UTAH AIR QUALITY BOARD MEETING

FINAL AGENDA

Wednesday, December 4, 2019 - 1:30 p.m.
195 North 1950 West, Room 1015
Salt Lake City, Utah 84116

I. Call-to-Order

II. Date of the Next Air Quality Board Meeting: January 8, 2020, and February 5, 2020


VII. Informational Items.
   A. **Air Toxics**, Presented by Leonard Wright.
   B. **Compliance**, Presented by Harold Burge and Rik Ombach.
   C. **Monitoring**, Presented by Bo Call.
   D. Other Items to be Brought Before the Board.
   E. Board Meeting Follow-up Items.

In compliance with the Americans with Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Larene Wyss, Office of Human Resources at (801) 536-4281, TDD (801) 536-4284 or by email at lwyss@utah.gov.
ITEM 3
MEMORANDUM

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: November 21, 2019

SUBJECT: PROPOSE FOR FINAL ADOPTION: SIP Subsection IX.A.36: PM$_{2.5}$ Maintenance Provisions for Salt Lake City, UT.

On January 2, 2019, the Utah Air Quality Board (Board) approved Utah State Implementation Plan (SIP) Subsection IX.A.31: Control Measures for Area and Point Sources, Fine Particulate Matter, Serious Area PM$_{2.5}$ for the Salt Lake City, UT Nonattainment Area (Serious SIP). The serious SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the attainment plan. The Serious SIP was submitted to the Environmental Protection Agency (EPA) on February 15, 2019.

Under the Clean Data Policy, EPA finalized a clean data determination for the Salt Lake City Nonattainment Area (SLC NAA) on September 27, 2019. The Clean Data Determination shows that the SLC NAA attained the 2006 24-hr PM$_{2.5}$ National Ambient Air Quality Standard (NAAQS) based on validated monitored data from 2016-2018, prior to the attainment deadline of December 31, 2019.

Attainment of the standard does not mean the area is reclassified to attainment status. The EPA must act to redesignate an area from nonattainment back to attainment status. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur.

This SIP submittal addresses the five CAA requirements:
1. Attainment of the NAAQS
2. Fully Approved Attainment SIP
3. Improvement in Air Quality is due to Permanent and Enforceable Emissions Reductions
4. The State has met requirements applicable to the area under CAA Section 110 and part D
5. Fully Approved Maintenance Plan
Requirements 1-4 are addressed in the first section of this SIP submittal as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP submittal and the modeling demonstration shows that the SLC area continues to attain the NAAQS out to 2035, with an intermediate year check in 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

The Board proposed this SIP subsection for public comment on September 4, 2019. A 30-day public comment period was held through the month of October. Comments were received and have been summarized and responded to in Attachment B of this memorandum. Comments were minimal and did not prompt any substantive changes to the SIP subsection. In addition to the few typographical changes, there were minor changes made to the plan as data and modeling were verified.

**Recommendation:** Staff recommends that the Board adopt SIP Subsection IX.A.36: PM$_{2.5}$ Maintenance Provisions for Salt Lake City, UT, as amended.

Attachment A: Amended SIP Subsection IX.A.36: PM$_{2.5}$ Maintenance Provisions for Salt Lake City, UT.

Attachment B: Response to Comments Received During the SIP Subsection IX.A.36 Comment Period
UTAH STATE IMPLEMENTATION PLAN

PM$_{2.5}$ Maintenance Provisions for the Salt Lake City, UT Nonattainment Area

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<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>BACM</td>
<td>Best Available Control Measure</td>
</tr>
<tr>
<td>BACT</td>
<td>Best Available Control Technology</td>
</tr>
<tr>
<td>CAA</td>
<td>Clean Air Act</td>
</tr>
<tr>
<td>CDD</td>
<td>Clean Data Determination</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CAMx</td>
<td>Comprehensive Air Quality Model with Extensions</td>
</tr>
<tr>
<td>DAQ</td>
<td>Utah Division of Air Quality (also UDAQ)</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>FR</td>
<td>Federal Register</td>
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<tr>
<td>MOVES</td>
<td>Motor Vehicle Emission Simulator</td>
</tr>
<tr>
<td>MPO</td>
<td>Metropolitan Planning Organization</td>
</tr>
<tr>
<td>MVEB</td>
<td>Motor Vehicle Emissions Budget</td>
</tr>
<tr>
<td>µg/m³</td>
<td>Micrograms Per Cubic Meter</td>
</tr>
<tr>
<td>Micron</td>
<td>One Millionth of a Meter</td>
</tr>
<tr>
<td>NAAQS</td>
<td>National Ambient Air Quality Standards</td>
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<tr>
<td>NH₃</td>
<td>Ammonia</td>
</tr>
<tr>
<td>NOₓ</td>
<td>Nitrogen Oxides</td>
</tr>
<tr>
<td>NNSR</td>
<td>Nonattainment New Source Review</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>Particulate Matter Smaller Than 10 Microns in Diameter</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>Particulate Matter Smaller Than 2.5 Microns in Diameter</td>
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<tr>
<td>R-307</td>
<td>Utah Administrative Code Air Quality Rules</td>
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<tr>
<td>RACM</td>
<td>Reasonably Available Control Measures</td>
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<td>RACT</td>
<td>Reasonably Available Control Technology</td>
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<tr>
<td>RFP</td>
<td>Reasonable Further Progress</td>
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<tr>
<td>SIP</td>
<td>State Implementation Plan</td>
</tr>
<tr>
<td>SLC NAA</td>
<td>Salt Lake City Nonattainment Area</td>
</tr>
<tr>
<td>SMAT</td>
<td>Software for Model Attainment Test</td>
</tr>
<tr>
<td>SMOKE</td>
<td>Sparse Matrix Operator Kernal Emissions</td>
</tr>
<tr>
<td>SO₂</td>
<td>Sulfur Dioxide</td>
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<tr>
<td>SOₓ</td>
<td>Sulfur Oxides</td>
</tr>
<tr>
<td>TPY</td>
<td>Tons Per Year</td>
</tr>
<tr>
<td>TSD</td>
<td>Technical Support Document</td>
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<tr>
<td>UAC</td>
<td>Utah Administrative Code</td>
</tr>
<tr>
<td>UT</td>
<td>Utah</td>
</tr>
<tr>
<td>VMT</td>
<td>Vehicle Miles Travelled</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compounds</td>
</tr>
<tr>
<td>WRF</td>
<td>Weather Research and Forecasting</td>
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Section IX.A.36
PM$_{2.5}$ Maintenance Provisions the for SLC, UT Nonattainment Area

IX.A.36.a Introduction

The Salt Lake City Nonattainment Area (SLC NAA) has attained the 2006 PM$_{2.5}$ 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the SLC NAA is eligible for redesignation to attainment. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved attainment SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the State has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.36.b, the SLC NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA’s approval of the SLC NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.36.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the SLC NAA will continue to maintain the 24-hour PM$_{2.5}$ NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA’s approval of the maintenance plan, the State is requesting that the SLC NAA be redesignated to attainment for the 2006 PM$_{2.5}$ 24-hour NAAQS.$^1$

a) Background

In October of 2006, EPA revised the 1997 NAAQS for PM$_{2.5}$. While the annual standard remained unchanged at 15 µg/m$^3$ until 2012, the 24-hr standard was lowered from 65 µg/m$^3$ to 35 µg/m$^3$. The Utah Division of Air Quality (UDAQ) has monitored PM$_{2.5}$ since 2000 and found that all areas have complied with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg/m$^3$, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the SLC NAA as nonattainment for the 2006 24-hour PM$_{2.5}$ NAAQS under the Act’s general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM$_{10}$ nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to PM$_{2.5}$ nonattainment areas. These provisions require EPA to classify a PM nonattainment area as “moderate” at the time it is designated nonattainment. If the area cannot attain the NAAQS by the attainment date, then EPA is required to

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$^1$ Concurrent with the State’s submittal of SIP Section IX.A.36 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the SLC NAA to attainment.
reclassify the area as “serious.” On June 2, 2014, the EPA classified the SLC NAA as a moderate nonattainment area with an attainment date of December 31, 2015.

The Act requires areas failing to meet the federal ambient PM$_{2.5}$ standard to develop a SIP with sufficient control requirements to expeditiously attain and maintain the standard. On December 22, 2014, UDAQ submitted a moderate area nonattainment SIP for the SLC NAA. The modeled attainment demonstration underlying the moderate SIP assessed the likelihood of attainment by the applicable attainment date of December 31, 2015, and concluded that it would be impracticable to do so.

After reaching the statutory attainment date, the EPA was compelled to determine whether the area had or had not achieved compliance with the standard by evaluating the prior three years of quality assured data. On May 10, 2017, EPA determined that the SLC NAA did not reach attainment of the 2006 24-hour standard by the attainment date (89 FR 21711). EPA subsequently reclassified the SLC NAA from a moderate PM$_{2.5}$ nonattainment area to a serious PM$_{2.5}$ nonattainment area on June 9, 2017.

Under Subpart 4 of the Act, serious PM nonattainment areas require, in addition to the provisions submitted to meet the moderate area planning requirements, the submittal of a SIP revision that: 1) provides for attainment of the applicable NAAQS no later than the end of the 10th calendar year after the area’s designation as nonattainment (December 31, 2019, for the SLC NAA), and 2) includes provisions to assure that the best available control measures (BACM) for the control of PM$_{2.5}$ and its precursors shall be implemented no later than four years after the date the area is re-classified as a serious area (June 9, 2021, for the SLC NAA). To fulfill the Subpart 4 requirements, Utah submitted a serious SIP to EPA, including a BACM analysis, on February 15, 2019, that demonstrates attainment of the PM$_{2.5}$ NAAQS by December 31, 2019. EPA SIP approval is discussed in more detail in IX.A.36.b(2).

The statutory attainment date for the SLC NAA is December 31, 2019. Under the 24-hour PM$_{2.5}$ NAAQS, compliance is determined by the average of three years of 98th percentile values. On June 5, 2019 (84 FR 26053), the EPA published a proposed rule in the Federal Register based on the validated data from 2016-2018, that the SLC NAA attained the 2006 primary and secondary 24-hour PM$_{2.5}$ NAAQS prior to the 2019 attainment date. The purpose of this SIP submittal is to demonstrate that the SLC NAA is eligible for redesignation to attainment (IX.A.36.b) and document a ten-year maintenance plan (IX.A.36.c).

### IX.A.36.b Redesignation Requirements

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment. Table IX.A.36.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.36.c below.

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Table IX.A.36. 1 Prerequisites to Redesignation in the Federal Clean Air Act

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Reference</th>
<th>Addressed in Section</th>
</tr>
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<tbody>
<tr>
<td>Attainment of Standard</td>
<td>Three consecutive years of PM$_{2.5}$ monitoring data must show that violations of the standard are no longer occurring</td>
<td>CAA §107(d)(3)(E)(i)</td>
<td>IX.A.36.b(1)</td>
</tr>
<tr>
<td>Approved SIP</td>
<td>The attainment SIP for the area must be fully approved</td>
<td>CAA §107(d)(3)(E)(ii)</td>
<td>IX.A.36.b(2)</td>
</tr>
<tr>
<td>Permanent and Enforceable Emissions Reductions</td>
<td>The State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable</td>
<td>CAA §107(d)(3)(E)(iii), Calcagni memo (Sect 3, para 2)</td>
<td>IX.A.36.b(3)</td>
</tr>
<tr>
<td>Section 110 and Part D requirements</td>
<td>The State must verify that the area has met all requirements applicable to the area under section 110 and Part D</td>
<td>CAA: §107(d)(3)(E)(v), §110(a)(2), Sec 171</td>
<td>IX.A.36.b(4)</td>
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<tr>
<td>Maintenance Plan</td>
<td>The Administrator has fully approved the Maintenance Plan for the area as meeting the requirements of CAA §175A</td>
<td>CAA: §107(d)(3)(E)(iv) and IX.A.36.b(5)</td>
<td>IX.A.36.b(5)</td>
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(1) The Area Has Attained the PM$_{2.5}$ NAAQS

CAA 107(d)(3)(E)(i) – *The Administrator determines that the area has attained the national ambient air quality standard.* To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA’s guidance$^3$ concerning area redesignations, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling.

Each component will be addressed in turn.

a) Ambient Air Quality Data (Monitoring) and Utah’s Monitoring Network

The NAAQS for PM$_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter ($\mu$g/m$^3$) for a 24-hour period and is met when the 98th percentile 24-hr concentration is less than or equal to 35 $\mu$g/m$^3$. Each year’s 98th percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating PM$_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr PM$_{2.5}$ standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu$g/m$^3$.

PM$_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 PM$_{2.5}$ NAAQS. UDAQ’s monitors are appropriately located to assess concentration, trends, and changes in PM$_{2.5}$.

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$^3$ John Calcagni. September 4, 1992. EPA Memorandum “Procedures for Processing Requests to Redesignate Areas to Attainment.”
concentrations. During Utah’s wintertime temperature inversions, daily sampling and real time
monitoring are necessary for both public notification and to provide data for the air quality models.

The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance
with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.36.1 on the following
page shows the location of sites along the Wasatch Front and in the Cache Valley that collect PM$_{2.5}$ data.
The ambient air quality monitoring network along Utah’s Wasatch Front and in the Cache Valley is
routinely audited by the EPA, and meets the agency’s requirements for air monitoring networks.
Data may be flagged when circumstances indicate that it would represent an event in the data set and not be indicative of the entire airshed or the efforts to reasonably mitigate air pollution within. 40 CFR 50.14, Section IX.A.36.
Treatment of air quality monitoring data influenced by exceptional events, anticipates this, and says that a State may request EPA to exclude data showing exceedances or violations of any national ambient air quality standard that are directly due to an exceptional event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, from use in determinations. The protocol for data handling dictates that flagging is initiated by the state or local agency, and then the EPA either concurs or indicates that it has not concurred.

Table IX.A.36.2 below shows the 98th percentile values in $\mu g/m^3$ for 2016, 2017, and 2018 as well as the three-year average of these values. The validated data in Table IX.A.36.2 excludes values at the Rose Park monitor from a firework event on July 4, 2017, and a wildfire exceptional event on September 6, 2017. On May 28, 2019, UDAQ received notice that EPA concurred with the State’s flag on both exceptional events. The three-year average, or design value from 2016-2018 was used by EPA in their proposed action of determination of attainment for the SLC NAA (84 FR 26053).

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>3 year average</th>
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<tr>
<td>Brigham City</td>
<td>35.0</td>
<td>36.2</td>
<td>26.2</td>
<td>32.4</td>
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<td>Ogden 2</td>
<td>39.0</td>
<td>27.1</td>
<td>24.6</td>
<td>30.2</td>
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<td>Bountiful</td>
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<td>35.2</td>
<td>25.7</td>
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<td>Hawthorne</td>
<td>38.4</td>
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<td>Rose Park</td>
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<td>32.4</td>
<td>29.2</td>
<td>34.9*</td>
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<td>24.9</td>
<td>28.2</td>
<td>29.0</td>
<td>27.3</td>
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<td>25.1</td>
<td>20.9</td>
<td>30.6</td>
<td>25.5</td>
</tr>
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</table>

Table IX.A.36.2 Monitored Ambient 24-hr PM$_{2.5}$ Data

*data excludes values from exceptional events that received EPA concurrence

b) Modeling Element

EPA guidance concerning redesignation requests and maintenance plans discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The SLC NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The SLC NAA clean data determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the PM$_{2.5}$ NAAQS through the year 2035 (see section IX.A.36.c).

---

4 EPA letter to UDAQ. Ref: 8ARD-PM. Concurrence on Exceptional Event Claim for July 4, 2017 PM$_{2.5}$ Data
5 EPA letter to UDAQ. Ref: 8ARD-PM. Concurrence on Exceptional Event Claim for September 6, 2017 PM$_{2.5}$ Data
6 Calcagni (n 3)
c) EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the SLC NAA is attaining the 24-hr PM$_{2.5}$ NAAQS. On June 5, 2019, EPA published notice in the Federal Register (84 FR 26053) that pursuant to CAA section 199(b)(2), “the EPA is proposing to make a clean data determination for the 2006 24-hr fine particulate matter (PM$_{2.5}$) Salt Lake City, UT nonattainment area.” This determination was based on quality-assured, quality-controlled, and validated ambient air monitoring data for 2016-2018.

(2) Fully Approved Attainment Plan for PM$_{2.5}$

CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).

On February 15, 2019, Utah submitted a serious SIP$^7$ for the SLC NAA that demonstrated attainment of the PM$_{2.5}$ NAAQS by the attainment date, December 31, 2019.

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area’s approved attainment date, are eligible for reduced regulatory requirements as described in EPA’s “Clean Data Policy.”$^8$ Under the Clean Data Policy, the EPA issued a proposed clean data determination on June 5, 2019 (84 FR 26053) for the SLC NAA. The approval status of both the moderate and serious SLC SIPs is dependent on the clean data determination requirements as detailed in 40 CFR 51.1015. For a serious PM$_{2.5}$ nonattainment area, a clean data determination suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the PM$_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the serious nonattainment area by a future date to be determined by the EPA. Table IX.A.36.3 details the EPA SIP approval status.

Additionally, EPA guidance$^9$ states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.36.3 that show pending approval may fall into this category.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>EPA Action &amp; Date</th>
<th>FR Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Year and Projection Year Emission Inventories</td>
<td>Pending Approval</td>
<td>--</td>
</tr>
<tr>
<td>Modeled Attainment Demonstration</td>
<td>Pending Approval</td>
<td>--</td>
</tr>
<tr>
<td>BACT</td>
<td>Pending Approval</td>
<td>--</td>
</tr>
</tbody>
</table>


$^9$ Calcagni (n 3)
### Table IX.A.36. 3 SLC, UT Serious SIP Approval Status

<table>
<thead>
<tr>
<th>Element</th>
<th>Approval Status</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Road Mobile BACM</td>
<td>Pending Approval</td>
<td></td>
</tr>
<tr>
<td>Non-Road Mobile BACM</td>
<td>Pending Approval</td>
<td></td>
</tr>
<tr>
<td>Area Source BACM</td>
<td>Pending Approval</td>
<td></td>
</tr>
<tr>
<td>MVEB</td>
<td>Clean Data Determination</td>
<td>84 FR 26053</td>
</tr>
<tr>
<td>Nonattainment New Source Review (R307-403)</td>
<td>Approved on 7/25/2019</td>
<td>84 FR 35832</td>
</tr>
<tr>
<td>Reasonable Further Progress</td>
<td>Clean Data Determination</td>
<td>84 FR 26053</td>
</tr>
<tr>
<td>Quantitative Milestones</td>
<td>Clean Data Determination</td>
<td>84 FR 26053</td>
</tr>
<tr>
<td>Contingency Measures</td>
<td>Clean Data Determination</td>
<td>84 FR 26053</td>
</tr>
</tbody>
</table>

The SIP elements still required under the clean data policy\(^{10}\) include emission inventories, NNSR requirements, and BACM/BACT. The EPA approved R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas on July 25, 2019 (84 FR 35832), which covers the NNSR requirement for the PM\(_{2.5}\) attainment plans. The State has submitted the emission inventories, and BACM/BACT elements to the EPA, including the R307-300 series amendments and the point source BACT emission limitation and operating practices (Utah SIP Section IX.H). These SIP elements are still pending EPA approval.

While many of the moderate and serious SIP elements are suspended under the clean data determination, many of the moderate SIP elements have been approved. As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control PM\(_{2.5}\) and PM\(_{2.5}\) precursors. On February 25, 2016 (81 FR 9343) and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and reasonably available control measures (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.36.4 for details on rules, approval dates, and implementation schedules.

For the SLC NAA, the BACM analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities.

### EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM\(_{2.5}\) SIPs

<table>
<thead>
<tr>
<th>Control Measures</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-302 Solid Fuel Burning Devices (^1)</td>
<td>EPA conditionally approved (^*) October 19, 2016 (81 FR 71988).</td>
</tr>
</tbody>
</table>

\(^1\) Environmental Protection Agency. August 24, 2016. Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements; Final Rule. 82 FR 58128.

Section IX.A.36
<table>
<thead>
<tr>
<th>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-304 Solvent Cleaning $^1$</td>
<td>December 6, 2017</td>
</tr>
<tr>
<td>R307-309 Nonattainment and Maintenance Areas for PM$<em>{10}$ and PM$</em>{2.5}$: Fugitive Emissions and Fugitive Dust $^1$ EPA proposed for approval September 14, 2017 (82 FR 43205).</td>
<td>Salt Lake County, Utah County, and the City of Ogden – January 1, 2013. Remaining NAAs – April 1, 2013. Amended August 4, 2017</td>
</tr>
<tr>
<td>R307-312 Aggregate Processing Operations for PM$_{2.5}$ Nonattainment Areas. EPA approved October 19, 2016 (81 FR 71988).</td>
<td>February 4, 2016</td>
</tr>
<tr>
<td>R307-342 Adhesives &amp; Sealants $^1$ EPA approved February 25, 2016 (81 FR 9343).</td>
<td>December 1, 2014</td>
</tr>
<tr>
<td>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM2.5 SIPs</td>
<td>Implementation Schedule</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Section IX.A.36
### EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs

<table>
<thead>
<tr>
<th>Control Measure Description</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-352 Metal Containers, Closure, and Coil Coatings ²</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td>Amended December 6, 2017</td>
</tr>
<tr>
<td>R307-353 Plastic Parts Coatings ¹</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td>Amended December 6, 2017</td>
</tr>
<tr>
<td>R307-354 Automotive Refinishing Coatings ¹</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td>Amended December 6, 2017</td>
</tr>
<tr>
<td>R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities ¹</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td>Amended March 8, 2018</td>
</tr>
<tr>
<td>R307-356 Appliance Pilot Light ¹</td>
<td>January 1, 2013</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-357 Consumer Products ¹</td>
<td>May 8, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-361 Architectural Coatings ¹</td>
<td>October 31, 2013</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
</tbody>
</table>

**Table IX.A.36. 4 Area Source Rules Implementation Schedule and EPA Approval Status**

1. Control measure implementation schedule and confirmation that measures have been implemented
2. Control measure implementation schedule and review if any new sources located in the NAA
3. *UDAQ submitted the committed revisions on February 1, 2017, within the one-year conditional approval window

The clean data determination has suspended all other elements of the SLC NAA PM$_{2.5}$ attainment plan, including reasonable further progress (RFP) plans, quantitative milestones, and contingency measures at this time. Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the SLC NAA.

