – EPA Region VIII, Denver
CC: Retired Unit Exemption Office – EPA Headquarters



Retired Unit Exemption

For more information, see instructions and refer to 40 CFR 72.8, 97.405, 97.505, 97.605, 97.705, 97.805, and 97.905, or a comparable state regulation, as applicable.

This submission is: ☒ New ☐ Revised

STEP 1

Identify the unit by plant (source) name, State, plant code and unit ID#.

Plant (Source) Name	State	Plant Code	Unit ID#
Colstrip Steam Electric Station	MT	6076	1

STEP 2

Indicate the program(s) that the unit is subject to.

- ☒ Acid Rain ☐ CSAPR SO₂ Group 1
☐ CSAPR NO_x Annual ☐ CSAPR SO₂ Group 2
☐ CSAPR NO_x Ozone Season Group 1 ☐ Texas SO₂
☐ CSAPR NO_x Ozone Season Group 2

STEP 3

Identify the date on which the unit was (or will be) permanently retired.

January 3, 2020

STEP 4

If the unit is subject to the Acid Rain Program, identify the first full calendar year in which the unit meets (or will meet) the requirements of 40 CFR 72.8(d).

Calendar year starting January 1, 2021

STEP 5 Read the applicable special provisions.

Acid Rain Program Special Provisions

(1) A unit exempt under 40 CFR 72.8 shall not emit any sulfur dioxide and nitrogen oxides starting on the date that the exemption takes effect. The owners and operators of the unit will be allocated allowances in accordance with 40 CFR part 73 subpart B.

(2) A unit exempt under 40 CFR 72.8 shall not resume operation unless the designated representative of the source that includes the unit submits a complete Acid Rain permit application under 40 CFR 72.31 for the unit not less than 24 months prior to the date on which the unit is first to resume operation.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 72.8 shall comply with the requirements of the Acid Rain Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) For any period for which a unit is exempt under 40 CFR 72.8, the unit is not an affected unit under the Acid Rain Program and 40 CFR parts 70 and 71 and is not eligible to be an opt-in source under 40 CFR part 74. As an unaffected unit, the unit shall continue to be subject to any other applicable requirements under 40 CFR parts 70 and 71.

(5) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 72.8 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time prior to the end of the period, in writing by the Administrator or the permitting authority. The owners and operators bear the burden of proof that the unit is permanently retired.

(6) On the earlier of the following dates, a unit exempt under 40 CFR 72.8(b) or (c) shall lose its exemption and become an affected unit under the Acid Rain Program and 40 CFR parts 70 and 71: (i) the date on which the designated representative submits an Acid Rain permit application under paragraph (2); or (ii) the date on which the designated representative is required under paragraph (2) to submit an Acid Rain permit application. For the purpose of applying monitoring requirements under 40 CFR part 75, a unit that loses its exemption under 40 CFR 72.8 shall be treated as a new unit that commenced commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Annual Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.405 shall not emit any NO_x, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.405 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) *The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.405 shall comply with the requirements of the CSAPR NO_x Annual Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.*

(4) A unit exempt under 40 CFR 97.405 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart AAAAA, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Ozone Season Group 1 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.505 shall not emit any NO_x, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.505 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) *The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.505 shall comply with the requirements of the CSAPR NO_x Ozone Season Group 1 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.*

(4) A unit exempt under 40 CFR 97.505 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart BBBB, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Ozone Season Group 2 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.805 shall not emit any NO_x, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.805 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) *The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.805 shall comply with the requirements of the CSAPR NO_x Ozone Season Group 2 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.*

(4) A unit exempt under 40 CFR 97.805 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart EEEEE, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR SO₂ Group 1 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.605 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.605 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.605 shall comply with the requirements of the CSAPR SO₂ Group 1 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.605 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart CCCCC, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR SO₂ Group 2 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.705 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.705 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.705 shall comply with the requirements of the CSAPR SO₂ Group 2 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.705 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart DDDDD, as a unit that commences commercial operation on the first date on which the unit resumes operation.

Texas SO₂ Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.905 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.905 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.905 shall comply with the requirements of the Texas SO₂ Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.905 shall lose its exemption on the first date on which the unit resumes operation. A retired unit that resumes operation will not receive an allowance allocation under 40 CFR 97.911. The unit may receive allowances from the Supplemental Allowance Pool pursuant to 40 CFR 97.912. All other provisions of 40 CFR part 97 subpart FFFFF regarding monitoring, reporting, recordkeeping and compliance will apply on the first date on which the unit resumes operation.