**3) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions**

CAA 107(d)(3)(E)(iii) - The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and
enforceable reductions. Speaking further on the issue, EPA guidance\textsuperscript{11} reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

\textbf{a) Improvement in Air Quality}

The improvement in air quality with respect to PM\textsubscript{2.5} can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the SLC NAA, these control strategies were implemented as the result of both the moderate SIP and the serious SIP, submitted to EPA in December 2014 and February 2019, respectively. The various control measure effective dates are detailed in Tables IX.A.36.4 and IX.A.36.6.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored PM\textsubscript{2.5} (see Figures IX.A.36.2 and IX.A.36.3). The SLC NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98\textsuperscript{th} percentile average of 24-hr data as well as the annual arithmetic mean to understand trends. Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary PM\textsubscript{2.5}. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the PM\textsubscript{2.5} concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct PM\textsubscript{2.5} and PM\textsubscript{2.5} precursors. This variability is apparent in Figure IX.A.36.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of approximately one \(\mu\text{g/m}^3\) per year.

This episodic variability is reduced by looking at annual mean values of PM\textsubscript{2.5} concentrations shown in Figure IX.A.36.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98\textsuperscript{th} percentiles, as well as the values ranked even higher. Still, the trend is downward. Fitting a line through the data collected at the Hawthorne site (chosen because it has recorded, validated data since 2000 and consistently records the 2\textsuperscript{nd} highest values after Rose Park) reveals a trend that noticeably decreases and indicates an improvement of approximately 4.3 \(\mu\text{g/m}^3\) over the 18-year span.

Improvements must be considered in light of the attainment date as well as the date by which all controls must be implemented. For the SLC NAA, the attainment date is December 31, 2019; however, 40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date. Thus, for purposes of reasonable further progress and SIP credit, the deadline for control measure implementation is January 1, 2019. Any control measures implemented beyond such date are instead regarded as additional feasible measures (that other than timing, meet the definition of BACM). Thus, by the end of 2018, the control measure emission reduction will be reflected in the ambient data, while the additional feasible measures reduction will be reflected as late as June 9, 2021 (four years after the date that the SLC NAA was redesignated as serious). The

\textsuperscript{11} Calcagni (n 3)
requirement to ensure BACM/BACT is in addition to the requirements from the moderate Area SIP, which included RACM and RACT.

Figure IX.A.36. 2 SLC NAA PM$_{2.5}$ Annual Mean Concentration
Figure IX.A.36. 3 SLC NAA PM$_{2.5}$ 98th Percentile of 24-hr Concentration

i. Reduction in Emissions

As stated above, EPA guidance\textsuperscript{12} says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State should estimate the percent reduction (from the year that was used to determine the design value) achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.36.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the SLC NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the SLC NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date.

As defined in CAA Section 171(1), the term reasonable further progress means “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.” Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

\textsuperscript{12} Ibid
The RACM prescribed by the moderate nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the SLC NAA to EPA on March 23, 2018, within the 90-day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating “The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the enclosures. This determination is based on the EPA’s review of information contained in the Moderate Area Plans and additional information provided in the 2017 Quantitative Milestone Reports.” This approval letter is included in the TSD for this SIP submittal. Much of the downward trend in the ambient data as seen in Figures IX.A.36.2 and IX.A.36.3 is attributable to the controls implemented through the moderate SIP.

40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date, January 1, 2019, for the SLC NAA. Any control measures implemented beyond such date are instead regarded as additional feasible measures. Implementation schedules for point source control measures are included in Table IX.A.36.5. Emission reductions leading to lower ambient values can be observed in Figures IX.A.36.2 and IX.A.36.3, with further improvements expected beyond 2019 as a result of the more stringent BACM/BACT requirements. Included in the serious SIP for the SLC NAA are additional BACT emission limits for eight stationary point sources. The changes in these requirements are reflected in Section IX, Part H (Emission Limits and Operating Practices) of the SIP.
## Table IX.A.36. 5 Point Source Emission Control Measure Implementation Schedule and Compliance Mechanism

<table>
<thead>
<tr>
<th>Company</th>
<th>RACT Equipment Update(s)</th>
<th>BACT Requirement(s)</th>
<th>Implementation Schedule</th>
<th>Quantify Reduction (tons/yr)</th>
<th>Compliance Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATK Launch Systems Inc.</td>
<td>Two (2) 25 MMBTU/hr Natural Gas Boilers</td>
<td>Ultra Low Nox Burners</td>
<td>31-Dec-24</td>
<td>NOx ~ 10.44 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td>Big West Oil Company</td>
<td>Hydrocarbon Flares Limited routine flaring between Oct 1st</td>
<td>Date of SIP Approval</td>
<td>N/A</td>
<td>N/A</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td>and March 31st.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carbon Canisters/Fire Pumps</td>
<td>Miscellaneous Carbon Canister and Fire</td>
<td>31-Dec-19</td>
<td>VOC ~ 15.4 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pump Changes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Lime Company</td>
<td>Lime Kiln</td>
<td>Selective Non-catalytic Reduction</td>
<td>Upon Source Start-up</td>
<td>N/A</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New Baghouse</td>
<td>Upon Source Start-up</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATK Launch Systems Inc. Boilers</td>
<td>Replacement of 4 Placed limits on 3</td>
<td>31-Dec-19</td>
<td>N/A</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor Drivers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Removal of Boilers 1, 2, &amp; 4;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replacement with Boiler 7</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compass Minerals Boilers #1 &amp; #2 - Required Nox Limitations</td>
<td>Ultra low Nox burners/Upgrades to</td>
<td>31-Dec-19</td>
<td>NOx ~ 10 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baghouses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM2.5 Filterable and Condensable emission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>limits required for 14 emission points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hexel Corporation Carbon Fiber Lines</td>
<td>Addition of Filter Boxes on Lines 13 &amp; 14</td>
<td>31-Dec-19</td>
<td>PM 2.5 ~ 20 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>De-NOx Water Direct Fired Thermal Oxidizer</td>
<td>31-Dec-24</td>
<td>NOx ~ 75 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on Lines 13, 14, 15 &amp; 16</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Low-Nox Burners w/fuel gas re-circulation</td>
<td>31-Dec-24</td>
<td>NOx ~ 25.5 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on Lines 3, 4, &amp; 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hill Air Force Base Painting and De-painting</td>
<td>VOC emission limitation for painting</td>
<td>31-Dec-24</td>
<td>PM2.5 ~ 11.6 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>activities</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Boilers</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Requirement that no boilers manufactured</td>
<td>N/A</td>
<td>NOx ~ 434.38 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>after January 1, 1989</td>
<td></td>
<td>VOC ~ 8.53 tons/yr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Holly Corporation Wet Gas Scrubber &amp; Boiler</td>
<td>Installation of Wet Gas Scrubber and</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boiler Replacement</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Kennecott Utah Copper</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mine</td>
<td>Date of SIP Approval</td>
<td>PM2.5 ~ 4.33 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power Plant upgrades</td>
<td>1-Jan-19</td>
<td>NOx ~ 1,268.8 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit #4: Installation of SCR and Overfired Air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit #4: Lower ppm and lb/hr testing</td>
<td>1-Jan-19</td>
<td>NOx ~ 302.43 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>requirement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smelter &amp; Refinery Smelter &amp; Refinery</td>
<td>1-Dec-20</td>
<td>NOx ~ 35.04 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>upgrades</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tankhouse Boiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smelter &amp; Refinery upgrades</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nucor Steel Mills</td>
<td>No Changes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Pacificorp Energy Gadsby Power Plant</td>
<td>No Changes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Proctor &amp; Gamble Utility Boilers</td>
<td>PM2.5 Filterable and Condensable Limits &amp; Nox Limits</td>
<td>N/A</td>
<td>N/A</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Workload changes at facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tesoro Refining</td>
<td>Refinery Operations</td>
<td>31-Oct-19</td>
<td>N/A</td>
<td>AO DAQE-1003600075-18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Installation of Wet Gas Scrubber</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>University of Utah</td>
<td>Heating Plant</td>
<td>31-Dec-19</td>
<td>NOx ~ 44.29 tons/yr</td>
<td>AO Issuance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replacement of Boiler #9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Utah Municipal Power Agency Power Plant</td>
<td>No BACT required changes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vulcraft</td>
<td>No BACT required changes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control PM$_{2.5}$ and PM$_{2.5}$ precursors. For the serious SIP area source BACM review, each of UDAQ’s existing area source rules were re-evaluated to ensure that all appropriate source categories were addressed in rulemaking and that the level of control required is consistent with BACM. For newly identified controls or enhancement of existing controls, an evaluation was made to determine technological and economic feasibility. The BACM review resulted in revisions to 13 different area source rules which affect surface coating (for a variety of different surfaces), graphic arts, and aerospace manufacture & rework facilities. The rules and amendments are listed in Table IX.A.36.4. Table IX.A.36.6 shows the effectiveness of the area source rules within the SLC NAA.

<table>
<thead>
<tr>
<th>SLC NAA</th>
<th>Emissions Reduced in Pounds Per Day (lb/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Source Rule Name</td>
<td>NOx</td>
</tr>
<tr>
<td>R307-342 adhesive/sealants</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-355 aerospace manufacture &amp; rework</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-312 aggregate processing</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-347 appliance surface coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-354 automotive refinishing</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-352 metal container, closure &amp; coil coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-303 commercial cooking</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-357 consumer products</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-335 degreasing &amp; solvent cleaning</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-345 fabric &amp; vinyl coatings</td>
<td>5.8</td>
</tr>
<tr>
<td>R307-348 magnet wire coatings</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-346 metal furniture surface coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-350 misc metal parts &amp; product coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-361 architectural coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-344 paper/film/foil coating</td>
<td>3,383.8</td>
</tr>
<tr>
<td>R307-356 appliance pilot light</td>
<td>1,344.8</td>
</tr>
<tr>
<td>R307-221 landfill controls</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-230 water heaters</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-208 outdoor wood boilers</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-209 fugitive dust</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-211 landfills &amp; rework</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-221 landfill controls</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-230 water heaters</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-361 architectural coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-344 paper/film/foil coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-356 appliance pilot light</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-353 plastic parts coating</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Area Source Emissions Reduced</td>
<td>4,734.4</td>
</tr>
</tbody>
</table>
In reality, the NAAs should expect to see continued improvement in the next five to ten years as a result of the phase-in period of a number of the area source rules and some additional feasible measures installed at point sources. For example, the gas-fired water heater rule R307-230 requires that only ultra-low NOx gas-fired water heaters be sold or installed after July 1, 2018, but it takes years for water heater turnover to occur. In addition, the 13 rules that were revised during the serious SIP BACM review were implemented at the state level in 2018 and have a five-year phase-in period, resulting in full emission reduction by 2023. Therefore, additional emissions reductions will be seen. These phase-in periods were considered in the inventories used for modeling in this SIP.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce PM2.5. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales).

For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies SLC NAA

<table>
<thead>
<tr>
<th>SLC NAA</th>
<th>Emissions Reduced in Pounds Per Day (lb/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Source Rule Name</td>
<td>2019 Attainment Year</td>
</tr>
<tr>
<td></td>
<td>NOx</td>
</tr>
<tr>
<td>R307-342 adhesive/sealants</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-355 aerospace manufacture &amp; rework</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-312 aggregate processing</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-347 appliance surface coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-354 automotive refinishing</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-352 metal container, closure &amp; coil coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-303 commercial cooking</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-357 consumer products</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-335 degreasing &amp; solvent cleaning</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-345 fabric &amp; vinyl coatings</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-349 flat wood panel coatings</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-309 fugitive dust</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-351 graphic arts</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-208 outdoor wood boilers</td>
<td>5.8</td>
</tr>
<tr>
<td>R307-221 landfill controls</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-348 magnet wire coatings</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-346 metal furniture surface coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-350 misc metal parts &amp; product coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-361 architectural coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-344 paper/film/foil coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-356 appliance pilot light</td>
<td>5,834.7</td>
</tr>
<tr>
<td>R307-353 plastic parts coating</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-302 residential wood burning ban</td>
<td>1,332.3</td>
</tr>
<tr>
<td>R307-230 water heaters</td>
<td>1,396.8</td>
</tr>
<tr>
<td>R307-343 wood furniture manufacturing</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Area Source Emissions Reduced</td>
<td>8,569.5</td>
</tr>
</tbody>
</table>

Table IX.A.36. 6 Area Source Rule Emissions Reduction in SLC NAA
gasoline to the Wasatch Front market, are considered small refineries by EPA’s rule. As such, these refineries have a tier 3 delayed implementation date of January 1, 2020 to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

To supplement the federal motor vehicle control program, Inspection and Maintenance Programs were implemented in Salt Lake, Davis, and Weber Counties. These programs have been effective in identifying vehicles that no longer meet the emission standards for their respective makes and models and in ensuring that those vehicles are repaired in a timely manner.

Emissions from non-road mobile emission sources also benefit from several significant regulatory programs enacted at the federal level. This category of emitters includes airplanes, locomotives, handheld engines, and larger portable engines such as generators and construction equipment. The effectiveness of these controls has been incorporated into the “NONROAD” model UDAQ uses to compile the inventory information for this source category.

<table>
<thead>
<tr>
<th>SLC NAA Emissions by Year</th>
<th>Base Yr.</th>
<th>Projection Years with Growth &amp; Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016</td>
<td>2017</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>15.4</td>
<td>15.8</td>
</tr>
<tr>
<td>NOx</td>
<td>103.6</td>
<td>100.2</td>
</tr>
<tr>
<td>SO$_2$</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>VOC</td>
<td>91.7</td>
<td>91.5</td>
</tr>
<tr>
<td>NH$_3$</td>
<td>16.0</td>
<td>16.0</td>
</tr>
<tr>
<td>PM$_{2.5}$ Precursors</td>
<td>216.9</td>
<td>213.2</td>
</tr>
<tr>
<td>Total</td>
<td>232.3</td>
<td>229.0</td>
</tr>
</tbody>
</table>

*Emissions are reported in tons per average-episode-day

**Emission change per year, (ton/day) averaged from Base Year (2016) through Attainment Year (2019)

Table IX.A.36. 7 Emission Reductions in SLC NAA from all Controls in Serious SIP

The cumulative effect of all permanent and enforceable emission reductions is represented in Table IX.A.36.7. The emissions reductions resulting from federal programs and the RACM/RACT plus BACM/BACT controls incorporated into the Utah SIP and promulgated at the State level, result in emission reductions that are consistent with the notion of permanent and enforceable improvements in air quality. Taken together with the trends in ambient air quality illustrated in the preceding paragraph, along with the continued implementation of the nonattainment SIP for the SLC NAA, they provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.
(4) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to PM$_{2.5}$.

a) Section 110

The State has met all requirements applicable to the SLC NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 PM$_{2.5}$ NAAQS. EPA approved the State’s Infrastructure SIP on November 25, 2013 (78 FR 63883) for all Section 110 requirements that are applicable to redesignation.

b) Part D Subpart 1 and 4

Part D of the Act addresses “Plan Requirements for Nonattainment Areas.” Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA’s issuance of a final clean data determination demonstrating that the SLC NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review (“NNSR”) program, emissions inventory submission, and implementation of BACM/BACT. The State has satisfied these remaining requirements. Utah’s NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The BACM/BACT requirements and the emissions inventory were included in the serious SIP for the SLC NAA that the State submitted to the EPA on February 15, 2019. Upon EPA’s approval of these elements prior to or concurrently with EPA’s action on the maintenance plan/redesignation request, Utah will have complied with all applicable Part D requirements.

(5) Maintenance Plan for PM$_{2.5}$ Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.
IX.A.36.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Reference</th>
<th>Addressed in Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance demonstration</td>
<td>Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.</td>
<td>CAA: 175A(a)</td>
<td>IX.A.36.c (1)</td>
</tr>
<tr>
<td>Revise in 8 Years</td>
<td>The State must submit an additional revision to the plan, 8 years after redesignation, showing an additional 10 years of maintenance.</td>
<td>CAA: 175A(b)</td>
<td>IX.A.36.c (6)</td>
</tr>
<tr>
<td>Continued Implementation of</td>
<td>The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.</td>
<td>CAA: 175A(c), 110(l), Calcagni memo</td>
<td>IX.A.36.c (5)</td>
</tr>
<tr>
<td>Nonattainment Area Control Strategy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingency Measures</td>
<td>Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.</td>
<td>CAA: Sec 175A(d)</td>
<td>IX.A.36.c (8)</td>
</tr>
<tr>
<td>Verification of Continued Maintenance</td>
<td>The maintenance plan must indicate how the State will track the progress of the maintenance plan.</td>
<td>Calcagni memo</td>
<td>IX.A.36.c (7)</td>
</tr>
</tbody>
</table>

Table IX.A.36. 8 CAA Maintenance Plan Requirements

(1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and

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13 Ibid

14 Ibid
emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

(a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah’s NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient PM$_{2.5}$ during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

(b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

i. Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5. SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly and hourly values.
- Spatial: Convert emissions from a county-wide average to gridded emissions.
- Speciation: Decompose PM$_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct PM$_{2.5}$ and PM$_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA’s 2011v6 modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse...
for Inventories and Emissions Factors (CHIEF\textsuperscript{17}) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

ii. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.36.4). This configuration allows one to efficiently integrate regional effects with local impacts within the SLC NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.

![Figure IX.A.36. 4 CAMx Photochemical Modeling Domains in Two-Way Nested Configuration](image)

The UDAQ 4 km coarse domain covers the entire state of Utah, a significant portion of Eastern Nevada (including Las Vegas), as well as smaller portions of Idaho, Wyoming, Colorado, and Arizona. The fine 1.33 km domain covers all of Utah’s three PM\textsubscript{2.5} nonattainment areas, including the SLC NAA. Throughout this document, we will refer to the fine 1.33 km domain as the “modeling domain” when the coarse domain is not specified.

\textsuperscript{17} https://www.epa.gov/chief
iii. **Meteorological Data**

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ.

Meteorological inputs were derived using the Weather Research and Forecasting\(^\text{18}\) (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSD.

iv. **Episode Selection**

Part of the modeling exercise involves a test to see whether the model can successfully replicate the PM\(_{2.5}\) mass and composition that was observed during prior episode(s) of elevated PM\(_{2.5}\) concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance\(^\text{19}\) identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated PM\(_{2.5}\).
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah’s SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

\(^{18}\) [https://www.mmm.ucar.edu/weather-research-and-forecasting-model](https://www.mmm.ucar.edu/weather-research-and-forecasting-model)

\(^{19}\) Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM\(_{2.5}\), and Regional Haze.
In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour PM$_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

Previous work conducted by the University of Utah and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model$^{20}$. A comprehensive discussion of the meteorological model performance for all three episodes can be found in the meteorological modeling TSD$^{21}$.

### a) Model Adjustments and Settings

In order to better simulate Utah’s winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (Kvpatch)
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high PM$_{2.5}$ days (burn ban)
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry)
4. Cloud water content reduced during certain days (cloud adjustment)
5. Ammonia injection to account for missing ammonia sources in UDAQ’s inventory. This is defined as artificially adding non-inventoried ammonia emissions to the inventoried emissions that are input into CAMx.
6. Reduced the dry deposition rate of ammonia by setting ammonia Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
7. Applied a 93% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

Kvpatch improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

$^{20}$[https://www.mmm.ucar.edu/weather-research-and-forecasting-model](https://www.mmm.ucar.edu/weather-research-and-forecasting-model)

Cloud adjustments were only applied to the January 2011 episode, which was characterized by cloud
cover on January 6-8 over the Salt Lake and Utah valleys. This cloud cover led to a high bias in sulfate
due to the effect of ammonia on the gas-to-particle partitioning of sulfate in clouds. Application of the
cloud adjustment scheme helped reduce this bias.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The
burn ban adjustments reflect the compliance rate with the state’s two-stage policy ban on wood-burning.

A 93% reduction in paved road dust emissions was only applied to the January 2011 emissions. This
adjustment helped improve the model performance for crustal material.

b) Episodic Model Performance

Shown below for each of three episodes are the CAMx performance results for total 24-hour PM$_{2.5}$ mass
and PM$_{2.5}$ chemical species, including nitrate (NO$_3$), sulfate (SO$_4$), ammonium (NH$_3$), organic carbon
(OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other
mass).

January 1-10, 2011

A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011, at the Hawthorne
monitoring station in the SLC NAA showed that overall the model captures the temporal variation in
PM$_{2.5}$ well (Figure IX.A.36.5). The gradual increase in PM$_{2.5}$ concentration and its transition back to low
levels are generally well reproduced by the model. An overestimation in PM$_{2.5}$ is observed on January 3rd,
which is most likely related to the meteorological model performance on this day. Thin mid-level clouds,
which were observed on January 3-4, were not simulated in the WRF model, leading to an increasingly
stable low-level boundary layer, limiting the mixing of pollutants$^{22}$. To help reduce this bias, Kvpatch was
applied. The underestimation in PM$_{2.5}$ on January 5, 2011, at the Hawthorne station is also related to the
meteorological model performance on this day, where the WRF model overestimated the wind shear near
the mixing height$^{23}$.

$^{22}$https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-
wintertime-episodes/DAQ-2017-014342.pdf

$^{23}$https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-
wintertime-episodes/DAQ-2017-014342.pdf
The model performance for PM$_{2.5}$ chemical species was also good for this episode. The chemical composition of modeled PM$_{2.5}$ on January 7, which corresponds to a PM$_{2.5}$ exceedance day, is similar to that of measured PM$_{2.5}$ with modeled secondary species, nitrate, ammonium and sulfate, accounting for over 50% of PM$_{2.5}$ mass, in agreement with measurements (IX.A.36.6). Ammonia injection helped improve the model performance for these species. The model also performed well for organic carbon (OC) while it overestimated crustal material and elemental carbon (EC), possibly due to an overprediction in their source emissions. While a 93% reduction in paved road dust emissions was applied, it is possible that further reduction was needed.

Overall, the model simulated well the timing of the capping inversion during this January episode. PM$_{2.5}$ chemical species, particularly nitrate, are also well simulated in the model, suggesting that this episode is suitable for modeling.
Figure IX.A.36. 6 a) Measured and b) Modeled Species Contribution (in µg/m³ and %) to PM₂.₅ at Hawthorne Monitoring Station in the SLC NAA on a Typical 24-hr PM₂.₅ Exceedance Day

December 7-19, 2013

A comparison of modeled and measured 24-hr PM₂.₅ at Hawthorne during the December 7-19, 2013, episode showed that the model did not represent well the temporal variation in PM₂.₅ and the capping inversion (Figure IX.A.36.7). While observations show peak PM₂.₅ concentrations during December 14-15, CAMx is simulating a drop in PM₂.₅ levels. This can be attributed to the WRF model not properly capturing the cold overnight low temperatures that were observed on these days²⁴.

To further evaluate the model performance, modeled and measured PM$_{2.5}$ chemical species on December 15, which corresponds to a PM$_{2.5}$ exceedance day with available speciation measurements, were compared for Hawthorne (Figure IX.A.36.8). Nitrate and ammonium are both underpredicted in the model, which can be partly related to the meteorological model performance, where WRF overpredicted surface temperatures, leading to increased mixing. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied for the December 2013 simulations. Chloride (Cl) was also underestimated in the model while the performance for sulfate and OC was acceptable.