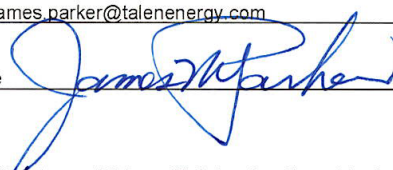
STEP 6 Read the statement of compliance and the applicable certification statements, sign, and date.

Statement of compliance

I certify that the unit identified above at STEP 1 was (or will be) permanently retired on the date identified at STEP 3 and will comply with the applicable Special Provisions listed at STEP 5.

Certification by designated representatives or alternate designated representatives

I am authorized to make this submission on behalf of the owners and operators of the source and unit for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name James M. Parker	Manager Environmental Compliance Title Services
Owner Company Name Talen Montana, LLC	
Email james.parker@talenenergy.com	Phone 406 281 2999
Signature 	Date 1/14/2020

Certification by certifying officials of units subject only to the Acid Rain Program for which no designated representative has been authorized

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name	Title
Owner Company Name	
Email	Phone
Signature	Date



Retired Unit Exemption

For more information, see instructions and refer to 40 CFR 72.8, 97.405, 97.505, 97.605, 97.705, 97.805, and 97.905, or a comparable state regulation, as applicable.

This submission is: ☒ New ☐ Revised

STEP 1

Identify the unit by plant (source) name, State, plant code and unit ID#.

Plant (Source) Name	State	Plant Code	Unit ID#
Colstrip Steam Electric Station	MT	6076	2

STEP 2

Indicate the program(s) that the unit is subject to.

- | | |
|---|--|
| <input checked="" type="checkbox"/> Acid Rain | <input type="checkbox"/> CSAPR SO ₂ Group 1 |
| <input type="checkbox"/> CSAPR NO _x Annual | <input type="checkbox"/> CSAPR SO ₂ Group 2 |
| <input type="checkbox"/> CSAPR NO _x Ozone Season Group 1 | <input type="checkbox"/> Texas SO ₂ |
| <input type="checkbox"/> CSAPR NO _x Ozone Season Group 2 | |

STEP 3

Identify the date on which the unit was (or will be) permanently retired.

January 3, 2020

STEP 4

If the unit is subject to the Acid Rain Program, identify the first full calendar year in which the unit meets (or will meet) the requirements of 40 CFR 72.8(d).

Calendar year starting January 1, 2021

STEP 5 Read the applicable special provisions.

Acid Rain Program Special Provisions

(1) A unit exempt under 40 CFR 72.8 shall not emit any sulfur dioxide and nitrogen oxides starting on the date that the exemption takes effect. The owners and operators of the unit will be allocated allowances in accordance with 40 CFR part 73 subpart B.

(2) A unit exempt under 40 CFR 72.8 shall not resume operation unless the designated representative of the source that includes the unit submits a complete Acid Rain permit application under 40 CFR 72.31 for the unit not less than 24 months prior to the date on which the unit is first to resume operation.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 72.8 shall comply with the requirements of the Acid Rain Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) For any period for which a unit is exempt under 40 CFR 72.8, the unit is not an affected unit under the Acid Rain Program and 40 CFR parts 70 and 71 and is not eligible to be an opt-in source under 40 CFR part 74. As an unaffected unit, the unit shall continue to be subject to any other applicable requirements under 40 CFR parts 70 and 71.

(5) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 72.8 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time prior to the end of the period, in writing by the Administrator or the permitting authority. The owners and operators bear the burden of proof that the unit is permanently retired.

(6) On the earlier of the following dates, a unit exempt under 40 CFR 72.8(b) or (c) shall lose its exemption and become an affected unit under the Acid Rain Program and 40 CFR parts 70 and 71: (i) the date on which the designated representative submits an Acid Rain permit application under paragraph (2); or (ii) the date on which the designated representative is required under paragraph (2) to submit an Acid Rain permit application. For the purpose of applying monitoring requirements under 40 CFR part 75, a unit that loses its exemption under 40 CFR 72.8 shall be treated as a new unit that commenced commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Annual Trading Program Special Provisions

- (1) A unit exempt under 40 CFR 97.405 shall not emit any NO_x, starting on the date that the exemption takes effect.
- (2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.405 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.
- (3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.405 shall comply with the requirements of the CSAPR NO_x Annual Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.
- (4) A unit exempt under 40 CFR 97.405 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart AAAAA, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Ozone Season Group 1 Trading Program Special Provisions

- (1) A unit exempt under 40 CFR 97.505 shall not emit any NO_x, starting on the date that the exemption takes effect.
- (2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.505 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.
- (3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.505 shall comply with the requirements of the CSAPR NO_x Ozone Season Group 1 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.
- (4) A unit exempt under 40 CFR 97.505 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart BBBBB, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR NO_x Ozone Season Group 2 Trading Program Special Provisions

- (1) A unit exempt under 40 CFR 97.805 shall not emit any NO_x, starting on the date that the exemption takes effect.
- (2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.805 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.
- (3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.805 shall comply with the requirements of the CSAPR NO_x Ozone Season Group 2 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.805 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart EEEEE, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR SO₂ Group 1 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.605 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.605 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.605 shall comply with the requirements of the CSAPR SO₂ Group 1 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.605 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart CCCCC, as a unit that commences commercial operation on the first date on which the unit resumes operation.

CSAPR SO₂ Group 2 Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.705 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.705 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.705 shall comply with the requirements of the CSAPR SO₂ Group 2 Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.705 shall lose its exemption on the first date on which the unit resumes operation. Such unit shall be treated, for purposes of applying allocation, monitoring, reporting, and recordkeeping requirements under 40 CFR part 97 subpart DDDDD, as a unit that commences commercial operation on the first date on which the unit resumes operation.

Texas SO₂ Trading Program Special Provisions

(1) A unit exempt under 40 CFR 97.905 shall not emit any SO₂, starting on the date that the exemption takes effect.

(2) For a period of 5 years from the date the records are created, the owners and operators of a unit exempt under 40 CFR 97.905 shall retain, at the source that includes the unit, records demonstrating that the unit is permanently retired. The 5-year period for keeping records may be extended for cause, at any time before the end of the period, in writing by the Administrator. The owners and operators bear the burden of proof that the unit is permanently retired.

(3) The owners and operators and, to the extent applicable, the designated representative of a unit exempt under 40 CFR 97.905 shall comply with the requirements of the Texas SO₂ Trading Program concerning all periods for which the exemption is not in effect, even if such requirements arise, or must be complied with, after the exemption takes effect.

(4) A unit exempt under 40 CFR 97.905 shall lose its exemption on the first date on which the unit resumes operation. A retired unit that resumes operation will not receive an allowance allocation under 40 CFR 97.911. The unit may receive allowances from the Supplemental Allowance Pool pursuant to 40 CFR 97.912. All other provisions of 40 CFR part 97 subpart FFFFF regarding monitoring, reporting, recordkeeping and compliance will apply on the first date on which the unit resumes operation.

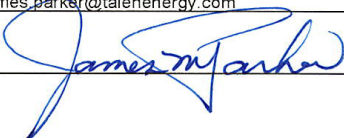
STEP 6 Read the statement of compliance and the applicable certification statements, sign, and date.

Statement of compliance

I certify that the unit identified above at STEP 1 was (or will be) permanently retired on the date identified at STEP 3 and will comply with the applicable Special Provisions listed at STEP 5.

Certification by designated representatives or alternate designated representatives

I am authorized to make this submission on behalf of the owners and operators of the source and unit for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name James M. Parker	Manager Environmental Compliance Title Services
Owner Company Name Talen Montana, LLC	
Email james.parker@talenenergy.com	Phone 406 281 2999
Signature 	Date 1/14/2020

Certification by certifying officials of units subject only to the Acid Rain Program for which no designated representative has been authorized

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name	Title
Owner Company Name	
Email	Phone
Signature	Date