Given that the strength of the capping inversion and timing of the PM$_{2.5}$ peaks were not well simulated, using the December 2013 episode for the modeling demonstration is not desirable.
Figure IX.A.36 8 a) Measured and b) Modeled Chemical Composition of 24-hr PM$_{2.5}$ in µg/m$^3$ and % of PM$_{2.5}$ at Hawthorne Monitoring Station in SLC NAA on December 15, 2013

February 1-16, 2016

A comparison of modeled and measured 24-hr PM$_{2.5}$ at Hawthorne monitoring station (Figure IX.A.36.9) shows that PM$_{2.5}$ concentrations are generally biased low in the model and PM$_{2.5}$ drops off prematurely in the model. This can be related to the meteorological model performance, where the mixing height was overestimated due to performance issues related to clouds and fog formation. While fog and low clouds were observed during February 9-15, WRF was unable to properly capture the timing of the fog and clouds formation$^{25}$.

To further evaluate the model performance, modeled and measured PM$_{2.5}$ chemical species on February 12, which corresponds to a PM$_{2.5}$ exceedance day, were compared for Bountiful monitoring station (Figure IX.A.36.10). Complete speciation measurements were not available for Hawthorne. As can be seen, nitrate, ammonium and sulfate were underpredicted in the model. Moreover, similarly to the model performance for the two other episodes, EC and crustal material were overestimated in the model.

**Figure IX.A.36. 9 Measured and Modeled 24-hr PM$_{2.5}$ Concentrations During February 1-16, 2016, at Hawthorne Monitoring Station in the SLC NAA**

**Figure IX.A.36. 10 a) Measured and b) Modeled Chemical Composition of 24-hour PM$_{2.5}$ in µg/m$^3$ and % of PM$_{2.5}$ at Bountiful monitoring Station on February 12, 2016**
Given that the model is not able to sustain the observed PM$_{2.5}$ peaks, this episode is less suitable for modeling compared to the 2011 episode.

**Conclusion**

Examining the PM$_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with an exhaustive field campaign focused on the Salt Lake Valley (Persistent Cold Air Pool Study (PCAPS))$^{26}$. The superior model performance for the January 2011 episode was further confirmed by a linear regression analysis that showed that modeled and measured PM$_{2.5}$ at Hawthorne monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.80$) compared to the other episodes ($R^2 = 0.54$ and 0.69) (Figure IX.A.36.11).

Given that the January 2011 WRF data produced superior model performance when compared with the other two episodes, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the TSD.

$^{26}$ http://www.pcaps.utah.edu/
Figure IX.A.36. 11 Modeled versus measured 24-hr PM$_{2.5}$ at Hawthorne monitoring station for each of the three modeling episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode.

c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support
for the model modifications and settings that were applied (ammonia injection, increase of surface 
resistance to ammonia, zeroing-out of ozone deposition velocity, reduction of cloud-water content, snow 
albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more 
accurately reproduce winter-time inversion episodes. A detailed explanation of these model modifications 
is provided in the TSD.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data 
included 24-hr total PM$_{2.5}$ and 24-hr chemically-speciated PM$_{2.5}$ measurements collected at the 
Hawthorne monitoring station in the SLC NAA. Ammonia measurements collected during special field 
studies were also used for this performance evaluation. The evaluation was based on the December 31-
January 10, 2011, episode and the 2011 emissions inventory was used as input data for the model 
simulations. The evaluation focused on days with PM$_{2.5}$ concentration exceeding the NAAQS (> 35 
µg/m$^3$). Results for December 31, which is a model spin-up day, are excluded from this evaluation.

A more detailed model performance evaluation that examines the model performance for gaseous species 
is provided in the TSD. More details on the model performance at various sites within the SLC NAA are 
also included in the TSD.

**Daily PM$_{2.5}$ Concentrations**

A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011, at the Hawthorne 
monitoring station in the SLC NAA showed that the model overall captures the temporal variation in 
PM$_{2.5}$ well (Figure IX.A.36.12). The gradual increase in PM$_{2.5}$ concentration and its transition back to low 
levels are generally well reproduced by the model. Moreover, with the exception of January 3 and 5, the 
bias between measured and modeled PM$_{2.5}$ is overall relatively small, particularly on PM$_{2.5}$ exceedance 
days. The biases observed on January 3 and 5 are largely related to the meteorological model performance 
on these days, as aforementioned.

![Figure IX.A.36.12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hr Average PM$_{2.5}$ Concentrations During January 1-10, 2011, at Hawthorne Monitoring Station in the SLC NAA. Dashed Red Line is NAAQS for 24-hr PM$_{2.5}$](image)

**PM$_{2.5}$ Chemical Speciation**
To further investigate the model performance, measured and modeled PM$_{2.5}$ chemical species were compared at the Hawthorne monitoring site, which is part of EPA’s Chemical Speciation Network (CSN). Figure IX.A.36.13 shows a comparison of the bulk chemical composition of measured and modeled PM$_{2.5}$ at Hawthorne on January 7, 2011, which corresponds to the only PM$_{2.5}$ exceedance day when measurement data are available. Chemical species, including nitrate (NO$_3$), sulfate (SO$_4$), ammonium (NH$_4$), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass), were considered in this analysis. The model performance evaluation for non-PM$_{2.5}$ exceedance days is provided in the TSD.

The model performance for particulate nitrate, which is the major component of PM$_{2.5}$, was good, with both modeled and measured NO$_3$ accounting for similar contributions to PM$_{2.5}$ filter mass. Modeled and observed NO$_3$ concentrations were also comparable, with modeled concentration being biased low by about 15%. The model performance for particulate SO$_4$ was also reasonably good, with SO$_4$ being biased low in the model by about 27%. Similarly, to its performance for NO$_3$ and SO$_4$, the model was also biased low for NH$_4$ by about 34%. This underprediction in particulate NH$_4$ can be attributed to an underestimation in modeled HCl (more details are provided in the TSD). The model performance for OC was good for January 7, with modeled and observed concentrations being quite comparable. The model, on the other hand, overestimated EC and CM. The overprediction in these species on days when the simulated atmospheric mixing was particularly strong, suggests that this overestimation is potentially related to an overestimation in their source emissions.

**Figure IX.A.36.13** a) Measured and b) Modeled Species Contribution (in µg/m$^3$ and %) to PM$_{2.5}$ at Hawthorne Monitoring Station in the SLC NAA during a typical 24-hr PM$_{2.5}$ exceedance day
The model performance was also evaluated for ammonia (NH₃), which is an important precursor to the formation of ammonium nitrate, ammonium sulfate, and ammonium chloride, all of which are important PM₂.₅ species accounting for over 50% of the PM₂.₅ mass during winter-time inversion events.

Hourly modeled NH₃ (Figure IX.A.36.14) was compared to hourly NH₃ measurements (Figure IX.A.36.15) conducted at the Neil Armstrong Academy, located in West Valley City in the SLC NAA, during a special field study in winter 2016. Measurements from 2016 were considered since measurements of NH₃ were not available during 2011. Hourly measurements were also only available at the Neil Armstrong Academy. However, while these 2016 field study measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are qualitatively useful to assess if the model predicts similar levels of NH₃ during strong inversion conditions.

Modeled NH₃ at Hawthorne and the Neil Armstrong Academy is well within the range observed in 2016. It also displays a similar behavior to measured NH₃, with the concentration dropping during peak PM₂.₅ events.

![Hourly Time Series of Modeled Ammonia (ppb) at Hawthorne and Neil Armstrong Academy during January 1 – 10, 2011](image_url)
Summary of Model Performance

The model performance replicating the buildup and clear out of PM$_{2.5}$ is good overall. The model captures the temporal variation in PM$_{2.5}$ well. The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. The model also predicts reasonably well PM$_{2.5}$ concentration on peak days. It also overall replicates well the composition of PM$_{2.5}$ on exceedance days, with good model performance for secondary nitrate and ammonium which account for over 50% of PM$_{2.5}$ mass. Simulated ammonia concentrations are also within the range of those observed, further indicating that the model overall performs well.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is good and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach “should reduce some of the uncertainty attendant with using absolute model predictions alone.”

d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For any given (future) year, an attainment projection is made by calculating a concentration termed the Future Design Value (FDV). This value is calculated for each monitor included in the analysis, and then compared to the NAAQS (35 µg/m$^3$). If the FDV at every monitor located within a NAA is less than the NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan development. To be conservative, attainment projections were made for 2035. An assessment was also made for 2026 as a “spot-check” against emission trends within the ten-year span.
For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the 24-hour PM$_{2.5}$ NAAQS, which is the 98$^{th}$ percentile value averaged over a three-year period. Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan is 2017. This comparison results in a Relative Response Factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01 utility from EPA$^{27}$ to perform the modeled attainment test for daily PM$_{2.5}$. SMAT is designed to interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to the FRM monitors. It also calculates the relative response factor (RRF) for grid cells near each monitor and uses these to calculate a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was used as the boundary for RRF calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful, and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of three days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA. UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies. Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: $\text{FDV} = RRF \times \text{BDV}$. These FDV’s are compared to the NAAQS in order to determine whether attainment is predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.36.9.

For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued attainment is demonstrated for the SLC NAA.

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$^{27}$ [https://www.epa.gov/scram/photochemical-modeling-tools](https://www.epa.gov/scram/photochemical-modeling-tools)
Table IX.A.36. 9 Baseline and Future Design Values (µg/m³) at Monitors in SLC NAA

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<th>Monitor Location</th>
<th>2016-2018 BDV</th>
<th>2026 FDV</th>
<th>2035 FDV*</th>
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<td>Brigham City</td>
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<td>27.5</td>
<td>27.5</td>
</tr>
<tr>
<td>Bountiful</td>
<td>28.5</td>
<td>28.1</td>
<td>28.2</td>
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<tr>
<td>Hawthorne</td>
<td>33.4</td>
<td>31.8</td>
<td>32.1</td>
</tr>
<tr>
<td>Rose Park</td>
<td>34.9</td>
<td>33.5</td>
<td>33.6</td>
</tr>
<tr>
<td>Ogden</td>
<td>30.2</td>
<td>28.8</td>
<td>28.9</td>
</tr>
<tr>
<td>Erda**</td>
<td>25.5</td>
<td>23.0</td>
<td>23.1</td>
</tr>
</tbody>
</table>

*These values include additional emissions added to the WFRC MVEB from the safety margin

**Erda site uses 2016 speciation data instead of 2011 like the other SLC NAA monitors because Erda was a new site starting in 2016

(2) Attainment Inventory

The attainment inventory is discussed in EPA guidance28 as another one of the core provisions that should be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose of the attainment inventory is to establish the level of emissions during the time periods associated with monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used in a relative sense, the modeled baseline inventory is used for comparison with every projection year model run. For this analysis, the State compiled a baseyear inventory for the year 2017. This year falls within the span of data representing current attainment of the PM2.5 NAAQS. The guidance discusses the projection inventories as well, and notes that they should consider future growth, including population and industry, should be consistent with the baseyear inventory, and should document data inputs and assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources located within the modeling domain encompassing all three PM2.5 nonattainment areas, as well as a bordering region. See Figure IX.A.36.3.

Since this bordering region is so large, the State identified a “core area” within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current (2014) National Emissions Inventory from EPA for the analysis.

There are four general categories of sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried includes: PM2.5, SO2, NOX, VOC, and NH3. The unit of measure for point and area

28 Calcagni (n 3)
sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The
pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from
appropriate data sources, including information from the Governor’s Office of Management and Budget,
was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual
emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a
case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with
the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were
provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional
Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning
Organization, and are based on their travel demand modeling for 2017, 2026, and 2035. Non-road mobile
source emissions were calculated for each year using MOVES2014b. Growth data from appropriate data
sources was used to project to 2026 and 2035. The Technical Support Documentation accompanying this
SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035.
Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate
the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier
3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source
emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NOx from 2017 to 2026
due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will
continue to attain the PM$_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is
also necessary to “spot check” this ten-year interval. Hence, projection inventories were prepared for
2026 and 2035. Table IX.A.36.10 below summarizes these inventories. As described, it represents point,
area, on-road mobile, and non-road mobile sources in the modeling domain and includes PM$_{2.5}$, as well as
the precursors SO$_2$, NO$_x$, VOC, and NH$_3$ as defined in 40 CFR Parts 50, 51, and 93.

More detail concerning any element of the inventory can be found in the appropriate section of the TSD.
More detail about the general construction of the inventory can be found in the Inventory Preparation
Plan.
Table IX.A.36. 10 Emissions Inventories in Tons per Average Episode Day by Year and Source Category

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<tr>
<th>Emissions (tons/day)</th>
<th>Sector</th>
<th>PM$_{2.5}$ Filterable</th>
<th>PM$_{2.5}$ Condensable</th>
<th>PM$_{2.5}$ Total</th>
<th>NOx</th>
<th>VOC</th>
<th>NH$_3$</th>
<th>SO$_2$</th>
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</table>

(3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.36.b(3) are federally enforceable and, as demonstrated in IX.A.36.c(1) above, are sufficient to ensure continued attainment of the PM$_{2.5}$ NAAQS, there is no need to require any additional control measures to maintain the PM$_{2.5}$ NAAQS.

(4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Act requires regional transportation plans and programs to show that “…emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan…” EPA's transportation conformity regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012 ) also requires that motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be established for any years deemed appropriate (see 40 CFR 93.118(b)(2)(i)).

For an MPO’s Regional Transportation Plan, analysis years that are after the last year of the maintenance plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan.

a) Mobile Source PM$_{2.5}$ Emissions Budgets

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct PM$_{2.5}$, NO$_x$, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NO$_x$ and VOC, and for direct PM$_{2.5}$ (primary exhaust PM$_{2.5}$ + brake and tire wear).
(i) Direct PM$_{2.5}$, NO$_x$, and VOC

Direct (or “primary”) PM$_{2.5}$ refers to PM$_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct PM$_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct PM$_{2.5}$ includes road dust, brake wear, and tire wear as well as PM$_{2.5}$ from exhaust. Through atmospheric chemistry, NO$_x$ and VOC emissions can substantially contribute to secondary PM$_{2.5}$ formation. For this reason, NO$_x$ and VOC are considered PM$_{2.5}$ precursors and are the only PM$_{2.5}$ precursors emitted at a significant level by on-road mobile, and therefore included in the MVEBs.

EPA’s conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the “safety margin.” As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct PM$_{2.5}$, NO$_x$, and VOC in 2035 for the SLC NAA, are listed in the first row (original MVEB) in Table IX.A.36.11. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.36.c.(1) which estimates a maximum PM$_{2.5}$ concentration of 33.2 µg/m$^3$ in 2035 within the SLC NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the SLC NAA portion of the domain equates to 1.8 µg/m$^3$ (the 2006 24-hr PM$_{2.5}$ standard of 35.0 µg/m$^3$ minus the initial 2035 FDV of 33.2 µg/m$^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.36.11, Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the PM$_{2.5}$ standard. It estimates a maximum PM$_{2.5}$ concentration of 33.6 µg/m$^3$ in 2035 within the SLC NAA portion of the modeling domain, allocating .4 µg of the safety margin to on-road mobile emissions for the WFRC MVEB. The final 2035 MVEB for WFRC is listed in the last row of Table IX.A.36.11. The final WFRC MVEB is adjusted since Tooele and Box Elder counties are partially within the SLC NAA.
It is important to note that the MVEBs presented in Table IX.A.36.11 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.36.10.

Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.36.11), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, PM\(_{2.5}\) in the summary emissions inventory totals includes direct exhaust, tire and brake wear, and fugitive dust. For the MVEBs, PM\(_{2.5}\) includes direct exhaust, tire and brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states “If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan."

Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.36.9, the design values throughout the SLC NAA range from 23.0 to 33.5 µg/m\(^3\). The Rose Park monitor shows the highest value at 33.5 µg/m\(^3\), which is still 1.5 µg/m\(^3\) below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.36.12.
Since the projected design values are well below the standard, and the on-road budget is a relatively small percentage of the total inventory, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

(ii) Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct PM$_{2.5}$ emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct PM$_{2.5}$ emissions may be offset with future decreases in NO$_x$ emissions from on-road mobile sources at a NO$_x$ to PM$_{2.5}$ ratio of $\frac{5.9}{6.3}$ to 1 and/or future decreases in VOC emissions from on-road mobile sources at a VOC to PM$_{2.5}$ ratio of $\frac{24.3}{20.9}$ to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO$_x$ or VOC budgets, the NO$_x$ emission reductions available to supplement the direct PM$_{2.5}$ budget shall only be those remaining after the 2035 NO$_x$ budget has been met, and the VOC emissions reductions available to supplement the direct PM$_{2.5}$ budget shall only be those remaining after the 2035 VOC budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSD.

(5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect. The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from both PM$_{2.5}$ SIPs.

(6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Salt Lake City area to attainment, as required by the Act.

(7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by
monitoring the ambient air for PM$_{2.5}$; and 2) by inventorying emissions of PM$_{2.5}$ and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for PM$_{2.5}$ in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient monitoring network for PM$_{2.5}$ each year, and any necessary modifications to the network will be implemented.

Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

(8) Contingency Plan

**CAA 175A(d) -** Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the SLC NAA supersedes Subsection IX.A.31.9, Contingency Measures, which is part of the serious SLC NAA PM$_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

**a) List of Potential Contingency Measures**

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the PM$_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. There were no control measures relaxed in the SLC NAA; however, below are potential contingency measure that will be evaluated. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible. The following are potential contingency measures that may be considered by UDAQ:

1. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents 35.4% of direct PM$_{2.5}$ emissions in the 2017 county-wide inventory.

2. Measures to address fugitive dust from area sources. Fugitive dust represents 31.2% of direct PM$_{2.5}$ emissions in the 2017 county-wide inventory.
3. Additional measures to address other PM$_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, non-road vehicles and engines, and industrial sources. These source categories represent 35.8%, 13.0%, and 14.5%, respectively, of the overall 2017 baseyear emissions inventory. In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah’s NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of PM$_{2.5}$ concentrations. Generally speaking, the programs target Utah nonattainment areas. The programs include approximately $25.5$ million from the Volkswagen settlement and approximately $12.7$ million to replace heavy-duty diesel trucks and buses that are operating under old emissions standards. Nonroad diesel upgrades will see approximately $1.3$ million on the Wasatch Front. Approximately $1.3$ million will go towards upgrading non-road engines on the Wasatch Front. Another $3.8$ million of the Volkswagen funding will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using approximately $9.6$ million in federal funding to implement wood stove changeout programs throughout the three Utah PM$_{2.5}$ NAAs.

b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient PM$_{2.5}$ concentrations. In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate PM$_{2.5}$ monitoring network in SLC, Provo, and Logan NAAs.

c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean that the area will automatically be redesignated once again to nonattainment. Instead, the State will have an appropriate timeframe to correct the potential violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected. Upon notification of a potential violation of the PM$_{2.5}$ NAAQS, the State will develop appropriate contingency measures intended to prevent or correct a violation of the PM$_{2.5}$ standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedances, and the most recent estimates of growth and emissions will be reviewed. The possibility that an exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the PM$_{2.5}$ NAAQS, including exceedances flagged as exceptional events but not concurred with by EPA, the State will identify a means of corrective action within six months after a potential violation. The maintenance plan contingency measures will be chosen based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is confirmed. Any contingency measures adopted and implemented will become part of the next revised maintenance plan submitted to the EPA for approval.
Responses to Comments Regarding R307-110-10: Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter

Utah Petroleum Association

Comment Summary A-1: The Utah Petroleum Association (UPA) recommends adding a contingency measure to the contingency plan that would control the point source chloride emissions from the US Magnesium facility, located just west of the SLC NAA. UDAQ has previously acknowledged the significant contribution of chlorides to PM$_{2.5}$ concentrations in the SLC NAA; however, determined that there needs to be additional research into the source of the chloride emissions. UDAQ has funded a study to investigate chloride sources that concludes at the end of 2019.

UDAQ previously disagreed with UPA that chloride should be added as a plan precursor. UPA contends that chloride should be a plan precursor because the preamble of the 2016 SIP Requirements Rule states that chloride exists as a precursor in some areas and substantial evidence has shown that is the case in the SLC NAA airshed. The Utah SIP in its current form does not include chloride emission controls. Therefore, UPA recommends that UDAQ add point source chloride controls for the US Magnesium facility to the contingency measures of the Maintenance Plan.

UDAQ Response to Comment A-1: Ammonium chloride can account for 15% of PM$_{2.5}$ mass during high PM episodes in the SLC NAA. The source of the chloride that takes part in ammonium chloride formation is not well understood in the airshed. The UDAQ-funded field sampling campaign conducted in 2018-2019 will help elucidate our understanding of source chloride, including the potential contribution from the US Magnesium facility. Imposing controls on US Magnesium may be premature at this point.

As UDAQ has previously stated, chloride is not considered a PM$_{2.5}$ precursor per the 2016 SIP Requirements Rule. See Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 FR 58010, 58014, Table 1 (Aug. 24, 2016) (table listing SO$_2$, NOx, VOC, and NH$_3$ as precursors to PM$_{2.5}$). As the 2016 SIP Requirements Rule describes the composition of PM$_{2.5}$ in different areas, it points out that “less common ions such as chloride are also found in PM$_{2.5}$ samples in the form of particles that include sodium chloride and ammonium chloride.” (81 FR 58015). However, it does not mean that chloride is a precursor that must be regulated and assessed. As follow up guidance to the 2016 SIP Requirements Rule, EPA also issued a memorandum addressing precursor demonstration by the states. See Fine Particulate Matter (PM2.5) Precursor Demonstration Guidance (May 30, 2019) available at https://www.epa.gov/sites/production/files/2019-05/documents/transmittal_memo_and_pm25_precursor_demo_guidance_5_30_19.pdf. This guidance does not include chloride, but only addresses NOx, SO$_2$, NH$_3$, and VOC. See id. at 23, Table 1. Until UDAQ better understands chloride sources within the airshed, we are not required to apply point source controls for chloride.

Additionally, the SLC NAA is currently attaining the standard; therefore, no additional precursors or controls are required. If the contingency plan is triggered at some date in the future, UDAQ will assess contingency measures based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate at that time. The potential contingency measures currently listed in the maintenance plans are not necessarily the only contingency measures that UDAQ would consider if the contingency plan were triggered. Contingency measures that may be implemented do not have to be listed in the maintenance plan.
Considering maintenance demonstrations project ten to twenty years into the future, it is likely that new data will be available should the contingency plan be triggered in the future. UDAQ may consider all measures, including measures addressing new precursors, and sources outside of the NAA if necessary, to demonstrate attainment. Considering this information, UDAQ will not list US Magnesium facility controls as a potential contingency measure at this time.

Comment Regarding IX.A.36

Chevron Products Company

Comment Summary A-2: Table IX.A.36.5 Point Source Emission Control Measurement Implementation Schedule and Compliance Mechanism lists “Replacement of 4 Compressor Drivers: as a BACT requirement for the Chevron Products Company. The Salt Lake Refinery believes this to be an error. The Salt Lake Refinery requests that “Replacement of 4 Compressor Drivers” be removed from the table.

UDAQ Response to Comment A-2: UDAQ will edit the table to reflect Chevron’s Approval Order.

Comment Regarding IX.A.27

McWane Ductile

Summary of Comment A-3: McWane Ductile (MDU) believes that UDAQ made a typographical error in identifying MDU's VOC limits in the Maintenance Plan for Provo. On page 14, UDAQ identifies the RACT Equipment updates for MDU is "limiting VOC emissions" to "118.16 tons /yr.” The tpy figure, however, is incorrect. The VOC limit as 118.16 tons per year: the VOC emission limit expressed in MDU's Approval Order is 161.78 tons per year.

UDAQ Response to Comment A-3: UDAQ agrees with the commenter and will edit IX.A.27 accordingly.

Comments Regarding IX.A.28

Citizen Comments

Summary of Comment A-4: A commenter asked if there were any enforceable reductions that applied to the general public in the Logan area.

UDAQ Response to Comment A-4: The Cache County Inspection and Maintenance Program was implemented as part of the attainment strategy for the Logan area. This enforceable additional reasonable measure was approved by EPA and applies to any vehicle owner that registers a vehicle in Cache County, Utah.

Summary of Comment A-5: A commenter pointed out that there was not enough public awareness of the proposed maintenance SIP.

UDAQ Response to Comment A-5: By statute during rule proposal stage, UDAQ is required to send a copy of rule analysis to anyone who has requested it, to any person the agency is required by law to notify
(as a result of federal mandate or statute), or to any person who in the agency’s judgment is required to be notified. See Utah Code § 63G-3-301(10). The proposed rule is then published by the Office of Administrative Rules in the Utah State Bulletin, which is publicly available at https://rules.utah.gov/publications/utah-state-bull/. See id. § 63G-3-402. This is how the general public is notified of the proposed rules. UDAQ complied with these requirements.

In addition, Division of Air Quality staff sent out a notice of rulemaking actions by the Utah Air Quality Board by email on September 12th, multiple days before the 30-day public comment period began on October 1st. The email is available to those who sign up to receive it using the following google docs form:
https://docs.google.com/forms/d/e/1FAIpQLSfVDtgNkUTHrJeRgqmrM2jKk7uZ1ZhDNenjiBymv8JlUFcaqCw/viewform. The email included a link to review the documents which were presented to the Board, which can be found at the following: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. Also included was a link to the state bulletin (as noted above) and a link to the Division of Air Quality website which brings the user to a webpage for current air quality rule and plan changes open for public comment (https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment).

Furthermore, the audio recording of the meeting and the packet were both available online on the Utah Public Notice website on September 6th. The final minutes were not available until October 7th as they had to be approved by the Board before becoming finalized. The information for each Board meeting can be found by going to https://utah.gov/pmn/index.html, clicking on “state”, then “Department of Environmental Quality”, then “Air Quality Board”. After that, the user is able to choose from the listed Board meetings on the website to find the information described earlier in this paragraph.

**Summary of Comment A-6:** A commenter agreed that emissions testing should be discontinued for the vehicles covered by the two-speed idle program because those emissions have minimal impact.

**UDAQ Response to Comment A-6:** UDAQ performed a 110(l) demonstration that supports this comment.

**Summary of Comment A-7:** A commenter would have appreciated a better summary of the proposed rulemaking and making the summary more accessible.

**UDAQ Response to Comment A-7:** The process of creating a maintenance plan is iterative. Multiple rules have been adopted and amended by the Air Quality Board over the years which were referenced in the maintenance plans. Those rules, since adopted and amended during different periods of time, were not available for public comment at the same time as the maintenance plans because they were already established rules at the time. All proposed rulemaking must follow the same legal process as outlined in the first paragraph of **UDAQ Response to Comment A-5.** Summaries for the specific maintenance plans are available in the Board memos which are included in the packets and can be found at two different locations on the DEQ website. The first location contains the documents for the entire September meeting: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. The second link will bring up only what is currently out for public comment. This is the link for the current rules and plans out for public comment: https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment. Individuals are able to sign up to receive an email of advanced notice of rulemaking actions by the Board by going to the following form and inputting their information.
https://docs.google.com/forms/d/e/1FAIpQLSfVDtgNkUTHrJeRgqmrM2jKk7uZ1ZhDNenjiBymv8JlUFcaqCw/viewform.
Summary of Comment A-8: A commenter was concerned that the removal of the two speed idle portion of the Inspection and Maintenance Program would allow for vehicles that had been getting registered across the border in Idaho to come back across the border and register in Utah since the emission testing would no longer apply.

UDAQ Response to Comment A-8: It is possible that older vehicles will be registered now in Utah instead of Franklin. However, the airshed they operate in is the same regardless of where they are registered. It is likely that these vehicles will be driving in the same areas as when they may have been registered in Idaho.

Summary of Comment A-9: A commenter was concerned that the air quality model results supporting this SIP do not project for population grown and exclude events outside of the State’s control, such as fires, which means that air quality standards may not be met in the future.

UDAQ Response to Comment A-9: Projection inventories used for air quality modeling include appropriate population growth. Each source category inventory deals with population growth depending on the latest data and population estimates. See the technical support documentation for specific source categories and how population growth was applied. The UDAQ follows the Treatment of Data Influenced by Exceptional Events set forth in 81 FR 68216 to determine if an event was out of the State’s control.
ITEM 4
MEMORANDUM

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: November 21, 2019

SUBJECT: PROPOSE FOR FINAL ADOPTION: SIP Subsection IX.A.27: PM$_{2.5}$ Maintenance Provisions for Provo, UT.

On December 3, 2014, the Utah Air Quality Board (Board) approved the Utah State Implementation Plan (SIP) Subsection IX.A.22: Control Measures for Area and Point Sources, Fine Particulate Matter, PM$_{2.5}$ for the Provo, UT-ID Nonattainment Area (Moderate SIP). The Moderate SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the moderate area designation attainment plan. In addition to the Moderate SIP, SIP elements addressing Provo’s serious designation were submitted to the Environmental Protection Agency (EPA) in February 2019.

Under the Clean Data Policy, EPA finalized a clean data determination for the Provo Nonattainment Area (Provo NAA) on April 10, 2019. The Clean Data Determination shows that the Provo NAA attained the 2006 24-hr PM$_{2.5}$ National Ambient Air Quality Standard (NAAQS) based on validated monitored data from 2015-2017.

Attainment of the standard does not mean the area is reclassified to attainment status. The EPA must act to redesignate an area from nonattainment back to attainment status. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur.

This SIP submittal addresses the five CAA requirements:
1. Attainment of the NAAQS
2. Fully Approved Attainment SIP
3. Improvement in Air Quality is due to Permanent and Enforceable Emissions Reductions
4. The State has met requirements applicable to the area under CAA Section 110 and part D
5. Fully Approved Maintenance Plan
Requirements 1-4 are addressed in the first section of this SIP submittal as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP submittal and the modeling demonstration shows that the Logan, UT-ID area continues to attain the NAAQS out to 2035, with an intermediate year check in 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

The Board proposed this SIP subsection for public comment on September 4, 2019. A 30-day public comment period was held through the month of October. Comments were received and have been summarized and responded to in Attachment B of this memorandum. Comments were minimal and did not prompt any substantive changes to the SIP subsection. In addition to the few typographical changes, there were minor changes made to the plan as data and modeling were verified.

In addition to the response to comments, there were a few minor changes made to the plan as data and modeling were verified.

**Recommendation:** Staff recommends that the Board adopt SIP Subsection IX.A.27: PM$_{2.5}$ Maintenance Provisions for Provo, UT, as amended.

**Attachment A:** Amended SIP Subsection SIP Subsection IX.A.27: PM$_{2.5}$ Maintenance Provisions for Provo, UT.

**Attachment B:** Response to Comments Received During the SIP Subsection IX.A.27 Comment Period
PM$_{2.5}$ Maintenance Provisions for the Provo, UT Nonattainment Area

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List of Acronyms and Abbreviations

BACM   Best Available Control Measure
BACT   Best Available Control Technology
CAA    Clean Air Act
CDD    Clean Data Determination
CFR    Code of Federal Regulations
CAMx   Comprehensive Air Quality Model with Extensions
DAQ    Utah Division of Air Quality (also UDAQ)
EPA    Environmental Protection Agency
FR     Federal Register
MOVES  Motor Vehicle Emission Simulator
MPO    Metropolitan Planning Organization
MVEB   Motor Vehicle Emissions Budget
μg/m³  Micrograms Per Cubic Meter
Micron One Millionth of a Meter
NAAQS  National Ambient Air Quality Standards
NH₃    Ammonia
NOₓ    Nitrogen Oxides
NNSR   Nonattainment New Source Review
PM     Particulate Matter
PM₁₀   Particulate Matter Smaller Than 10 Microns in Diameter
PM₂.₅  Particulate Matter Smaller Than 2.5 Microns in Diameter
R-307  Utah Administrative Code Air Quality Rules
Provo NAA Provo Nonattainment Area
RACM   Reasonably Available Control Measures
RACT   Reasonably Available Control Technology
RFP    Reasonable Further Progress
SIP    State Implementation Plan
SMAT   Software for Model Attainment Test
SMOKE  Sparse Matrix Operator Kernal Emissions
SO₂    Sulfur Dioxide
SOₓ    Sulfur Oxides
TPY    Tons Per Year
TSD    Technical Support Document
UAC    Utah Administrative Code
UT     Utah
VMT    Vehicle Miles Travelled
VOC    Volatile Organic Compounds
WRF    Weather Research and Forecasting
Section IX.A.27
PM\textsubscript{2.5} Maintenance Provisions for the Provo, UT Nonattainment Area

IX.A.27.a Introduction

The Provo Nonattainment Area (Provo NAA) has attained the 2006 PM\textsubscript{2.5} 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the Provo NAA is eligible for redesignation to attainment. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the state has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.27.b, the Provo NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA’s approval of the Provo NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.27.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the Provo NAA will continue to maintain the 24-hr PM\textsubscript{2.5} NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA’s approval of the maintenance plan, the State is requesting that the Provo NAA be redesignated to attainment for the 2006 PM\textsubscript{2.5} 24-hour NAAQS.\footnote{Concurrent with the State’s submittal of SIP Section IX.A.27 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the Provo NAA to attainment.}

1) Background

In October of 2006, EPA revised the 1997 NAAQS for PM\textsubscript{2.5}. While the annual standard remained unchanged at 15 µg /m\textsuperscript{3} until 2012, the 24-hr standard was lowered from 65 µg /m\textsuperscript{3} to 35 µg /m\textsuperscript{3}. The Utah Division of Air Quality (UDAQ) has monitored PM\textsubscript{2.5} since 2000 and found that all areas have complied with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg /m\textsuperscript{3}, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the Provo NAA as nonattainment for the 2006 24-hour PM\textsubscript{2.5} NAAQS under the Act’s general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM\textsubscript{10} nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to PM\textsubscript{2.5} nonattainment areas. These provisions require EPA to classify a PM nonattainment area as “moderate” at the time it is designated nonattainment. If the area cannot attain the NAAQS by the attainment date, then EPA is required to
reclassify the area as “serious.” On June 2, 2014, the EPA classified the Provo NAA as a moderate nonattainment area with an attainment date of December 31, 2015.

The Act requires areas failing to meet the federal ambient PM$_{2.5}$ standard to develop a SIP with sufficient control requirements to expeditiously attain and maintain the standard. On December 22, 2014, UDAQ submitted a moderate area nonattainment SIP for the Provo NAA. The modeled attainment demonstration underlying the moderate SIP assessed the likelihood of attainment by the applicable attainment date of December 31, 2015 and concluded that it would be impracticable to do so.

After reaching the statutory attainment date, the EPA was compelled to determine whether the area had or had not achieved compliance with the standard by evaluating the prior three years of quality assured data. On May 10, 2017, EPA determined that the Provo NAA did not reach attainment of the 2006 24-hour standard by the attainment date (89 FR 21711). EPA subsequently reclassified the Provo NAA from a moderate PM$_{2.5}$ nonattainment area to a serious PM$_{2.5}$ nonattainment area on June 9, 2017.

Under Subpart 4 of the Act, serious PM nonattainment areas require, in addition to the provisions submitted to meet the moderate area planning requirements, the submittal of a SIP revision that: 1) provides for attainment of the applicable NAAQS no later than the end of the 10th calendar year after the area’s designation as nonattainment (December 31, 2019, for the Provo NAA), and 2) includes provisions to assure that the best available control measures (BACM) for the control of PM$_{2.5}$ and its precursors shall be implemented no later than four years after the date the area is re-classified as a serious area (June 9, 2021, for the Provo NAA). To fulfill the subpart 4 requirements, UDAQ submitted serious SIP elements to EPA on February 4, 2019, including BACM analysis. SIP approval is discussed in more detail in IX.A.27.b(2).

The statutory attainment date for the Provo NAA is December 31, 2019. Under the 24-hour PM$_{2.5}$ NAAQS, compliance is determined by the average of three years of 98th percentile values. On April 10, 2019 (84 FR 14267), the EPA published a final determination that based on the validated data from 2015-2017, the Provo, UT nonattainment area attained the 2006 primary and secondary 24-hour PM$_{2.5}$ NAAQS.

The purpose of this SIP submittal is to demonstrate that the Provo NAA is eligible for redesignation to attainment (IX.A.27.b) and document a ten-year maintenance plan (IX.A.27.c).

**IX.A.27.b Redesignation Requirements**

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment status. Table IX.A.27.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.27.c below.

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Table IX.A.27.1 Prerequisites to Redesignation in the Federal Clean Air Act

1. **(1) The Area Has Attained the PM$_{2.5}$ NAAQS**

   CAA 107(d)(3)(E)(i) – *The Administrator determines that the area has attained the national ambient air quality standard.* To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA’s guidance$^3$ concerning area redesignations, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling.

   Each component will be addressed in turn.

   a) **Ambient Air Quality Data (Monitoring) and Utah’s Monitoring Network**

   The NAAQS for PM$_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter ($\mu g/m^3$) for a 24-hour period and is met when the 98$^{th}$ percentile 24-hr concentration is less than or equal to 35 $\mu g/m^3$. Each year’s 98$^{th}$ percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating PM$_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr PM$_{2.5}$ standard is met when a three-year average of 98$^{th}$ percentile values is less than or equal to 35 $\mu g/m^3$.

   PM$_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 PM$_{2.5}$ NAAQS. UDAQ’s monitors are appropriately located to assess concentration, trends, and changes in PM$_{2.5}$ concentrations. During Utah’s wintertime temperature inversions, daily sampling and real time monitoring are necessary for both public notification and to provide data for the air quality models.

   The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.27.1 on the following

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$^3$ John Calcagni. September 4, 1992. EPA Memorandum “Procedures for Processing Requests to Redesignate Areas to Attainment.”
page shows the location of sites along the Wasatch Front and in the Cache Valley that collect PM$_{2.5}$ data. The ambient air quality monitoring network along Utah’s Wasatch Front and in the Cache Valley is routinely audited by the EPA, and meets the agency’s requirements for air monitoring networks.

Figure IX.A.27. Utah's PM$_{2.5}$ Air Monitoring Network
Table IX.A.27.2 below shows the 98th percentile values in µg/m³ for 2015, 2016, and 2017 as well as the three-year average of these values. The three-year average, or design value from 2015-2017 was used by EPA in their final clean data determination for the Provo NAA (84 FR 14267).

<table>
<thead>
<tr>
<th>Location</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>3-Year Average of 98th percentiles</th>
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<tr>
<td>North Provo</td>
<td>25.0</td>
<td>36.6</td>
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<td>Lindon</td>
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<td>Spanish Fork</td>
<td>28.1</td>
<td>29.2</td>
<td>27.6</td>
<td>28.3</td>
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**Table IX.A.27.2 Monitored Ambient 24-hr PM_{2.5} Data**

### i. Modeling Element

EPA guidance concerning redesignation requests and maintenance plans discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The Provo NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The Provo NAA clean data determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the PM_{2.5} NAAQS through the year 2035 (see section IX.A.27.c).

### ii. EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the Provo NAA is attaining the 24-hr PM_{2.5} NAAQS. On April 10, 2019, EPA published notice in the Federal Register (84 FR 14267) that pursuant to CAA section 199(b)(2), “the EPA is finalizing a clean data determination (CDD) for the 2006 24-hour fine particulate matter (PM_{2.5}) Provo, Utah (UT) nonattainment area (NAA).” This determination was based on quality-assured, quality-controlled and validated ambient air monitoring data for 2015-2017.

**b) Fully Approved Attainment Plan for PM_{2.5}**

*CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).*

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area’s approved attainment date, are eligible for reduced regulatory requirements as described in EPA’s “Clean Data Policy.” Under the Clean Data Policy, the EPA issued a clean data determination on April 10, 2019 (84 FR 14267) for the Provo NAA. The approval status of both the moderate and serious Provo SIPs is dependent on the clean data determination requirements as detailed in 81 CFR 51.1015.

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4 Ibid
a serious PM$_{2.5}$ nonattainment area, a clean data determination suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the PM$_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the serious nonattainment area by a future date to be determined by the EPA. Table IX.A.27.3 details the EPA SIP approval status.

On February 4, 2019, Utah submitted the required serious SIP elements for the Provo NAA. Additionally, EPA guidance$^6$ states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.27.3 that show pending approval may fall into this category.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>EPA Action &amp; Date</th>
<th>FR Citation</th>
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<tr>
<td>Base Year and Projection Year</td>
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<td>Emission Inventories</td>
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<td>Modeled Attainment Demonstration</td>
<td>Clean Data Determination</td>
<td>84 FR 14267</td>
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<td>4/10/2019</td>
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<tr>
<td>BACT</td>
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<tr>
<td>On-Road Mobile BACM</td>
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<td>--</td>
</tr>
<tr>
<td>Non-Road Mobile BACM</td>
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<tr>
<td>Area Source BACM</td>
<td>See Table IX.A.27.4</td>
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<tr>
<td>MVEB</td>
<td>Clean Data Determination</td>
<td>84 FR 14267</td>
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<tr>
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<td>4/10/2019</td>
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<tr>
<td>Nonattainment New Source Review (R307-403)</td>
<td>Approved on 7/25/2019</td>
<td>84 FR 35832</td>
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<tr>
<td>Reasonable Further Progress</td>
<td>Clean Data Determination</td>
<td>84 FR 14267</td>
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<td>Contingency Measures</td>
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<td>84 FR 14267</td>
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<td>4/10/2019</td>
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Table IX.A.27.3 Provo, UT Serious SIP Approval Status

The SIP elements still required under the clean data policy$^7$ include emission inventories, NNSR requirements, and BACM/BACT. The EPA approved R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas on July 25, 2019 (84 FR 35832), which covers the NNSR requirement for the PM$_{2.5}$ attainment plans. The State has submitted the emission inventories, and BACM/BACT elements to the EPA, including the R307-300 series amendments and the point source

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$^6$ Calcagni (n 3)

BACT emission limitation and operating practices (Utah SIP Section IX.H). These SIP elements are still pending EPA approval.

While many of the moderate and serious SIP elements are suspended under the clean data determination, many of the moderate SIP element have been approved. As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control PM$_{2.5}$ and PM$_{2.5}$ precursors. On February 25, 2016 (81 FR 9343), and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and reasonably available control measure (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.27.4 for details on rules, approval dates, and implementation schedules. For the SLC and Provo NAAs, the BACM analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities.

<table>
<thead>
<tr>
<th>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs</th>
<th>Implementation Schedule</th>
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<tr>
<td>R307-302 Solid Fuel Burning Devices</td>
<td>February 1, 2017</td>
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<td>EPA conditionally approved* October 19, 2016 (81 FR 71988).</td>
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<tr>
<td>EPA approved February 25, 2016 (81 FR 9343).</td>
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<tr>
<td>R307-304 Solvent Cleaning</td>
<td>December 6, 2017</td>
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<td>R307-307 Road Salting and Sanding</td>
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<td>EPA approved February 25, 2016 (81 FR 9343).</td>
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<tr>
<td>R307-309 Nonattainment and Maintenance Areas for PM$<em>{10}$ and PM$</em>{2.5}$: Fugitive Emissions and Fugitive Dust</td>
<td>Salt Lake County, Utah County, and the City of Ogden – January 1, 2013. Remaining NAAs – April 1, 2013.</td>
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<tr>
<td>EPA proposed for approval September 14, 2017 (82 FR 43205).</td>
<td>Amended August 4, 2017</td>
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<td>R307-312 Aggregate Processing Operations for PM$_{2.5}$ Nonattainment Areas.</td>
<td>February 4, 2016</td>
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</table>
| R307-335 Degreasing and Solvent Cleaning Operations *1*  
All other sources defined in R307-335-2 – September 1, 2013.  
All sources within Box Elder, Cache, Utah, Weber, and Tooele Counties R307-335-7 – August 1, 2014  
Amended October 29, 2017, by removing sections 6 & 7 to for rule R307-304 |
| R307-342 Adhesives & Sealants *1*  
EPA approved February 25, 2016 (81 FR 9343). | December 1, 2014 |
| R307-343 Emissions Standards for Wood Furniture Manufacturing Operations *1*  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – September 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-344 Paper, Film & Foil Coatings *1*  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-345 Fabric & Vinyl Coatings *1*  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2011.  
Amended December 6, 2017 |
| R307-346 Metal Furniture Surface Coatings *2*  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-347 Large Appliance Surface Coatings *2*  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |

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<table>
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<th>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs</th>
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| R307-348 Magnet Wire Coatings $^2$  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-349 Flat Wood Panel Coatings $^1$  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-350 Miscellaneous Metal Parts and Products Coatings $^1$  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – September 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-351 Graphic Arts $^1$  
EPA approved February 25, 2016 (81 FR 9343) | Sources in Salt Lake and Davis Counties – February 1, 2013.  
Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014.  
Amended December 6, 2017 |
| R307-352 Metal Containers, Closure, and Coil Coatings $^2$  
EPA approved February 25, 2016 (81 FR 9343) | January 1, 2014  
Amended December 6, 2017 |
| R307-353 Plastic Parts Coatings $^1$  
EPA approved February 25, 2016 (81 FR 9343) | January 1, 2014  
Amended December 6, 2017 |
| R307-354 Automotive Refinishing Coatings $^1$  
EPA approved February 25, 2016 (81 FR 9343) | January 1, 2014  
Amended December 6, 2017 |
| R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities $^1$  
EPA approved February 25, 2016 (81 FR 9343) | January 1, 2014  
Amended March 8, 2018 |
| R307-356 Appliance Pilot Light $^1$  
EPA approved February 25, 2016 (81 FR 9343) | January 1, 2013 |

Section IX.A.27
Table IX.A.27. 4 Area Source Rules Implementation Schedule and EPA Approval Status

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<td>R307-361 Architectural Coatings</td>
<td>October 31, 2013</td>
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The clean data determination has suspended all other elements of the Provo NAA PM$_{2.5}$ attainment plan, including reasonable further progress (RFP) plans, quantitative milestones, and contingency measures at this time. Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the Provo NAA.

c) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions

CAA 107(d)(3)(E)(iii) - The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions. Speaking further on the issue, EPA guidance reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

i. Improvement in Air Quality

The improvement in air quality with respect to PM$_{2.5}$ can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the Provo NAA, these control strategies were implemented as the result of both the moderate SIP and the serious designation BACM/BACT requirements, submitted to EPA in December 2014 and February 2019, respectively. The various control measure effective dates are detailed in Tables IX.A.27.4 and IX.A.27.5.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored PM$_{2.5}$ (see Figure IX.A.27.2 and Figure IX.A.27.3). The Provo NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98th percentile average of 24-hr data as well as the annual arithmetic mean to understand trends (see Figure IX.A.27.2).
Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary PM$_{2.5}$. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the PM$_{2.5}$ concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct PM$_{2.5}$ and PM$_{2.5}$ precursors. This variability is apparent in Figure IX.A.27.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of a little less than one µg/m$^3$ per year.