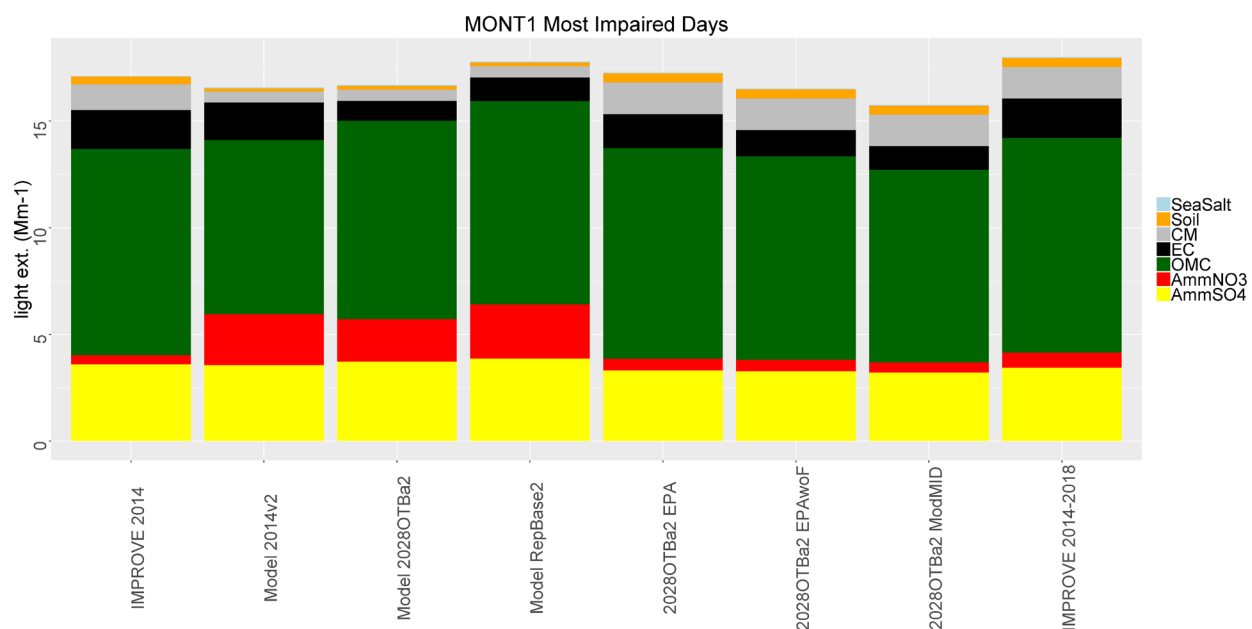
APPENDIX E – NORMALIZATION OF SOURCE APPORTIONMENT TO 2028 VISIBILITY PROJECTION

The purpose of this appendix is to outline a method that was used to “normalize” the 2028OTBa2 CAMx model source apportionment results to the overall 2028 visibility projections for each Federal Class I Area. When normalized, the sum of all regional and state/sector apportionment model outputs will correspond to the overall 2028 visibility projections when reviewing the species-specific or total light extinction. As presented on the TSS, the regional (high-level) and state/sector (low-level) model apportionment results are determined solely from the CAMx model output, and they will not correlate to the 2028 visibility projections until they are scaled to do so.

Annual average modeling results were used to provide a reasonable representation of the normalized regional, state, and/or sector-specific contributions to light extinction in 2028. The normalization procedure is outlined below.

A summary plot of the various modeling scenarios and IMPROVE monitoring data for MONT1, is shown in Figure E-1 below. As can be seen comparing the modeled 2028OTBa2 and the three projections (2028OTBa2 EPA, 2028OTBa2 EPAwoF, and 2028OTBa2 ModMID), the species-specific annual averages do not align due to the fact that the projections are scaled from the IMPROVE data using the RRFs, which is described in more detail in section 2.2.4 of Montana’s Regional Haze SIP.

FIGURE E-1 – MODELING SCENARIOS & IMPROVE DATA FOR MONT1



The first step is to determine the species-specific normalization factors, which are the factors that scale the annual modeling results to the annual projection results. As discussed in section 2.2.4 of Montana’s Regional Haze SIP, Montana chose to use EPA’s default methodology with the addition of removing those MIDs impacted by wildfire (EPAwoF).

TSSv2 Model Product 1 contains the annual modeling results (“Model 2028OTBa2”). Product 3 contains the projection results (“2028OTBa2 EPAwoF”). The scaling factors were determined as the ratio of the annual projection results to the annual modeling results for each species:

$$scaling_factor = \frac{2028OTBa2\ EPAwoF}{Model\ 2028OTBa2}$$

Table E-1 below displays the combined datasets and the resulting species-specific scaling factors for MONT1. The numerical results are in light extinction units, inverse megameters (Mm⁻¹).