This episodic variability is reduced by looking at annual mean values of PM$_{2.5}$ concentrations shown in Figure IX.A.27.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98th percentiles, as well as the values ranked even higher. Still, the trend is downward. Fitting a line through the data collected at the Lindon site (chosen because the monitor consistently records the highest values in the NAA) reveals a trend that noticeably decreases and indicates an improvement of approximately 3.0 µg/m$^3$, over the 18-year span.
ii. Reduction in Emissions

As stated above, EPA guidance\(^9\) says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State

\(^9\) Ibid
should estimate the percent reduction (from the year that was used to determine the design value) achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.27.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the Provo NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the Provo NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date. As defined in CAA Section 171(1), the term reasonable further progress means “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.” Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

The RACM prescribed by the moderate nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the Provo NAA to EPA on March 23, 2018, within the 90 day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating “The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the enclosures. This determination is based on the EPA’s review of information contained in the Moderate Area Plans and additional information provided in the 2017 Quantitative Milestone Reports.” This approval letter is included in the TSD for this SIP submittal. Much of the downward trend in the ambient data as seen in Figures IX.A.27.2 and IX.A.27.3 is attributable to the controls implemented through the moderate SIP.

40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date, January 1, 2019, for the Provo NAA. Any control measures implemented beyond such date are instead regarded as additional feasible measures. Implementation schedules for point source control measures are included in Table IX.A.27.5. Emission reductions leading to lower ambient values can be observed in Figures IX.A.27.2 and IX.A.27.3, with further improvements expected beyond 2019 as a result of the more stringent BACM/BACT requirements.

<table>
<thead>
<tr>
<th>Company</th>
<th>RACT Equipment Updates</th>
<th>BACT Requirements</th>
<th>Implementation Schedule</th>
<th>Quantity Reduction (tons/yr)</th>
<th>Compliance Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>PacifiCorp</td>
<td>N/A (currently at RACT)</td>
<td>Retention of NOx limits from existing permit:</td>
<td>Already Implementing (use of SCR)</td>
<td>N/A identical to previous existing RACT</td>
<td>NOx CEM</td>
</tr>
<tr>
<td>Lake Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section IX.A.27
As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control PM$_{2.5}$ and PM$_{2.5}$ precursors. For the serious SIP area source BACM review, each of UDAQ’s existing area source rules were re-evaluated to ensure that all appropriate source categories were addressed in rulemaking and that the level of control required is consistent with BACM. For newly identified controls or enhancement of existing controls, an evaluation was made to determine technological and economic feasibility. The BACM review resulted in revisions to 13 different area source rules which affect surface coating (for a variety of different surfaces), graphic arts, and aerospace manufacture & rework facilities. The rules and amendments are listed in Table IX.A.27.4. Table IX.A.27.6 shows the effectiveness of the area source rules within Provo NAA.
### 2017 PROVO NAA lb/day

<table>
<thead>
<tr>
<th>Area Source Rule Name</th>
<th>NOX</th>
<th>VOC</th>
<th>NH3</th>
<th>SO2</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-342 adhesive/sealants</td>
<td>0.0</td>
<td>393.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-355 aerospace manufacture &amp; rework</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-312 aggregate processing</td>
<td>0.0</td>
<td>22.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-347 appliance surface coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-354 automotive refinishing</td>
<td>0.0</td>
<td>154.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-352 metal container, closure, &amp; coil coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-303 commercial cooking</td>
<td>0.0</td>
<td>282.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-357 consumer products</td>
<td>0.0</td>
<td>1478.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-335 degreasing &amp; solvent cleaning</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-349 flat wood panel coatings</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-309 fugitive dust</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>916.3</td>
</tr>
<tr>
<td>R307-351 graphic arts</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-208 outdoor wood boilers</td>
<td>3.4</td>
<td>111.4</td>
<td>2.8</td>
<td>3.4</td>
<td>105.8</td>
</tr>
<tr>
<td>R307-221 landfill controls</td>
<td>0.0</td>
<td>63.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-348 magnet wire coatings</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-346 metal furniture surface coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-350 misc metal parts &amp; product coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-361 architectural coating</td>
<td>0.0</td>
<td>2178.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-344 paper/film/foil coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-356 appliance pilot light</td>
<td>494.3</td>
<td>28.9</td>
<td>0.0</td>
<td>3.2</td>
<td>2.3</td>
</tr>
<tr>
<td>R307-353 plastic parts coating</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-302 residential wood burning ban</td>
<td>321.7</td>
<td>2659.7</td>
<td>100.0</td>
<td>38.0</td>
<td>2330.4</td>
</tr>
<tr>
<td>R307-230 water heaters</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R307-343 wood furniture manufacturing</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total emissions reduced lb/day</strong></td>
<td>819.4</td>
<td>7373.5</td>
<td>102.8</td>
<td>44.6</td>
<td>3354.8</td>
</tr>
</tbody>
</table>
In reality, the NAAs should expect to see continued improvement in the next five to ten years as a result of the phase-in period of a number of the area source rules and some additional feasible measures installed at point sources. For example, the gas-fired water heater rule R307-230 requires that only ultra-low NOx gas-fired water heaters to be sold or installed after July 1, 2018, but it takes years for water heater turnover to occur. In addition, the 13 rules that were revised during the serious SIP BACM review were implemented at the state level in 2018 and have a five-year phase-in period, resulting in full emission reduction by 2023. Therefore, additional emissions reductions will be seen. These phase-in periods were considered in the inventories used for modeling in this SIP.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce PM$_{2.5}$. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales).

For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies gasoline to the Wasatch Front market, are considered small refineries by EPA’s rule. As such, these

### Table IX.A.27. 6 Area Source Rule Emissions Reduction in Provo NAA

<table>
<thead>
<tr>
<th>Area Source Rule Name</th>
<th>NOX</th>
<th>VOC</th>
<th>NH3</th>
<th>SO2</th>
<th>PM$_{2.5}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-342 adhesive/sealants</td>
<td>0.00</td>
<td>608.95</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-355 aerospace manufacture &amp; rework</td>
<td>0.00</td>
<td>0.22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-312 aggregate processing</td>
<td>0.00</td>
<td>23.49</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-347 appliance surface coating</td>
<td>0.00</td>
<td>48.12</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-354 automotive refinishing</td>
<td>0.00</td>
<td>479.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-352 metal container, closure, &amp; coil coating</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-303 commercial cooking</td>
<td>0.00</td>
<td>18.23</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-357 consumer products</td>
<td>0.00</td>
<td>1829.57</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-335 degreasing &amp; solvent cleaning</td>
<td>0.00</td>
<td>483.36</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-349 flat wood panel coatings</td>
<td>0.00</td>
<td>16.68</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-309 fugitive dust</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1118.72</td>
</tr>
<tr>
<td>R307-351 graphic arts</td>
<td>0.00</td>
<td>315.66</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-208 outdoor wood boilers</td>
<td>3.20</td>
<td>108.40</td>
<td>2.80</td>
<td>3.20</td>
<td>103.00</td>
</tr>
<tr>
<td>R307-221 landfill controls</td>
<td>0.00</td>
<td>78.17</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-348 magnet wire coatings</td>
<td>0.00</td>
<td>0.31</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-346 metal furniture surface coating</td>
<td>0.00</td>
<td>99.92</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-350 misc metal parts &amp; product coating</td>
<td>0.00</td>
<td>64.83</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-361 architectural coating</td>
<td>0.00</td>
<td>2696.22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-344 paper/film/foil coating</td>
<td>0.00</td>
<td>350.49</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-356 appliance pilot light</td>
<td>2992.74</td>
<td>139.35</td>
<td>0.00</td>
<td>15.20</td>
<td>10.89</td>
</tr>
<tr>
<td>R307-353 plastic parts coating</td>
<td>0.00</td>
<td>125.97</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-302 residential wood burning ban</td>
<td>312.68</td>
<td>2589.01</td>
<td>98.03</td>
<td>36.62</td>
<td>2268.45</td>
</tr>
<tr>
<td>R307-230 water heaters</td>
<td>2620.83</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>R307-343 wood furniture manufacturing</td>
<td>0.00</td>
<td>408.39</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total emissions reduced lb/day</strong></td>
<td><strong>5929.4</strong></td>
<td><strong>10484.4</strong></td>
<td><strong>100.8</strong></td>
<td><strong>55.0</strong></td>
<td><strong>3501.1</strong></td>
</tr>
</tbody>
</table>
refineries have a tier 3 delayed implementation date of January 1, 2020 to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

To supplement the federal motor vehicle control program, an Inspection and Maintenance Program was implemented in Utah County. This program has been effective in identifying vehicles that no longer meet the emission standards[ specifications] for their respective makes and models and in ensuring that those vehicles are repaired in a timely manner.

Emissions from non-road mobile emission sources also benefit from several significant regulatory programs enacted at the federal level. This category of emitters includes airplanes, locomotives, hand-held engines, and larger portable engines such as generators and construction equipment. The effectiveness of these controls has been incorporated into the “NONROAD” model UDAQ uses to compile the inventory information for this source category.

The emissions reductions resulting from federal programs and the RACM/RACT plus BACM/BACT controls incorporated into the Utah SIP or promulgated at the State level, result in emissions reductions that are consistent with the notion of permanent and enforceable improvements in air quality. Taken together with the trends in ambient air quality illustrated in the previous paragraph, along with the continued implementation of the nonattainment SIP elements for the Provo NAA, they provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.

d) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to PM$_{2.5}$.

i. Section 110

The State has met all requirements applicable to the Provo NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 PM$_{2.5}$ NAAQS. EPA approved the State’s Infrastructure SIP on November 25, 2013 (78 FR 63883) for all Section 110 requirements that are applicable to redesignation.

ii. Part D Subpart 1 and 4

Part D of the Act addresses “Plan Requirements for Nonattainment Areas.” Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an...
attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA’s issuance of a final clean data determination demonstrating that the Provo NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review (“NNSR”) program, emissions inventory submission, and implementation of BACM/BACT. The State has satisfied these remaining requirements. Utah’s NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The BACM/BACT requirements and the emissions inventory were included in the serious SIP element submittal for the Provo NAA that the State submitted to the EPA on February 4, 2019. Upon EPA’s approval of these elements prior to or concurrently with EPA’s action on the maintenance plan/redesignation request, Utah will have complied with all applicable Part D requirements.

e) Maintenance Plan for PM2.5 Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.

IX.A.27.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Reference</th>
<th>Addressed in Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance demonstration</td>
<td>Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.</td>
<td>CAA: 175A(a)</td>
<td>IX.A.27.c (1)</td>
</tr>
<tr>
<td>Revise in 8 Years</td>
<td>The State must submit an additional revision to the plan, 8 years after</td>
<td>CAA: 175A(b)</td>
<td>IX.A.27.c (6)</td>
</tr>
</tbody>
</table>

Calcagni (n 3)
redesignation, showing an additional 10 years of maintenance.

Continued Implementation of Nonattainment Area Control Strategy

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.</td>
</tr>
<tr>
<td>CAA: 175A(c), 110(l), Calcagni memo</td>
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<tr>
<td>IX.A.27.c (5)</td>
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Continuing Implementation of Nonattainment Area Control Strategy

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.</td>
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<tr>
<td>CAA: Sec 175A(d)</td>
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<td>IX.A.27.c (8)</td>
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Verification of Continued Maintenance

<table>
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<tr>
<td>The maintenance plan must indicate how the State will track the progress of the maintenance plan.</td>
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<tr>
<td>Calcagni memo</td>
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<td>IX.A.27.c (7)</td>
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Table IX.A.27. 7 CAA Maintenance Plan Requirements

(1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

(a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah’s NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient PM2.5 during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

11 Ibid
(b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

i. Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5. SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly and hourly values.
- Spatial: Convert emissions from a county-wide average to gridded emissions.
- Speciation: Decompose PM$_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct PM$_{2.5}$ and PM$_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA’s 2011v6 modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse for Inventories and Emissions Factors (CHIEF) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

ii. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.27.4). This configuration allows one to efficiently integrate regional effects with local impacts within the Provo NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.
iii. Meteorological Data

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ.

Meteorological inputs were derived using the Weather Research and Forecasting\(^\text{15}\) (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions.

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\(^{15}\) https://www.mmm.ucar.edu/weather-research-and-forecasting-model
conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSDs.

iv. Episode Selection

Part of the modeling exercise involves a test to see whether the model can successfully replicate the PM$_{2.5}$ mass and composition that was observed during prior episode(s) of elevated PM$_{2.5}$ concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance$^{16}$ identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated PM$_{2.5}$.
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah’s SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour PM$_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

$^{16}$ Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM$_{2.5}$, and Regional Haze.

Section IX.A.27
Previous work conducted by the University of Utah and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model\(^\text{17}\). A comprehensive discussion of the meteorological model performance for all three episodes may be found in the Technical Support Document for the meteorological modeling\(^\text{18}\).

### a) Model Adjustments and Settings

In order to better simulate Utah’s winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (\(K_{vpatch}\)).
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high PM\(_{2.5}\) days (burn ban).
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry).
4. Cloud water content reduced during certain days (cloud adjustment).
5. \(N\text{H}_3\) injection to account for missing \(N\text{H}_3\) sources in UDAQ’s inventory. This is defined as artificially adding non-inventoried \(N\text{H}_3\) emissions to the inventoried emissions that are input into CAMx.
6. Reduced the dry deposition rate of \(N\text{H}_3\) by setting \(N\text{H}_3\) Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
7. Applied a 93% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

\(K_{vpatch}\) improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

Cloud adjustments were only applied to the January 2011 episode, which was characterized by cloud cover on January 6-8 over the Salt Lake and Utah valleys. This cloud cover led to a high bias in sulfate due to the effect of \(N\text{H}_3\) on the gas-to-particle partitioning of sulfate in clouds. Application of the cloud adjustment scheme helped reduce this bias.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The burn ban adjustments reflect the compliance rate with the state’s two-stage policy ban on wood-burning.

A 93% reduction in paved road dust emissions was only applied to the January 2011 emissions. This adjustment helped improve the model performance for crustal material.

\(^\text{17}\) [https://www.mmm.ucar.edu/weather-research-and-forecasting-model](https://www.mmm.ucar.edu/weather-research-and-forecasting-model)

b) Episodic Model Performance

Shown below for each of three episodes are the CAMx performance results for total 24-hour PM$_{2.5}$ mass and PM$_{2.5}$ chemical species, including nitrate (NO$_3$), sulfate (SO$_4$), ammonium (NH$_4$), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass).

January 1-10, 2011

A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011 at the Lindon monitoring station in the Provo NAA showed that overall the model captures the temporal variation in PM$_{2.5}$ well (Figure IX.A.27.5). The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. Moreover, with the exception of January 3-5, the bias between measured and modeled PM$_{2.5}$ is overall relatively small, particularly on PM$_{2.5}$ exceedance days. The large bias on January 3-5 can be mainly related to the meteorological model performance on these days where jet wind speeds were overestimated in the WRF model$^{19}$.

![Figure IX.A.27. 5 Measured and Modeled 24-hr PM$_{2.5}$ Concentrations During January 1-10 2011 at Lindon Monitoring Station in Provo NAA](https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf)

The model performance for PM$_{2.5}$ chemical species was also good for this episode as indicated by a comparison of measured and modeled PM$_{2.5}$ chemical composition at the Lindon monitoring station on January 7, which corresponds to a PM$_{2.5}$ exceedance day. The model performance for particulate nitrate, which is the major component of PM$_{2.5}$, was good, with both modeled and measured NO$_3$ accounting for similar contributions to PM$_{2.5}$ filter mass. Modeled and observed nitrate concentrations were also in close agreement, accounting for 22.6 and 23.5 µg/m$^3$ of PM$_{2.5}$ mass, respectively.

The model, on the other hand, was biased low for NH$_4$ by about 41%. The model performance for particulate sulfate was good, with sulfate being biased low in the model by about 20%. The model performance for OC and EC was also reasonably good for January 7, with modeled concentrations being biased by approximately 20%. The model was biased high for CM by approximately 70%. Additional detail can be found in the TSD.

[on a PM$_{2.5}$ exceedance day (Figure IX.A.27.6). Given that measurements of PM$_{2.5}$ chemical species were not available for a PM$_{2.5}$ exceedance day during the January 1–10, 2011, modeling episode, this analysis is based on a comparison of the fraction of individual PM$_{2.5}$ chemical species in total PM$_{2.5}$ mass between 2011 model outputs and measurements from 2013. Measurements correspond to filter speciation data collected at Lindon during a typical winter-time inversion event in 2013.]
Figure IX.A.27. 6 a) Measured and b) Modeled [Species Contribution (in %)] to Chemical Composition of PM$_{2.5}$ at Lindon Monitoring Station in the Provo NAA on January 7, 2011 [Typical 24-hr PM$_{2.5}$ Exceedance Day]
As can be seen, the chemical composition of modeled PM$_{2.5}$ is similar to that of measured PM$_{2.5}$, with modeled secondary species, NO$_3$, NH$_4$, and SO$_4$, accounting for over 50% of PM$_{2.5}$ mass, in agreement with measurements. The model also performed reasonably well for OC while it overestimated the percent contributions of EC and crustal material to PM$_{2.5}$ by 20% and 70%, respectively. This overprediction could be related to an overestimation in source emissions. Speciation measurements specific to this episode are needed for further confirmation.

Overall, the model simulated well the timing and strength of the capping inversion during this January episode. PM$_{2.5}$ chemical species, particularly NO$_3$ and NH$_4$, are also well simulated in the model, suggesting that this episode is suitable for modeling.

December 7-19, 2013

The model performance for the December 7-19, 2013, episode was first evaluated for 24-hr PM$_{2.5}$ mass. A comparison of modeled and measured 24-hr PM$_{2.5}$ during this period showed that, while the model generally represented well the temporal variation in PM$_{2.5}$, the model simulated low PM$_{2.5}$ concentrations compared to measurements (Figure IX.A.27.7). This is likely related to a warm model temperature bias in the Utah Valley between December 10-14 due to inadequate simulation of stratus cloud formation during December 12-14 and inadequate representation of the surface of the Utah Lake. Although frozen in reality during this December episode, the surface of the Utah lake was not represented as frozen in the model.

![Figure IX.A.27.7 Measured and Modeled 24-hr PM$_{2.5}$ Concentrations During December 7-19, 2013, at Lindon Monitoring Station in the Provo NAA](https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf)

* Federal Reference Monitor (FRM) data is missing for this day. Reported measurement corresponds to data collected with a continuous PM$_{2.5}$ instrument.

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[20](https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf)
To further evaluate the model performance during this episode, modeled and measured PM$_{2.5}$ chemical species on December 12, which corresponds to a PM$_{2.5}$ exceedance day with available speciation measurements, were compared (Figure IX.A.27.8). NO$_3$, NH$_4$, and OC are all underpredicted in the model, which is possibly related to the meteorological model performance. The WRF model overpredicted surface temperatures, leading to increased mixing and therefore reduction in concentrations. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied for the December 2013 simulations.

Given that the strength of the capping inversion was not well simulated in the meteorological model, selection of the December 2013 episode as modeling episode for modeling demonstration is not desirable.

Figure IX.A.27. 8 a) Measured and b) Modeled Chemical Composition of 24-hr PM$_{2.5}$ in µg/m$^3$ and % of PM$_{2.5}$ at Lindon Monitoring Station in Provo NAA on December 12, 2013

February 1-16, 2016

A comparison of modeled and measured 24-hr PM$_{2.5}$ at the Lindon monitoring station in the Provo NAA during February 1-16, 2016 showed that peak PM$_{2.5}$ concentrations are not well simulated in the model...
The increase in PM$_{2.5}$ is not well represented in the model, with PM$_{2.5}$ concentrations building up then dropping prematurely in the model. The model also failed at capturing the observed PM$_{2.5}$ peak on February 14. These results can be attributed to the meteorological model performance. A warm modeled temperature bias in the Utah Valley due to early snow melt-out in the model as well as premature dissipation of simulated clouds likely contributed to increased mixing and early dispersion of PM$_{2.5}$ in the model$^{21}$.

![Figure IX.A.27.9](https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf)

**Figure IX.A.27. 9 Measured and Modeled 24-hr PM$_{2.5}$ Concentrations During February 1-16, 2016 at Lindon Monitoring Station in the Provo NAA. FRM data was missing for all episode days. Reported measurements correspond to data collected with a continuous PM$_{2.5}$ instrument.**

The model performance for this episode was further assessed for PM$_{2.5}$ bulk chemical species on February 12, which corresponds to a PM$_{2.5}$ exceedance day (Figure IX.A.27.10). NO$_3$, a major component of PM$_{2.5}$, was underpredicted by about 25\% in the model. Moreover, similarly to the model performance for the two other meteorological episodes, EC and crustal material were overestimated in the model. The model performance for all other species was overall acceptable.

Although the chemical composition of PM$_{2.5}$ on February 12 is overall well reproduced by the model, the timing in PM$_{2.5}$ peaks was generally poorly represented, suggesting that this episode not suitable for modeling.

Conclusion

Examining the PM$_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with an exhaustive field campaign (Persistent Cold Air Pool Study (PCAPS)$^{22}$). This was further confirmed by a linear regression analysis that showed that modeled and measured PM$_{2.5}$ at Lindon monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.89$) compared to the other episodes ($R^2 = 0.05$ and 0.81) (Figure IX.A.27.11). They also displayed a slope that is close to unity (0.87) for the January 2011 episode, further indicating their close agreement and good model performance when using the 2011 WRF output.