TABLE E-1 – SPECIES-SPECIFIC SCALING FACTORS

SiteCode	ParamCode	DatasetCode.x	value.x	DatasetCode.y	value.y	scaling_factor
MONT1	AmmNO3	Model 2028OTBa2	2.002	2028OTBa2 EPAwoF	0.54	0.270
MONT1	AmmSO4	Model 2028OTBa2	3.717	2028OTBa2 EPAwoF	3.27	0.880
MONT1	CM	Model 2028OTBa2	0.526	2028OTBa2 EPAwoF	1.48	2.814
MONT1	EC	Model 2028OTBa2	0.943	2028OTBa2 EPAwoF	1.23	1.304
MONT1	OMC	Model 2028OTBa2	9.293	2028OTBa2 EPAwoF	9.54	1.027
MONT1	SeaSalt	Model 2028OTBa2	0.050	2028OTBa2 EPAwoF	0.04	0.799
MONT1	Soil	Model 2028OTBa2	0.171	2028OTBa2 EPAwoF	0.43	2.515

TSSv2 Model Product 9 contains the low-level source apportionment results, applicable only to ammonium sulphate and ammonium nitrate from U.S. anthropogenic emissions. Product 10 contains the high-level regional modeling results, applicable to all species and the broader source apportionment categories. See section 2.2.3 of Montana’s Regional Haze SIP for more details on the source apportionment modeling simulations. These two datasets are combined to form a dataset in which the more detailed low-level results are substituted for applicable high-level data (AmmNO3/AmmSO4 U.S_Anthro). This was done to build one dataset that leveraged all available source apportionment results.

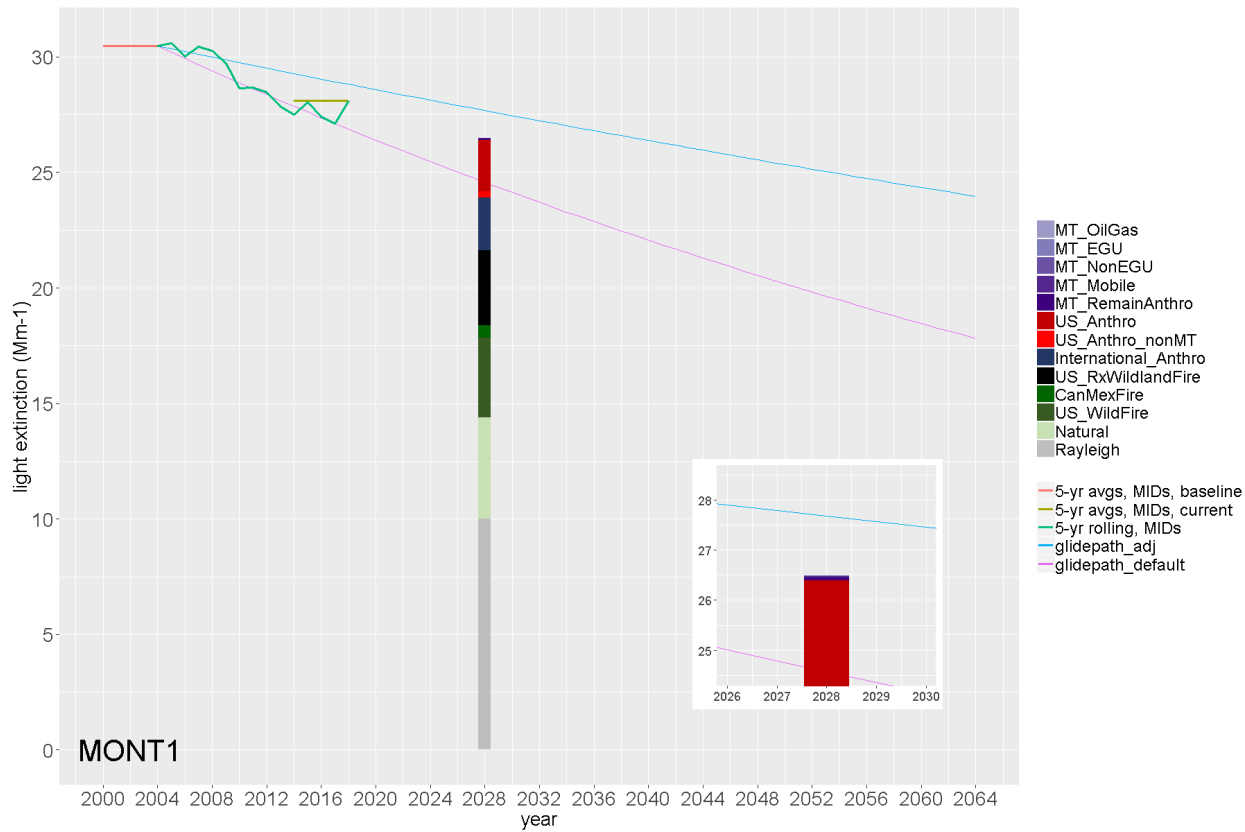
The scaling factor determined above can be applied to the modeled source apportionment results, to determine the “normalized” source apportionment results:

$$"normalized" \text{ modeled } SA = modeled\ SA \times scaling_factor$$

Table E-2 below displays a subset of the normalized combined source apportionment data for the MONT1 site, and the resulting “normalized” light extinction, in Mm^{-1} . This subset only shows coarse mass concentrations along with ammonium nitrate U.S. anthropogenic concentrations due to MT sources.

TABLE E-2 – NORMALIZED SOURCE APPORTIONMENT & LIGHT EXTINCTION (Mm^{-1})

ParamCode	CatCode	Source	Region	value	scaling factor	value scaled
CM	US_Anthro	US_Anthro	US_Anthro	0.345	2.814	0.970
CM	International_Anthro	International_Anthro	International_Anthro	0.057	2.814	0.160
CM	Natural	Natural	Natural	0.082	2.814	0.231
CM	US_WildFire	US_WildFire	US_WildFire	0.038	2.814	0.106
CM	US_RxWildlandFire	US_RxWildlandFire	US_RxWildlandFire	0.034	2.814	0.096
CM	CanMexFire	CanMexFire	CanMexFire	0.006	2.814	0.017
AmmNO3	International_Anthro	International_Anthro	International_Anthro	0.964	0.270	0.260
AmmNO3	Natural	Natural	Natural	0.438	0.270	0.118
AmmNO3	US_WildFire	US_WildFire	US_WildFire	0.033	0.270	0.009
AmmNO3	US_RxWildlandFire	US_RxWildlandFire	US_RxWildlandFire	0.136	0.270	0.037
AmmNO3	CanMexFire	CanMexFire	CanMexFire	0.017	0.270	0.005
AmmNO3	US_Anthro	RemainAnthro	MT	0.020	0.270	0.005
AmmNO3	US_Anthro	OilGas	MT	0.004	0.270	0.001
AmmNO3	US_Anthro	NonEGU	MT	0.012	0.270	0.003
AmmNO3	US_Anthro	Mobile	MT	0.080	0.270	0.022
AmmNO3	US_Anthro	EGU	MT	0.000	0.270	0.000



Source_Cat_combined	AmmNO3	AmmSO4	CM	EC	OMC	SeaSalt	Soil	Total
CanMexFire	0.03%	0.64%	0.11%	0.82%	1.73%	0.00%	0.02%	3.35%
International_Anthro	1.58%	9.03%	0.97%	0.91%	0.98%	0.00%	0.40%	13.86%
MT_EGU	0.00%	0.01%	-	-	-	-	-	0.01%
MT_Mobile	0.13%	0.03%	-	-	-	-	-	0.16%
MT_NonEGU	0.02%	0.07%	-	-	-	-	-	0.09%
MT_OilGas	0.01%	0.00%	-	-	-	-	-	0.01%
MT_RemainAnthro	0.03%	0.30%	-	-	-	-	-	0.33%
Natural	0.72%	5.74%	1.40%	0.19%	18.22%	0.25%	0.00%	26.52%
US_Anthro	-	-	5.88%	1.36%	4.15%	0.00%	2.07%	13.46%

Source_Cat_combined	AmmNO3	AmmSO4	CM	EC	OMC	SeaSalt	Soil	Total
US_Anthro_nonMT	0.52%	1.17%	-	-	-	-	-	1.69%
US_RxWildlandFire	0.22%	1.17%	0.58%	2.39%	15.06%	0.00%	0.16%	19.58%
US_WildFire	0.05%	2.14%	0.64%	2.41%	15.55%	0.00%	0.14%	20.94%
Total:	3.30%	20.31%	9.58%	8.08%	55.70%	0.25%	2.79%	100.00%