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$^{22}$ http://www.pcaps.utah.edu/
Figure IX.A.27. 11 Modeled vs. Measured 24-hr PM$_{2.5}$ at Lindon Monitoring Station for Each of the Three Modeling Episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode.

Given that the January 2011 WRF data produced superior model performance when compared with the other two episodes, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the TSD.
(c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support for the model modifications and settings that were applied (ammonia injection, increase of surface resistance to ammonia, zeroing-out of ozone deposition velocity, reduction of cloud-water content, snow albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more accurately reproduce winter-time inversion episodes. A detailed explanation of these model modifications is provided in the TSD.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data included 24-hr total PM$_{2.5}$ and 24-hr chemically-speciated PM$_{2.5}$ measurements collected at the Lindon monitoring station in the Provo NAA. The evaluation was based on the December 31-January 10, 2011, episode and the 2011 emissions inventory were used as input data for the model simulations. The evaluation focused on days with PM$_{2.5}$ concentration exceeding the NAAQS (> 35 µg/m$^3$). Results for December 31, which is a model spin-up day, are excluded from this evaluation.

A more detailed model performance evaluation that examines the model performance for gaseous species is provided in the TSD. More details on the model performance at various sites within the Provo NAA are also included in the TSD.

Daily PM$_{2.5}$ Concentrations

A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011, at the Lindon monitoring station in the Provo non-attainment area showed that the model overall captures the temporal variation in PM$_{2.5}$ well (Figure IX.A.27.12). The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. Moreover, the bias between measured and modeled PM$_{2.5}$ is overall relatively small, particularly on PM$_{2.5}$ exceedance days.
Figure IX.A.27. 12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hr Average PM$_{2.5}$ Concentrations During January 1-10, 2011 at Lindon Monitoring Station in the Provo NAA. Dashed Red Line is NAAQS for 24-hr PM$_{2.5}$.

PM$_{2.5}$ Chemical Speciation

The model performance was further evaluated for PM$_{2.5}$ chemical species. [Given that measurements of PM$_{2.5}$ chemical species were not available for a PM$_{2.5}$ exceedance day during the selected modeling episode, this analysis is based on a comparison of the fraction of individual PM$_{2.5}$ chemical species in total PM$_{2.5}$ mass between 2011 model outputs and 2013 measurements. The latter correspond to filter speciation data collected at Lindon during a typical winter-time inversion event in 2013. While the 2013 measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are useful to assess if the model predicts similar PM$_{2.5}$ chemical composition during strong inversion conditions. Although the concentration of individual PM$_{2.5}$ chemical species may vary between inversion events, their relative contribution to total PM$_{2.5}$ mass is expected to remain the same during typical inversion events.] Figure IX.A.27.13 shows a comparison of the bulk chemical composition of measured and modeled PM$_{2.5}$ at the Lindon monitoring station on January 7, 2011, which corresponds to a day when PM$_{2.5}$ monitored data showed a value above 35 µg/m$^3$. Chemical species, including nitrate (NO$_3$), sulfate (SO$_4$), ammonium (NH$_4$), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM), and other species (other mass), were considered in this analysis. The model performance evaluation for PM$_{2.5}$ species on non-PM$_{2.5}$ exceedance days is provided in the TSD.

The model performance for particulate NO$_3$, which is the major component of PM$_{2.5}$, was good, with both modeled and measured NO$_3$ accounting for similar contributions to PM$_{2.5}$ filter mass. Modeled and observed NO$_3$ concentrations were also in close agreement, accounting for 22.6 and 23.5 µg/m$^3$ of PM$_{2.5}$ mass, respectively. The model, on the other hand, was biased low for NH$_4$ by about 41%. The underestimation in modeled NH$_4$ can be related to an underestimation in modeled hydrochloric acid (HCl). A previous source apportionment analysis showed that ammonium chloride accounts for 10-15% of total PM$_{2.5}$ mass along the Wasatch Front during high wintertime PM$_{2.5}$ pollution episodes. The model performance for particulate sulfate was good, with sulfate being biased low in the model by about 20%. The model performance for OC and EC was also reasonably good for January 7, with modeled
concentrations being biased by approximately 20%. The model was biased high for CM by approximately 70%. Additional detail can be found in the TSD.

[Figures IX.A.27.13 shows the percent contribution of modeled and measured chemical species to PM$_{2.5}$ at Lindon monitoring station on a typical 24-hr PM$_{2.5}$ exceedance day. As can be seen, the chemical composition of modeled PM$_{2.5}$ is similar to that of measured PM$_{2.5}$. Modeled NO$_3^-$ accounts for about 50% of PM$_{2.5}$, in agreement with the contribution of measured NO$_3^-$ to PM$_{2.5}$ mass (about 49%). Measured and modeled SO$_4^{2-}$ and NH$_4^+$ also have similar fractional contributions to PM$_{2.5}$ mass. The model performance for OC was also good. On the other hand, the model overestimated the percent contributions of EC and CM to PM$_{2.5}$. This overprediction on days when the simulated atmospheric mixing was particularly strong could be related to an overestimation in source emissions. A more thorough evaluation is limited by the lack of speciation measurements for the selected modeling episode.] 

**a) Lindon December 12 2013**
- Measured PM$_{2.5}$ = 45.9 ug/m$^3$

**b) Lindon January 07 2011**
- Modeled PM$_{2.5}$ = 45.02 ug/m$^3$
Figure IX.A.27. 13 a) Measured and b) Modeled Species Contribution (in µg /m³ and %) to PM$_{2.5}$ at Lindon Monitoring Station in the Provo NAA on January 7, 2011 [during a typical 24-hr PM$_{2.5}$ exceedance day]

Summary of Model Performance

The model performance replicating the buildup and clear out of PM$_{2.5}$ is good overall. The model captures the temporal variation in PM$_{2.5}$ well. The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. The model also predicts reasonably well PM$_{2.5}$ concentration on peak days. It also overall replicates well the composition of PM$_{2.5}$ on an exceedance day, with good model performance for secondary NO$_3$ and NH$_4$ which account for over 50% of PM$_{2.5}$ mass.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is good and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach “should reduce some of the uncertainty attendant with using absolute model predictions alone.”

(d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For any given (future) year, an attainment projection is made by calculating a concentration termed the Future
Design Value (FDV). This value is calculated for each monitor included in the analysis, and then compared to the NAAQS (35 µg/m³). If the FDV at every monitor located within a NAA is less than the NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan development. To be conservative, attainment projections were made for 2035. An assessment was also made for 2026 as a “spot-check” against emission trends within the ten-year span.

**PM$_{2.5}$ Baseline Design Values**

For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the 24-hour PM$_{2.5}$ NAAQS, which is the 98th percentile value averaged over a three-year period. Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Several values were excluded when calculating the BDVs in the Provo NAA. EPA’s “Exceptional Events Rule” allows states to exclude certain air quality data due to exceptional events such as wildfires or dust storms. In the preamble to the 2016 amendments to the rule, EPA states that “the CAA also recognizes that it may not be appropriate to use the monitoring data influenced by “exceptional” events that are collected by the ambient air quality monitoring network when making certain regulatory determinations. When “exceptional” events cause exceedances or violations of the NAAQS that subsequently affect certain regulatory decisions, the normal planning and regulatory process established by the CAA may not be appropriate.”

There were two large local wildfires during the summer of 2018 that affected the ambient monitored PM$_{2.5}$ values at the Spanish Fork monitor in the Provo NAA. When including the atypical data influenced by wildfires, the baseline design value is just below the NAAQS at 35.4 µg/m³. Since the design value complies with the NAAQS, the wildfire events are not considered “exceptional events” because they did not cause exceedances or violations of the NAAQS (40 CFR 50.14). In anticipation that there would be some determinations and analyses not covered by the Exceptional Events Rules that would rely on air quality data that may have been influenced by atypical, extreme, or unrepresentative events, EPA published further guidance on the subject.

This guidance identifies the most common determinations and analyses not covered by the Exceptional Events Rule and clarifies for each of them whether there is a separate existing mechanism under which the exclusion, selection, or adjustment of air quality monitoring data may be appropriate. One example is certain modeling analyses under EPA’s Guideline on Air Quality Models Rule, including modeling analyses used for estimating base and future year design values for ozone and PM$_{2.5}$ attainment demonstrations.

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24 EPA Memorandum. Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events. April 4, 2019.
According to the Guidance, these types of modeling analyses may exclude monitoring data if the data is not representative to characterize base period concentrations which may impact a determinative value in a projected time period. This could include data used to model future year design values for demonstrating attainment.

In the case of the two Utah County fires, the ambient data recorded by the Spanish Fork monitor was atypical. It did not characterize base period concentrations, and it would impact a determinative value in the projected design value. Since this data is atypical and gives an atypical projected design value, it should be excluded from the Provo NAA’s modeling and maintenance demonstration.

As a result, this maintenance plan modeling uses a baseline design value that excludes the atypical data at the Spanish Fork monitor from the two fires. The baseline design value including the atypical data is 35.4 µg/m³. The baseline design value excluding the atypical data is 28.4 µg/m³. An extensive atypical event write-up, including back trajectory analysis using HYSPLIT, is included in the TSDs. Table IX.A.27.8 details the filtered PM₂.₅ values that are excluded.

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<tr>
<td>9/15/2018</td>
<td>42.6</td>
<td>Pole Creek and Bald Mountain</td>
</tr>
<tr>
<td>9/17/2018</td>
<td>74.5</td>
<td>Pole Creek and Bald Mountain</td>
</tr>
<tr>
<td>9/18/2018</td>
<td>57.7</td>
<td>Pole Creek and Bald Mountain</td>
</tr>
<tr>
<td>9/19/2018</td>
<td>76.3</td>
<td>Pole Creek and Bald Mountain</td>
</tr>
<tr>
<td>9/21/2018</td>
<td>39.3</td>
<td>Pole Creek and Bald Mountain</td>
</tr>
</tbody>
</table>

Table IX.A.27.8 Atypical Event Values Excluded from Baseline Design Value at the Spanish Fork Monitor

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan is 2017. This comparison results in a Relative Response Factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01 utility from EPA²⁵ to perform the modeled attainment test for daily PM₂.₅. SMAT is designed to

²⁵ https://www.epa.gov/scram/photochemical-modeling-tools
interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to
the FRM monitors. It also calculates the RRF for grid cells near each monitor and uses these to calculate
a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was
used as the boundary for relative response factor (RRF) calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful,
and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and
the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of
days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were
unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the
CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA.
UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies.
Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: \[ \text{FDV} = \text{RRF} \times \text{BDV} \]. These FDV’s are compared to the NAAQS in order to determine whether attainment is
predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.27.9. For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued
attainment is demonstrated for the Provo NAA.

<table>
<thead>
<tr>
<th>Monitor Location</th>
<th>2016-2018 BDV</th>
<th>2026 FDV</th>
<th>2035 FDV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lindon</td>
<td>31.1</td>
<td>29.3</td>
<td>29.5</td>
</tr>
<tr>
<td>Spanish Fork</td>
<td>28.4**</td>
<td>28.4</td>
<td>28.4</td>
</tr>
</tbody>
</table>

*These values include additional emissions added to the MAG MVEB from the safety margin
**This value excludes data from atypical events discussed in the BDV section

(2) Attainment Inventory

The attainment inventory is discussed in EPA guidance\(^\text{26}\) as another one of the core provisions that should
be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose
of the attainment inventory is to establish the level of emissions during the time periods associated with
monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used
in a relative sense, the modeled baseline inventory is used for comparison with every projection year
model run. For this analysis, the State compiled a baseyear inventory for the year 2017. This year falls
within the span of data representing current attainment of the PM\(_{2.5}\) NAAQS. The guidance discusses the
projection inventories as well, and notes that they should consider future growth, including population
and industry, should be consistent with the baseyear inventory, and should document data inputs and
assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

\(^{26}\) Calcagni (n 3)
Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources located within the modeling domain, encompassing all three PM$_{2.5}$ nonattainment areas, as well as a bordering region. See Figure IX.A.27.4.

Since this bordering region is so large, the State identified a “core area” within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current National Emissions Inventory (2014) from EPA for the analysis.

There are four general categories of emission sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried include: PM$_{2.5}$, SO$_2$, NO$_X$, VOC, and NH$_3$. The unit of measure for point and area sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from appropriate data sources, including information from the Governor’s Office of Management and Budget, was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning Organization and are based their travel demand modeling for 2017, 2026, and 2035. Non-road mobile source emission were calculated for each year using MOVES2014b. Growth data from appropriate data sources was used to project to 2026 and 2035. The TSD accompanying this SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035. Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier 3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NO$_X$ from 2017 to 2026 due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will continue to attain the PM$_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is also necessary to “spot check” this ten-year interval. Hence, projection inventories were prepared for 2026 and 2035. Table IX.A.27.10 summarizes these inventories. As described, it represents point, area,
on-road mobile, and non-road mobile sources in the modeling domain and include PM$_{2.5}$, as well as the
precursors SO$_2$, NO$_X$, VOC, and NH$_3$ as defined in 40 CFR Parts 50, 51, and 93.

More detail concerning any element of the inventory can be found in the appropriate section of the TSD.
More detail about the general construction of the inventory can be found in the Inventory Preparation Plan.

### Table IX.A.27. 10 Emissions Inventory in Tons Per Average Episode Day by Source Category and Year

| Emissions (tons/day) | Sector       | PM$_{2.5}$ Filterable | PM$_{2.5}$ Condensable | PM$_{2.5}$ Total | NO$_X$ | VOC | NH$_3$ | SO$_2$
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Area Sources</td>
<td>1.75</td>
<td>0.29</td>
<td>2.04</td>
<td>5.01</td>
<td>13.32</td>
<td>6.54</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Mobile Sources</td>
<td>-</td>
<td>-</td>
<td>0.83</td>
<td>15.4</td>
<td>9.07</td>
<td>0.43</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>NonRoad Sources</td>
<td>-</td>
<td>-</td>
<td>0.21</td>
<td>3.07</td>
<td>1.66</td>
<td>0</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Point Sources</td>
<td>0.18</td>
<td>0.12</td>
<td>0.3</td>
<td>1.12</td>
<td>0.18</td>
<td>0.42</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td><strong>3.38</strong></td>
<td><strong>24.6</strong></td>
<td><strong>24.23</strong></td>
<td><strong>7.39</strong></td>
<td></td>
<td></td>
<td><strong>0.22</strong></td>
</tr>
<tr>
<td>2026</td>
<td>Area Sources</td>
<td>1.89</td>
<td>0.32</td>
<td>2.21</td>
<td>3.56</td>
<td>14.2</td>
<td>6.38</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Mobile Sources</td>
<td>-</td>
<td>-</td>
<td>0.42</td>
<td>5.79</td>
<td>4.58</td>
<td>0.36</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>NonRoad Sources</td>
<td>-</td>
<td>-</td>
<td>0.14</td>
<td>2.14</td>
<td>1.65</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Point Sources</td>
<td>0.19</td>
<td>0.12</td>
<td>0.31</td>
<td>0.97</td>
<td>0.17</td>
<td>0.44</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td><strong>3.08</strong></td>
<td><strong>12.46</strong></td>
<td><strong>20.6</strong></td>
<td><strong>7.19</strong></td>
<td></td>
<td></td>
<td><strong>0.17</strong></td>
</tr>
<tr>
<td>2035</td>
<td>Area Sources</td>
<td>2.06</td>
<td>0.35</td>
<td>2.41</td>
<td>3.67</td>
<td>16.32</td>
<td>6.24</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Mobile Sources</td>
<td>-</td>
<td>-</td>
<td>1.41</td>
<td>5.74</td>
<td>6.49</td>
<td>0.44</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>NonRoad Sources</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
<td>1.84</td>
<td>1.8</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Point Sources</td>
<td>0.19</td>
<td>0.12</td>
<td>0.31</td>
<td>0.97</td>
<td>0.17</td>
<td>0.44</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td><strong>4.26</strong></td>
<td><strong>12.22</strong></td>
<td><strong>24.78</strong></td>
<td><strong>7.13</strong></td>
<td></td>
<td></td>
<td><strong>0.17</strong></td>
</tr>
</tbody>
</table>

### (3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.27.b(3) are federally enforceable and, as
demonstrated in IX.A.27.c(1) above, are sufficient to ensure continued attainment of the PM$_{2.5}$ NAAQS,
there is no need to require any additional control measures to maintain the PM$_{2.5}$ NAAQS.

### (4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Act requires regional
transportation plans and programs to show that “…emissions expected from implementation of plans and
programs are consistent with estimates of emissions from motor vehicles and necessary emissions
reductions contained in the applicable implementation plan…” EPA's transportation conformity
regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012 ) also requires that
motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be
established for any years deemed appropriate (see 40 CFR 93.118((b)(2)(i)).

For an MPO’s Regional Transportation Plan, analysis years that are after the last year of the maintenance
plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the
maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan.
(a) Mobile Source PM$_{2.5}$ Emissions Budgets

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct PM$_{2.5}$, NO$_x$, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NO$_x$, VOC, and direct PM$_{2.5}$ (primary exhaust PM$_{2.5}$ + brake and tire wear).

i. Direct PM$_{2.5}$, NO$_x$, and VOC

Direct (or “primary”) PM$_{2.5}$ refers to PM$_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct PM$_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct PM$_{2.5}$ includes road dust, brake wear, and tire wear as well as PM$_{2.5}$ from exhaust. Through atmospheric chemistry, NO$_x$ and VOC emissions can substantially contribute to secondary PM$_{2.5}$ formation. For this reason, NO$_x$ and VOC are considered PM$_{2.5}$ precursors and are the only PM$_{2.5}$ precursors emitted at a significant level by on-road mobile and therefore included in the MVEBs.

EPA’s conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the “safety margin.” As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct PM$_{2.5}$, NO$_x$, and VOC in 2035 for the Provo NAA, are listed in the first row (original MVEB) in Table IX.A.27.11. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.27.c which estimates a maximum PM$_{2.5}$ concentration of 28.5 µg/m$^3$ at the Lindon monitor in 2035 within the Provo NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the Provo NAA portion of the domain equates to 6.5 µg/m$^3$ (the 2006 24-hr PM$_{2.5}$ standard of 35.0 µg/m$^3$ minus the initial 2035 FDV of 28.5 µg/m$^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.27.11 Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the PM$_{2.5}$ standard with a maximum PM$_{2.5}$ concentration of 29.5 µg/m$^3$ at the Lindon monitor in 2035 within the Provo NAA portion of the modeling domain. The final 2035 MVEB for the Provo NAA Metropolitan Planning Organization, Mountainland Association of Governments, is listed in the last row of Table IX.A.27.11 along with the 2035 design value that includes the revised MVEB.
It is important to note that the MVEBs presented in Table IX.A.27.9 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.27.8. Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.27.8), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, PM$_{2.5}$ in the summary emissions inventory totals includes direct exhaust, tire & brake wear, and fugitive dust. For the MVEBs PM$_{2.5}$ includes direct exhaust, tire & brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states “If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan.” Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.27.9, the design values in the Provo NAA are 29.1 and 28.4 µg/m$^3$. The Lindon monitor shows the highest value at 29.1 µg/m$^3$, which is 5.9 µg/m$^3$ below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.27.12.
Although the on-road mobile NO$_X$ contribution is almost half of the total NO$_X$ in the inventory, the projected design values are so far below the standard, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

### ii. Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct PM$_{2.5}$ emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct PM$_{2.5}$ emissions may be offset with future decreases in NO$_X$ emissions from on-road mobile sources at a NO$_X$ to PM$_{2.5}$ ratio of $\frac{5.7}{5.8}$ to 1 and/or future decreases in VOC emissions from on-road mobile sources at a VOC to PM$_{2.5}$ ratio of $\frac{28.6}{27.9}$ to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO$_X$ or VOC budgets, the NO$_X$ emission reductions available to supplement the direct PM$_{2.5}$ budget shall only be those remaining after the 2035 NO$_X$ budget has been met, and the VOC emissions reductions available to supplement the direct PM$_{2.5}$ budget shall only be those remaining after the 2035 VOC budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSDs.

### (5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect. The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from both PM$_{2.5}$ SIPs.

### (6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Provo area to attainment, as required by the Act.

### (7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by monitoring the ambient air for PM$_{2.5}$; and 2) by inventoring emissions of PM$_{2.5}$ and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for PM$_{2.5}$ in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient
monitoring network for PM$_{2.5}$ each year, and any necessary modifications to the network will be implemented.

Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

(8) Contingency Plan

CAA 175A(d) - Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the Provo NAA supersedes Subsection IX.A.22.9, Contingency Measures, which is part of the moderate Provo NAA PM$_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

(a) List of Potential Contingency Measures

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the PM$_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. There were no control measures relaxed in the Provo NAA; however, below are potential contingency measure that will be evaluated. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible.

1. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents a large emissions inventory source category at 43.6% of direct PM$_{2.5}$ emissions in the 2017 county-wide inventory.

2. Measures to address fugitive dust from area sources. Fugitive dust represents 28.1% of direct PM$_{2.5}$ emissions in the 2017 county-wide inventory.

3. Additional measures to address other PM$_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, non-road vehicles and engines, and industrial sources. These source categories represent 43.2%, 8.3%, and 3.5%, respectively, of the overall 2017 baseyear emissions inventory.

In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah’s NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of PM$_{2.5}$ concentrations. Generally speaking, the
programs target Utah nonattainment areas. The programs include approximately $25.5 million from
the Volkswagen settlement and approximately $12.7 million to replace heavy-duty diesel trucks and
buses that are operating under old emissions standards. [Nonroad diesel upgrades will see
approximately $1.3 million on the Wasatch Front.] Approximately $1.3 million will go towards
upgrading non-road engines on the Wasatch Front. Another $3.8 million of the Volkswagen funding
will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using
approximately $9.6 million in federal funding to implement wood stove changeout programs
throughout the three Utah PM$_{2.5}$ NAAs.

(b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient PM$_{2.5}$ concentrations.
In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate PM$_{2.5}$
monitoring network in SLC, Provo, and Logan NAAs.

(c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean
that the area will automatically be redesignated once again to nonattainment. Instead, the State will have
an appropriate timeframe to correct the potential violation with implementation of one or more adopted
contingency measures. In the event that violations continue to occur, additional contingency measures
will be adopted until the violations are corrected.

Upon notification of a potential violation of the PM$_{2.5}$ NAAQS, the State will develop appropriate
contingency measures intended to prevent or correct a violation of the PM$_{2.5}$ standard. Information about
historical exceedances of the standard, the meteorological conditions related to the recent exceedances,
and the most recent estimates of growth and emissions will be reviewed. The possibility that an
exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the PM$_{2.5}$ NAAQS, including exceedances flagged as
exceptional events but not concurred with by EPA, the State will identify a means of corrective action
within six months after a potential violation. The maintenance plan contingency measures will be chosen
based on a consideration of cost-effectiveness, emission reduction potential, economic and social
considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is
confirmed. Any contingency measures adopted and implemented will become part of the next revised
maintenance plan submitted to the EPA for approval.
Responses to Comments Regarding R307-110-10: Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter

Utah Petroleum Association

Comment Summary A-1: The Utah Petroleum Association (UPA) recommends adding a contingency measure to the contingency plan that would control the point source chloride emissions from the US Magnesium facility, located just west of the SLC NAA. UDAQ has previously acknowledged the significant contribution of chlorides to PM$_{2.5}$ concentrations in the SLC NAA; however, determined that there needs to be additional research into the source of the chloride emissions. UDAQ has funded a study to investigate chloride sources that concludes at the end of 2019.

UDAQ previously disagreed with UPA that chloride should be added as a plan precursor. UPA contends that chloride should be a plan precursor because the preamble of the 2016 SIP Requirements Rule states that chloride exists as a precursor in some areas and substantial evidence has shown that is the case in the SLC NAA airshed. The Utah SIP in its current form does not include chloride emission controls. Therefore, UPA recommends that UDAQ add point source chloride controls for the US Magnesium facility to the contingency measures of the Maintenance Plan.

UDAQ Response to Comment A-1: Ammonium chloride can account for 15% of PM$_{2.5}$ mass during high PM episodes in the SLC NAA. The source of the chloride that takes part in ammonium chloride formation is not well understood in the airshed. The UDAQ-funded field sampling campaign conducted in 2018-2019 will help elucidate our understanding of source chloride, including the potential contribution from the US Magnesium facility. Imposing controls on US Magnesium may be premature at this point.

As UDAQ has previously stated, chloride is not considered a PM$_{2.5}$ precursor per the 2016 SIP Requirements Rule. See Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 FR 58010, 58014, Table 1 (Aug. 24, 2016) (table listing SO$_2$, NOx, VOC, and NH$_3$ as precursors to PM$_{2.5}$). As the 2016 SIP Requirements Rule describes the composition of PM$_{2.5}$ in different areas, it points out that “less common ions such as chloride are also found in PM$_{2.5}$ samples in the form of particles that include sodium chloride and ammonium chloride.” (81 FR 58015). However, it does not mean that chloride is a precursor that must be regulated and assessed. As follow up guidance to the 2016 SIP Requirements Rule, EPA also issued a memorandum addressing precursor demonstration by the states. See Fine Particulate Matter (PM2.5) Precursor Demonstration Guidance (May 30, 2019) available at https://www.epa.gov/sites/production/files/2019-05/documents/transmittal_memo_and_pm25_precursor_demo_guidance_5_30_19.pdf. This guidance does not include chloride, but only addresses NOx, SO$_2$, NH$_3$, and VOC. See id. at 23, Table 1. Until UDAQ better understands chloride sources within the airshed, we are not required to apply point source controls for chloride.

Additionally, the SLC NAA is currently attaining the standard; therefore, no additional precursors or controls are required. If the contingency plan is triggered at some date in the future, UDAQ will assess contingency measures based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate at that time. The potential contingency measures currently listed in the maintenance plans are not necessarily the only contingency measures that UDAQ would consider if the contingency plan were triggered. Contingency measures that may be implemented do not have to be listed in the maintenance plan.
Considering maintenance demonstrations project ten to twenty years into the future, it is likely that new data will be available should the contingency plan be triggered in the future.UDAQ may consider all measures, including measures addressing new precursors, and sources outside of the NAA if necessary, to demonstrate attainment. Considering this information, UDAQ will not list US Magnesium facility controls as a potential contingency measure at this time.

Comment Regarding IX.A.36

Chevron Products Company

Comment Summary A-2: Table IX.A.36.5 Point Source Emission Control Measurement Implementation Schedule and Compliance Mechanism lists “Replacement of 4 Compressor Drivers: as a BACT requirement for the Chevron Products Company. The Salt Lake Refinery believes this to be an error. The Salt Lake Refinery requests that “Replacement of 4 Compressor Drivers” be removed from the table.

UDAQ Response to Comment A-2: UDAQ will edit the table to reflect Chevron’s Approval Order.

Comment Regarding IX.A.27

McWane Ductile

Summary of Comment A-3: McWane Ductile (MDU) believes that UDAQ made a typographical error in identifying MDU’s VOC limits in the Maintenance Plan for Provo. On page 14, UDAQ identifies the RACT Equipment updates for MDU is "limiting VOC emissions" to "118.16 tons /yr.” The tpy figure, however, is incorrect. The VOC limit as 118.16 tons per year: the VOC emission limit expressed in MDU's Approval Order is 161.78 tons per year.

UDAQ Response to Comment A-3: UDAQ agrees with the commenter and will edit IX.A.27 accordingly.

Comments Regarding IX.A.28

Citizen Comments

Summary of Comment A-4: A commenter asked if there were any enforceable reductions that applied to the general public in the Logan area.

UDAQ Response to Comment A-4: The Cache County Inspection and Maintenance Program was implemented as part of the attainment strategy for the Logan area. This enforceable additional reasonable measure was approved by EPA and applies to any vehicle owner that registers a vehicle in Cache County, Utah.

Summary of Comment A-5: A commenter pointed out that there was not enough public awareness of the proposed maintenance SIP.

UDAQ Response to Comment A-5: By statute during rule proposal stage, UDAQ is required to send a copy of rule analysis to anyone who has requested it, to any person the agency is required by law to notify
(as a result of federal mandate or statute), or to any person who in the agency’s judgment is required to be notified. See Utah Code § 63G-3-301(10). The proposed rule is then published by the Office of Administrative Rules in the Utah State Bulletin, which is publicly available at https://rules.utah.gov/publications/utah-state-bull/. See id. § 63G-3-402. This is how the general public is notified of the proposed rules. UDAQ complied with these requirements.

In addition, Division of Air Quality staff sent out a notice of rulemaking actions by the Utah Air Quality Board by email on September 12th, multiple days before the 30-day public comment period began on October 1st. The email is available to those who sign up to receive it using the following google docs form: https://docs.google.com/forms/d/e/1FAIpQLSfVFDTgNkUTHRJeRgqmrM2jKk7uZ1ZhDNeJiBymv8JIUFcaqCw/viewform. The email included a link to review the documents which were presented to the Board, which can be found at the following: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. Also included was a link to the state bulletin (as noted above) and a link to the Division of Air Quality website which brings the user to a webpage for current air quality rule and plan changes open for public comment (https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment).

Furthermore, the audio recording of the meeting and the packet were both available online on the Utah Public Notice website on September 6th. The final minutes were not available until October 7th as they had to be approved by the Board before becoming finalized. The information for each Board meeting can be found by going to https://utah.gov/pmn/index.html, clicking on “state”, then “Department of Environmental Quality”, then “Air Quality Board”. After that, the user is able to choose from the listed Board meetings on the website to find the information described earlier in this paragraph.

Summary of Comment A-6: A commenter agreed that emissions testing should be discontinued for the vehicles covered by the two-speed idle program because those emissions have minimal impact.

UDAQ Response to Comment A-6: UDAQ performed a 110(l) demonstration that supports this comment.

Summary of Comment A-7: A commenter would have appreciated a better summary of the proposed rulemaking and making the summary more accessible.

UDAQ Response to Comment A-7: The process of creating a maintenance plan is iterative. Multiple rules have been adopted and amended by the Air Quality Board over the years which were referenced in the maintenance plans. Those rules, since adopted and amended during different periods of time, were not available for public comment at the same time as the maintenance plans because they were already established rules at the time. All proposed rulemaking must follow the same legal process as outlined in the first paragraph of UDAQ Response to Comment A-5. Summaries for the specific maintenance plans are available in the Board memos which are included in the packets and can be found at two different locations on the DEQ website. The first location contains the documents for the entire September meeting: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. The second link will bring up only what is currently out for public comment. This is the link for the current rules and plans out for public comment: https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment. Individuals are able to sign up to receive an email of advanced notice of rulemaking actions by the Board by going to the following form and inputting their information. https://docs.google.com/forms/d/e/1FAIpQLSfVFDTgNkUTHRJeRgqmrM2jKk7uZ1ZhDNeJiBymv8JIUFcaqCw/viewform.
Summary of Comment A-8: A commenter was concerned that the removal of the two speed idle portion of the Inspection and Maintenance Program would allow for vehicles that had been getting registered across the border in Idaho to come back across the border and register in Utah since the emission testing would no longer apply.

UDAQ Response to Comment A-8: It is possible that older vehicles will be registered now in Utah instead of Franklin. However, the airshed they operate in is the same regardless of where they are registered. It is likely that these vehicles will be driving in the same areas as when they may have been registered in Idaho.

Summary of Comment A-9: A commenter was concerned that the air quality model results supporting this SIP do not project for population grown and exclude events outside of the State’s control, such as fires, which means that air quality standards may not be met in the future.

UDAQ Response to Comment A-9: Projection inventories used for air quality modeling include appropriate population growth. Each source category inventory deals with population growth depending on the latest data and population estimates. See the technical support documentation for specific source categories and how population growth was applied. The UDAQ follows the Treatment of Data Influenced by Exceptional Events set forth in 81 FR 68216 to determine if an event was out of the State’s control.
ITEM 5
M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: November 21, 2019


On December 3, 2014, the Utah Division of Air Quality (UDAQ) submitted to the Environmental Protection Agency (EPA) the Utah State Implementation Plan (SIP) Subsection IX.A.23: Control Measures for Area and Point Sources, Fine Particulate Matter, PM$_{2.5}$ for the Logan, UT-ID Nonattainment Area (Moderate SIP). The Moderate SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the moderate area designation attainment plan.

Under the Clean Data Policy, EPA finalized a clean data determination for the Logan Nonattainment Area (Logan NAA) on October 19, 2018. The Clean Data Determination shows that the Logan NAA attained the 2006 24-hr PM$_{2.5}$ National Ambient Air Quality Standard (NAAQS) based on validated monitored data from 2015-2017.

Attainment of the standard does not mean the area is reclassified to attainment status. The EPA must act to redesignate an area from nonattainment back to attainment status. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur.

This SIP submittal addresses the five CAA requirements:
1. Attainment of the NAAQS
2. Fully Approved Attainment SIP
3. Improvement in Air Quality is due to Permanent and Enforceable Emissions Reductions
4. The State has met requirements applicable to the area under CAA Section 110 and part D
5. Fully Approved Maintenance Plan
Requirements 1-4 are addressed in the first section of this SIP submittal as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP submittal and the modeling demonstration shows that the Logan, UT-ID area continues to attain the NAAQS out to 2035, with an intermediate year check in 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

The Board proposed this SIP subsection for public comment on September 4, 2019. A 30-day public comment period was held through the month of October. Comments were received and have been summarized and responded to in Attachment B of this memorandum. Comments were minimal and did not prompt any substantive changes to the SIP subsection.

In addition to the response to comments, there were a few minor changes made to the plan as data and modeling were verified.

When sections of the State Implementation Plan (SIP) are amended by the Board, those sections must be incorporated into the Air Quality Rules. On September 4, 2019, the Board proposed the amended R307-110-10 to incorporate changes made to Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter, into the Utah Air Quality Rules.

A public comment period was held from October 1 to October 31, 2019. No comments were received and no public hearing was requested.

**Recommendation:** Staff recommends that the Board adopt IX.A.28: PM\(_{2.5}\) Maintenance Provisions for Logan, UT-ID as amended and R307-110-10 as proposed.

**Attachment A:** Amended IX.A.28: PM\(_{2.5}\) Maintenance Provisions for Logan, UT-ID.

**Attachment B:** Response to Comments Received During the SIP Subsection IX.A.28 Comment Period
PM$_{2.5}$ Maintenance Provisions for the Logan, UT-ID Nonattainment Area

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List of Acronyms and Abbreviations

BACM   Best Available Control Measure
BACT   Best Available Control Technology
CAA    Clean Air Act
CDD    Clean Data Determination
CFR    Code of Federal Regulations
CAMx   Comprehensive Air Quality Model with Extensions
DAQ    Utah Division of Air Quality (also UDAQ)
EPA    Environmental Protection Agency
FR     Federal Register
MOVES  Motor Vehicle Emission Simulator
MPO    Metropolitan Planning Organization
MVEB   Motor Vehicle Emissions Budget
μg/m³  Micrograms Per Cubic Meter
Micron One Millionth of a Meter
NAAQS  National Ambient Air Quality Standards
NH₃    Ammonia
NOₓ    Nitrogen Oxides
NNSR   Nonattainment New Source Review
PM     Particulate Matter
PM₁₀   Particulate Matter Smaller Than 10 Microns in Diameter
PM₂.₅  Particulate Matter Smaller Than 2.5 Microns in Diameter
R-307  Utah Administrative Code Air Quality Rules
RACM   Reasonably Available Control Measures
RACT   Reasonably Available Control Technology
RFP    Reasonable Further Progress
SIP    State Implementation Plan
SLC NAA Salt Lake City Nonattainment Area
SMAT   Software for Model Attainment Test
SMOKE  Sparse Matrix Operator Kernal Emissions
SO₂    Sulfur Dioxide
SOₓ    Sulfur Oxides
TPWW   Tons Per Winter Weekday
TPY    Tons Per Year
TSD    Technical Support Document
UAC    Utah Administrative Code
UT     Utah
VMT    Vehicle Miles Travelled
VOC    Volatile Organic Compounds
WRF    Weather Research and Forecasting

Section IX.A.28
PM$_{2.5}$ Maintenance Provisions for the Logan, UT-ID Nonattainment Area

IX.A.28.a Introduction

The Logan, UT-ID Nonattainment Area (Logan NAA) has attained the 2006 PM$_{2.5}$ 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the Logan NAA is eligible for redesignation to attainment status. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved attainment SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the state has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.28.b, the Logan NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA’s approval of the Logan NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.28.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the Logan NAA will continue to maintain 2006 24-hour PM$_{2.5}$ NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA’s approval of the maintenance plan, the State is requesting that the Logan NAA be redesignated to attainment for the 2006 PM$_{2.5}$ 24-hour NAAQS.¹

a) Background

In October of 2006, EPA revised the 1997 NAAQS for PM$_{2.5}$. While the annual standard remained unchanged at 15 µg /m$^3$ (until 2012), the 24-hr standard was lowered from 65 µg /m$^3$ to 35 µg /m$^3$. The Utah Division of Air Quality (“UDAQ”) has monitored PM$_{2.5}$ since 2000 and found that all areas have been in compliance with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg /m$^3$, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the Logan NAA, which includes Cache County in Utah and Franklin County in Idaho, as nonattainment for the 2006 24-hour PM$_{2.5}$ NAAQS under the Act’s general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM$_{10}$ nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to PM$_{2.5}$ nonattainment areas. These provisions require EPA to classify a PM nonattainment area as “moderate” at the time it is designated nonattainment. On June 2, 2014, the

¹ Concurrent with the State’s submittal of SIP Section IX.A.28 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the Logan NAA to attainment.
EPA classified the Logan NAA as a Moderate nonattainment area with an attainment date of December 31, 2015. Under CAA section 188(d) and 40 CFR 51.1005, the EPA may grant a state’s request to extend the attainment date for a moderate area for a 24-hr PM$_{2.5}$ standard. EPA granted two 1-year extensions to both Utah and Idaho, resulting in an attainment date of December 31, 2017 (82 FR 42447).

The Act requires areas failing to meet the federal ambient PM$_{2.5}$ standard to develop a state implementation plan (SIP) with sufficient control requirements to expeditiously attain and maintain the standard. On December 3, 2014, UDAQ submitted a moderate area SIP$^2$ for the Logan NAA that demonstrated attainment of the PM$_{2.5}$ NAAQS by December 31, 2015. EPA approval of the SIP will be discussed in Section IX.A.28.b(2).

Under the 24-hour NAAQS, compliance is determined by the average of 3 years of 98th percentile values. Since the statutory deadline for the implementation of RACM was not until December 31, 2014, it was reasonable to presume that the area might not be able to show attainment with a 3-year data set until the end of 2015 even if the control measures were having the desired effect. Presumably for this reason, Section 188(d) of the Act, (42 U.S.C. 7513(d)) allows a state to request up to two 1-year extensions of the attainment date. In doing so, the state must show that it has met all requirements of the SIP, and that the 98th percentile 24-hour concentration at each monitor in the area for the calendar year that includes the applicable attainment date is less than or equal the standard.

On September 8, 2017, EPA published notice in the Federal Register (82 FR 42447) that Utah and Idaho’s extension requests were granted. As a result, EPA must examine monitor data values from 2015-2017 to determine whether the Logan, UT-ID area attained the NAAQS by the extended attainment date.

On October 19, 2018 (83 FR 52983), the EPA published a final determination based on the validated data from 2015-2017, that the Logan, UT-ID nonattainment area attained the 2006 primary and secondary 24-hour PM$_{2.5}$ NAAQS by the December 31, 2017, attainment date. The purpose of this SIP submittal is to request redesignation of the area to attainment (IX.A.28.b) and document a ten-year maintenance plan (IX.A.28.c).

**IX.A.28.b Redesignation Requirements**

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment status. Table IX.A.28.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.28.c below.

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**Section IX.A.28**
Logan UT-ID Maintenance Plan

Table IX.A.28.1 Prerequisites to Redesignation in the Clean Air Act

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Reference</th>
<th>Addressed in Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attainment of Standard</td>
<td>Three consecutive years of PM$_{2.5}$ monitoring data must show that violations of the standard are no longer occurring</td>
<td>CAA §107(d)(3)(E)(i)</td>
<td>IX.A.28.b(1)</td>
</tr>
<tr>
<td>Approved SIP</td>
<td>The attainment SIP for the area must be fully approved</td>
<td>CAA §107(d)(3)(E)(ii)</td>
<td>IX.A.28.b(2)</td>
</tr>
<tr>
<td>Permanent and Enforceable Emissions Reductions</td>
<td>The State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable</td>
<td>CAA §107(d)(3)(E)(iii), Calcagni memo (Sect 3, para 2)</td>
<td>IX.A.28.b(3)</td>
</tr>
<tr>
<td>Section 110 and Part D requirements</td>
<td>The State must verify that the area has met all requirements applicable to the area under section 110 and Part D</td>
<td>CAA: §107(d)(3)(E)(v), §110(a)(2), Sec 171</td>
<td>IX.A.28.b(4)</td>
</tr>
<tr>
<td>Maintenance Plan</td>
<td>The Administrator has fully approved the Maintenance Plan for the area as meeting the requirements of CAA §175A</td>
<td>CAA: §107(d)(3)(E)(iv), and IX.A.28.c</td>
<td>IX.A.28.b(5)</td>
</tr>
</tbody>
</table>

1) The Area Has Attained the PM$_{2.5}$ NAAQS

CAA 107(d)(3)(E)(i) – The Administrator determines that the area has attained the national ambient air quality standard. To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA’s guidance concerning area, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling. Each component will be addressed in turn.

a) Ambient Air Quality Data (Monitoring) and Utah’s Monitoring Network

The NAAQS for PM$_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter (µg/m$^3$) for a 24-hour period and is met when the 98$^{th}$ percentile 24-hr concentration is less than or equal to 35 µg/m$^3$. Each year’s 98th percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating PM$_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr PM$_{2.5}$ standard is met when a three-year average of 98$^{th}$ percentile values is less than or equal to 35 µg/m$^3$.

PM$_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 PM$_{2.5}$ NAAQS. UDAQ’s monitors are appropriately located to assess concentration, trends, and changes in PM$_{2.5}$ concentrations. During Utah’s wintertime temperature inversions, daily sampling and real time monitoring are necessary for both public notification and to provide data for the air quality models.

The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.28.1 on the following

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page shows the location of sites along the Wasatch Front and in the Cache Valley that collect PM$_{2.5}$ data. The ambient air quality monitoring network along Utah’s Wasatch Front and in the Cache Valley is routinely audited by the EPA, and meets the agency’s requirements for air monitoring networks.
Figure IX.A.28. Utah's PM$_{2.5}$ Monitoring Network
Data may be flagged when circumstances indicate that it would represent an event in the data set and not be indicative of the entire airshed or the efforts to reasonably mitigate air pollution within. 40 CFR 50.14, Treatment of air quality monitoring data influenced by exceptional events, anticipates this, and says that a State may request EPA to exclude data showing exceedances or violations of any national ambient air quality standard that are directly due to an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, from use in determinations. The protocol for data handling dictates that flagging is initiated by the state or local agency, and then the EPA either concurs or indicates that it has not concurred.

Table IX.A.28.2 below shows the 98th percentile values in µg/m³ for 2015, 2016, and 2017 as well as the three-year average of these values. The validated data in Table IX.A.28.2 excludes several values from a wildfire exceptional event on September 6 and 7, 2017. On June 15, 2018, EPA concurred with this exceptional event and the documentation is included in the Region 8 docket for this action (EPA-R08-OAR-2018-0309). The three-year average, or design value, of 33 µg/m³ from 2015-2017 was used by EPA in their final action of determination of attainment by attainment date for the Logan NAA (83 FR 52983). The Franklin, ID monitor is within the Logan NAA on the Idaho side of the border.

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>3-year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smithfield, UT</td>
<td>28.9</td>
<td>34.4</td>
<td>36.0</td>
<td>33</td>
</tr>
<tr>
<td>Franklin, ID</td>
<td>18.8</td>
<td>33.3</td>
<td>38.3</td>
<td>30</td>
</tr>
</tbody>
</table>

Table IX.A.28.2 Monitored Ambient 24-hr PM$_{2.5}$ Data

*This value combines monitor data from the Logan, UT and Smithfield, UT monitors for 2015.

### i. Modeling Element

EPA guidance concerning redesignation requests and maintenance plans (the Calcagni memo) discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The Logan NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The Logan NAA attainment by attainment date determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the PM$_{2.5}$ NAAQS through the year 2035 (see section IX.A.28.c).

### ii. (c) EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the Logan NAA is attaining the 24-hr PM$_{2.5}$ NAAQS. On October 19, 2018, EPA published notice in the Federal Register (83 FR 52983) that pursuant to CAA section 199(b)(2), “the EPA is finalizing a determination based on the most recent three years (2015-2017) of valid data, that the Logan NAA attained the 2006 primary and secondary 24-hour
PM$_{2.5}$ NAAQS by the December 31, 2017 attainment date.” This determination was based on quality-assured, quality-controlled, and validated ambient air monitoring data for 2015-2017.

2) Fully Approved Attainment Plan for PM$_{2.5}$

CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).

On December 3, 2014, Utah submitted a SIP to EPA for the Logan NAA that demonstrated attainment of the PM$_{2.5}$ NAAQS by December 31, 2015, and subsequently, the two 1-year extensions were approved, extending the attainment date to December 31, 2017. Table IX.A.28.3 details the EPA action, date, and FR citation for SIP approval status.

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area’s approved attainment date, are eligible for reduced regulatory requirements as described in EPA’s “Clean Data Policy.”$^5$ Under the Clean Data Policy, a clean data determination was finalized on October 29, 2019 (83 FR 52983), for the Logan NAA. The approval status of the SIP is dependent on the clean data determination requirements as detailed in 81 CFR 51.1015. For a moderate PM$_{2.5}$ nonattainment area, the clean data policy suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the PM$_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the nonattainment area by a future date to be determined by the EPA. Table IX.A.28.3 details the EPA SIP approval status. EPA had approved some elements of the moderate SIP prior to the publication of the clean data determination.

Additionally, EPA guidance$^6$ states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.28.3 that show pending approval may fall into this category.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>EPA Action &amp; Date</th>
<th>FR Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Year and Projection Year Emission Inventories</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
<tr>
<td>Modeled Attainment Demonstration</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
<tr>
<td>RACT</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
<tr>
<td>On-Road Mobile RACM and Additional Reasonable Measure Demonstrations, including I/M Program</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
<tr>
<td>Direct PM$_{2.5}$, NOX and VOC MVEB</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
<tr>
<td>Non-Road Mobile RACM</td>
<td>Approved on 11/23/2018</td>
<td>82 FR 59315</td>
</tr>
</tbody>
</table>


$^6$ Calcagni (n 3)
As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control PM$_{2.5}$ and PM$_{2.5}$ precursors. On February 25, 2016 (81 FR 9343), and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and Reasonably Available Control Measure (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.28.4 for details on rules, approval dates, and implementation schedules. For the SLC NAA, the best available control measure (BACM) analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities. These rule amendments reduce emissions in the Logan NAA as well since the rules apply to all PM$_{2.5}$ NAAs. [statewide.]

<table>
<thead>
<tr>
<th>Area Source RACM</th>
<th>See Table IX.A.28.4</th>
<th>--</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonattainment New Source Review (R307-403)</td>
<td>Approved on 7/25/2019</td>
<td>84 FR 35832</td>
</tr>
<tr>
<td>Reasonable Further Progress</td>
<td>Clean Data Determination 10/29/2018</td>
<td>83 FR 52983</td>
</tr>
<tr>
<td>Quantitative Milestones</td>
<td>Clean Data Determination 10/29/2018</td>
<td>83 FR 52983</td>
</tr>
<tr>
<td>Contingency Measures</td>
<td>Clean Data determination 10/29/2018</td>
<td>83 FR 52983</td>
</tr>
</tbody>
</table>

**Table IX.A.28. 3 Logan, UT-ID SIP Approval Status**

<table>
<thead>
<tr>
<th>Control Measures for UT Moderate PM$_{2.5}$ SIPs</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>R307-302 Solid Fuel Burning Devices $^1$</td>
<td>February 1, 2017</td>
</tr>
<tr>
<td>EPA conditionally approved* October 19, 2016 (81 FR 71988).</td>
<td></td>
</tr>
<tr>
<td>R307-303 Commercial Cooking $^1$</td>
<td>December 15, 2015</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343).</td>
<td></td>
</tr>
<tr>
<td>R307-304 Solvent Cleaning $^1$</td>
<td>December 6, 2017</td>
</tr>
<tr>
<td>R307-307 Road Salting and Sanding</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343).</td>
<td></td>
</tr>
<tr>
<td>R307-309 Nonattainment and Maintenance Areas for PM$<em>{10}$ and PM$</em>{2.5}$: Fugitive Emissions and Fugitive Dust $^1$</td>
<td>Salt Lake County, Utah County, and the City of Ogden – January 1, 2013.</td>
</tr>
<tr>
<td>EPA proposed for approval September 14, 2017 (82 FR 43205).</td>
<td>Remaining NAAs – April 1, 2013.</td>
</tr>
<tr>
<td>R307-312 Aggregate Processing Operations for PM$_{2.5}$ Nonattainment Areas.</td>
<td>Amended August 4, 2017</td>
</tr>
<tr>
<td>EPA approved October 19, 2016 (81 FR 71988).</td>
<td>February 4, 2016</td>
</tr>
<tr>
<td>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs</td>
<td>Implementation Schedule</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343).</td>
<td></td>
</tr>
<tr>
<td><strong>R307-342 Adhesives &amp; Sealants</strong></td>
<td>December 1, 2014</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343).</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td><strong>R307-346 Metal Furniture Surface Coatings</strong></td>
<td>Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td><strong>R307-347 Large Appliance Surface Coatings</strong></td>
<td>Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
</tbody>
</table>

Section IX.A.28
<table>
<thead>
<tr>
<th>EPA-Approved/Conditionally Approved Control Measures for UT Moderate PM$_{2.5}$ SIPs</th>
<th>Implementation Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-352 Metal Containers, Closure, and Coil Coatings</td>
<td>January 1, 2014 Amended December 6, 2017</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-353 Plastic Parts Coatings</td>
<td>January 1, 2014 Amended December 6, 2017</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-354 Automotive Refinishing Coatings</td>
<td>January 1, 2014 Amended December 6, 2017</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities</td>
<td>January 1, 2014 Amended March 8, 2018</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
<tr>
<td>R307-356 Appliance Pilot Light</td>
<td>January 1, 2013</td>
</tr>
<tr>
<td>EPA approved February 25, 2016 (81 FR 9343)</td>
<td></td>
</tr>
</tbody>
</table>
Table IX.A.28. 4 Area Source Rules Implementation Xchedule and EPA Approval Status

<table>
<thead>
<tr>
<th>Control Measure Implementation Schedule and review if any new sources located in the NAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>*UDAQ submitted the committed revisions on February 1, 2017, within the one-year conditional approval window</td>
</tr>
</tbody>
</table>

Part of Franklin County, ID is included in the Logan, UT-ID NAA. As a result, Idaho DEQ submitted a moderate SIP to Region 10 in 2014. Table IX.A.28.5 outlines control measures developed by Idaho DEQ.

On January 4, 2017 (82 FR 729), the EPA approved the residential woodstove curtailment program and change-out program. On March 25, 2014 (79 FR 16203), the EPA approved the road sanding agreements as a voluntary measure.

Table IX.A.28. 5 Idaho Control Measures and Implementation Schedule

<table>
<thead>
<tr>
<th>EPA-Approved Control Measures for the Idaho Portion of the Logan NAA</th>
<th>Implementation Schedule</th>
<th>Estimated Reductions (uncontrolled-to-controlled emissions) in tons-per-day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Woodstove Curtailment Program</td>
<td>Fully implemented summer and fall 2012</td>
<td>0.06 tpd direct PM$_{2.5}$, 0.009 tpd NO$_X$, and 0.078 tpd volatile organic compounds (VOC)</td>
</tr>
<tr>
<td>Residential Woodstove Change-Out Program</td>
<td>2006–2007, 2011–2012, and 2013–2014</td>
<td>0.05 tpd direct PM$_{2.5}$, 0.003 tpd NO$_X$, 0.13 tpd VOC</td>
</tr>
<tr>
<td>Road Sanding Agreements</td>
<td>July 16, 2012 and October 25, 2012</td>
<td>0.10 tpd direct PM$_{2.5}$</td>
</tr>
</tbody>
</table>

Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the Logan NAA.

3) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions

CAA 107(d)(3)(E)(iii) - The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and
enforceable reductions. Speaking further on the issue, EPA guidance\textsuperscript{7} reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

\textbf{a) Improvement in Air Quality}

The improvement in air quality with respect to PM$_{2.5}$ can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the Logan NAA, these control strategies were implemented as the result of the SIP submitted to EPA in December 2014 with a statutory control deadline of December 31, 2014. With this deadline in mind, the emission reduction results of the controls would not be reflected in the ambient data until 2015.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored PM$_{2.5}$ (see Figures IX.A.28.2 and IX.A.28.3). The Logan NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98\textsuperscript{th} percentile average of 24-hr data as well as the annual arithmetic mean to understand trends (see Figure IX.A.28.2). Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary PM$_{2.5}$. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the PM$_{2.5}$ concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct PM$_{2.5}$ and PM$_{2.5}$ precursors. This variability is apparent in Figure IX.A.28.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of a little under one µg/m$^3$ per year.

This episodic variability is reduced by looking at annual mean values of PM$_{2.5}$ concentrations shown in Figure IX.A.28.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98\textsuperscript{th} percentiles, as well as the values ranked even higher. Still the trend is downward. Fitting a line through the data collected at the Logan site reveals a trend that noticeably decreases, and indicates an improvement of approximately four µg/m$^3$ over the 18-year span.

Table IX.A.28.3 shows the annual 98\textsuperscript{th} percentile values at the Logan or Smithfield monitor including the years used for nonattainment designation (2006-2008) to 2017. The statutory deadline for controls to be in place was December 31, 2014. Thus, 2015 marked the first year in which these control measures would be reflected in the data.

\textsuperscript{7} Ibid
Figure IX.A.28. 2 Logan NAA PM$_{2.5}$ Annual Mean Concentration

b) Reduction in Emissions

As stated above, EPA guidance\textsuperscript{8} says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State should estimate the percent reduction (from the year that was used to determine the design value)

\textsuperscript{8} Ibid
achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.28.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the Logan NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the Logan NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date. As defined in CAA Section 171(1), the term reasonable further progress means “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.” Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

The nonattainment SIP for the Logan NAA included a new vehicle inspection I/M program for on-road vehicles as well as a suite of area source rules targeting emissions of PM$_{2.5}$, NO$_X$, and VOC. This is discussed in SIP Subsection IX.A.23(6), and is reflected in the attainment demonstration presented in Subsection IX.A.23(4). The RACM prescribed by the nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the NAA to the EPA in 2017, which is included in the TSD. There are no stationary point sources in the Logan NAA with the potential to emit 100 tons per year of PM$_{2.5}$ or any PM$_{2.5}$ plan precursor.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce PM$_{2.5}$. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales). For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies gasoline to the Wasatch Front market, are considered small refineries by EPA’s rule. As such, these refineries have a tier 3 delayed implementation date of January 1, 2020, to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

UDAQ submitted quantitative milestone reports to EPA on March 23, 2018, within the 90-day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating “The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the...."
enclosures. This determination is based on the EPA’s review of information contained in the moderate area plans and additional information provided in the 2017 Quantitative Milestone Reports.” This approval letter is included in the TSD.

Furthermore, since these control measures are incorporated into the Utah SIP, the emission reductions that resulted are consistent with the notion of permanent and enforceable improvements in air quality. Taken together, the trends in ambient air quality illustrated previously, along with the continued implementation of the nonattainment SIP for the Logan NAA, provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.

4) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to PM$_{2.5}$.

a) Section 110

The State has met all requirements applicable to the Logan NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 PM$_{2.5}$ NAAQS. EPA approved the State’s Infrastructure SIP on November 25, 2013 (78 FR 63883), for all Section 110 requirements that are applicable to redesignation.

b) Part D Subpart 1 and 4

Part D of the Act addresses “Plan Requirements for Nonattainment Areas.” Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA’s issuance of a final clean data determination demonstrating that the Logan NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review (“NNSR”) program and emissions inventory submission. The State has satisfied these remaining requirements. Utah’s NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The emissions inventory as included in the moderate SIP for the Logan NAA and was approved by the EPA on November 23, 2018 (82 FR 39315). Therefore, Utah has complied with all applicable Part D requirements.
5) Maintenance Plan for PM_{2.5} Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.

IX.A.28.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance\(^9\) has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Reference</th>
<th>Addressed in Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance demonstration</td>
<td>Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.</td>
<td>CAA: 175A(a)</td>
<td>IX.A.28.c (1)</td>
</tr>
<tr>
<td>Revise in 8 Years</td>
<td>The State must submit an additional revision to the plan, 8 years after redesignation, showing an additional 10 years of maintenance.</td>
<td>CAA: 175A(b)</td>
<td>IX.A.28.c (6)</td>
</tr>
<tr>
<td>Continued Implementation of Nonattainment Area Control Strategy</td>
<td>The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.</td>
<td>CAA: 175A(c), 110(l), Calcagni memo</td>
<td>IX.A.28.c (5)</td>
</tr>
<tr>
<td>Contingency Measures</td>
<td>Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.</td>
<td>CAA: Sec 175A(d)</td>
<td>IX.A.28.c (8)</td>
</tr>
<tr>
<td>Verification of Continued Maintenance</td>
<td>The maintenance plan must indicate how the State will track the progress of the maintenance plan.</td>
<td>Calcagni memo</td>
<td>IX.A.28.c (7)</td>
</tr>
</tbody>
</table>

Table IX.A.28. 6 CAA Maintenance Plan Requirements

\(^9\) Ibid
1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance\(^\text{10}\) as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah’s NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient PM\(_{2.5}\) during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

c) Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5\(^\text{11}\). SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly, and hourly values.

\(^{10}\) Ibid

\(^{11}\) https://www.cmascenter.org/smoke/
- **Spatial:** Convert emissions from a county-wide average to gridded emissions.
- **Speciation:** Decompose PM$_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct PM$_{2.5}$ and PM$_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA’s 2011v6\(^{12}\) modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse for Inventories and Emissions Factors (CHIEF\(^{13}\)) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

### 1. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.28.4). This configuration allows one to efficiently integrate regional effects with local impacts within the Logan NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.

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13 https://www.epa.gov/chief
The UDAQ 4 km coarse domain covers the entire state of Utah, a significant portion of Eastern Nevada (including Las Vegas), as well as smaller portions of Idaho, Wyoming, Colorado, and Arizona. The fine 1.33 km domain covers all of Utah’s three PM2.5 nonattainment areas, including the Logan NAA. Throughout this document, we will refer to the fine 1.33 km domain as the “modeling domain” when the coarse domain is not specified.

**ii. Meteorological Data**

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ. Meteorological inputs were derived using the Weather Research and Forecasting\(^\text{14}\) (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

\(^{14}\) [https://www.mmm.ucar.edu/weather-research-and-forecasting-model](https://www.mmm.ucar.edu/weather-research-and-forecasting-model)
Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSD.

### iii. Episode Selection

Part of the modeling exercise involves a test to see whether the model can successfully replicate the PM$_{2.5}$ mass and composition that was observed during prior episode(s) of elevated PM$_{2.5}$ concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance$^{15}$ identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated PM$_{2.5}$.
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah’s SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour PM$_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

Previous work conducted by the University and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model$^{16}$. A

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$^{15}$ Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM$_{2.5}$, and Regional Haze.

$^{16}$ https://www.mmm.ucar.edu/weather-research-and-forecasting-model
comprehensive discussion of the meteorological model performance for all three episodes may be found in the Technical Support Document for the meteorological modeling\textsuperscript{17}.

\textbf{a) Model Adjustments and Settings}

In order to better simulate Utah’s winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (Kvpatch)
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high PM\textsubscript{2.5} days (burn ban)
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry)
4. Ammonia injection to account for missing ammonia sources in UDAQ’s inventory. This is defined as artificially adding non-inventoried ammonia emissions to the inventoried emissions that are input into CAMx.
5. Reduced the dry deposition rate of ammonia by setting ammonia Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
6. Applied a 93\% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

Kvpatch improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The burn ban adjustments reflect the compliance rate with the state’s two-stage policy ban on wood-burning.

A 93\% reduction in paved road dust emissions was only applied to the January 2011 emissions. This adjustment helped improve the model performance for crustal material.

\textbf{b) Episodic Model Performance}

Shown below for each of three episodes are the CAMx performance results for total 24-hour PM\textsubscript{2.5} mass and PM\textsubscript{2.5} chemical species, including nitrate (NO\textsubscript{3}), sulfate (SO\textsubscript{4}), ammonium (NH\textsubscript{4}), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass).

\emph{January 1-10, 2011}

\begin{itemize}
\item \textsuperscript{17}https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf
A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011, at the Logan monitoring station in the Logan NAA showed that the model overall captures the temporal variation in PM$_{2.5}$ well (Figure IX.A.28.5). The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. However, despite the overall good representation of the temporal variation of PM$_{2.5}$, concentrations are generally biased low in the model, particularly on January 4-9, 2011, which can be related to the meteorological model performance on these days. Temperature was overestimated by 5-15 °C in the meteorological model during this period and thick low-level clouds were simulated on January 5 while clouds were not observed on this day.$^{18}$

![Logan UT-ID Maintenance Plan](image)

**Figure IX.A.28.5 Measured and Modeled 24-hr PM$_{2.5}$ Concentrations During January 1-10, 2011 at Logan Monitoring Station in the Logan NAA**

The model performance for PM$_{2.5}$ species was overall good. Figure IX.A.28.6 shows a comparison of modeled and measured PM$_{2.5}$ chemical species on January 7, which corresponds to a PM$_{2.5}$ exceedance day. The model performance for SO$_4$ was reasonably good, with measured and modeled SO$_4$ accounting for 3 and 5% of PM$_{2.5}$ mass, respectively. The model also underestimated NO$_3$ and NH$_4$, which is partly related to the meteorological model performance where temperature was overestimated by 5-15 °C in WRF during January 4-10, 2011, as aforementioned. The underestimation in modeled NO$_3$ and NH$_4$ can also be related to an underestimation in modeled hydrochloric acid (HCl) and oxidants sources (more details are provided in the TSD). The model, on the other hand, overall overestimated elemental carbon (EC) and organic carbon (OC). The overprediction in these species on days when the simulated atmospheric mixing was particularly strong suggests that this overestimation is potentially related to an...

overestimation in their source emissions. It is, however, noteworthy that despite these biases in modeled PM$_{2.5}$ species, modeled NO$_3$ and NH$_4$ account for most of the PM$_{2.5}$ mass, in agreement with measurements.

![Figure IX.A.28.6 a) Measured and b) Modeled Chemical Composition of 24-hour PM$_{2.5}$ (in µg/m$^3$ and %) of PM$_{2.5}$ at Logan monitoring station on January 7, 2011](image)

Overall, the model simulated well the timing of the capping inversion during this January episode. PM$_{2.5}$ chemical species are also reasonably well simulated in the model, suggesting that this episode is suitable for modeling.

**December 7-19, 2013**

A comparison of modeled and measured 24-hr PM$_{2.5}$ at Logan during the December 7-19, 2013, episode showed that the model did not represent well the temporal variation in PM$_{2.5}$ and the capping inversion (Figure IX.A.28.7). While observations show a peak in PM$_{2.5}$ concentrations on December 14, CAMx is simulating a drop in PM$_{2.5}$ levels. This can be attributed to the meteorological model performance, where the model did not properly capture the cold overnight low temperatures that were observed on this day$^{19}$.

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The model performance for PM$_{2.5}$ chemical species was overall poor for this episode as indicated by a comparison of measured and modeled PM$_{2.5}$ chemical composition at Logan monitoring station on a PM$_{2.5}$ exceedance day (Figure IX.A.28.8). Given that measurements of PM$_{2.5}$ chemical species were not available for a PM$_{2.5}$ exceedance day during the December 7-19 modeling episode, this analysis is based on a comparison of the fraction of individual PM$_{2.5}$ chemical species in total PM$_{2.5}$ mass between 2013 model outputs and measurements from 2011. Measurements correspond to filter speciation data collected at Logan during a typical winter-time inversion event in 2011. As can be seen, NO$_3$ and NH$_4$ are both significantly underpredicted in the model, which can be related to the meteorological model performance, where WRF overpredicted surface temperatures, leading to increased mixing. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied in the December 2013 simulations. OC was also overestimated in the model while the performance for SO$_4$ and EC was reasonably good.

Given that PM$_{2.5}$ species were poorly represented in this episode and that the strength of the capping inversion and timing of the PM$_{2.5}$ peaks were not well simulated, the December 2013 episode for the maintenance demonstration modeling is not desirable.
Figure IX.A.28. 8 a) Measured and b) Modeled Species Contribution (in µg/m³ and %) to PM₂.₅ at Logan Monitoring Station in the Logan NAA on a Typical 24-hr PM₂.₅ Exceedance Day

February 1-16, 2016

A comparison of modeled and measured 24-hr PM₂.₅ at Smithfield monitoring station in the Logan NAA shows that PM₂.₅ concentrations are biased low in the model (Figure IX.A.28.9). The timing of the PM₂.₅ peaks is also poorly simulated. This can be mainly related to the meteorological model performance. A warm modeled temperature bias in the Cache Valley due to early snow melt-out and premature dissipation of simulated clouds in the model likely contributed to increased mixing and dispersion of PM₂.₅ in the photochemical model²⁰.

The model performance for PM$_{2.5}$ chemical species was overall weak for this episode as indicated by a comparison of measured and modeled PM$_{2.5}$ chemical composition at Logan monitoring station on a PM$_{2.5}$ exceedance day (Figure IX.A.28.10). Given that measurements of PM$_{2.5}$ chemical species were not available for a PM$_{2.5}$ exceedance day during the February 1-16 modeling episode, this analysis is based on a comparison of the fraction of individual PM$_{2.5}$ chemical species in total PM$_{2.5}$ mass between 2016 model outputs and measurements from 2011. Measurements correspond to filter speciation data collected at Logan during a typical winter-time inversion event in 2011. As can be seen, NO$_3$ and NH$_4$ are both underpredicted in the model, which can be partly related to the meteorological model performance, where WRF overpredicted surface temperatures. Moreover, similarly to the model performance for the January 2011 episode, EC and crustal material are overpredicted in the model. An adjustment to paved road dust emissions was not applied in the February 2016 simulations.
Figure IX.A.28. 10 a) Measured and b) Modeled Species Contribution (in %) to PM$_{2.5}$ at Logan Monitoring Station in the Logan NAA on a Typical 24-hr PM$_{2.5}$ Exceedance Day

Given that PM$_{2.5}$ species and total mass are not well simulated and that the timing of the PM$_{2.5}$ peaks is poorly represented in the model, this episode is not suitable for maintenance demonstration modeling.

Conclusion

Examining the PM$_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with the Persistent Cold Air Pool Study (PCAPS$^{21}$), an exhaustive field campaign. This was further confirmed by a linear regression analysis that showed that modeled and measured PM$_{2.5}$ at Logan monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.72$) compared to the other two episodes ($R^2 = 0.18$ and 0.39) (Figure IX.A.28.11).

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$^{21}$ http://www.pcaps.utah.edu/
Figure IX.A.28. 11 Modeled vs. Measured 24-hr PM$_{2.5}$ for Each of the Three Modeling Episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode.

The January 2011 WRF data produced superior performance for all important metrics when compared with the other two episodes. Therefore, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the Technical Support Document.
(c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support for the model modifications and settings that were applied (ammonia injection, increase of surface resistance to ammonia, zeroing-out of ozone deposition velocity, snow albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more accurately reproduce winter-time inversion episodes.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data included 24-hr total PM$_{2.5}$ and 24-hr chemically-speciated PM$_{2.5}$ measurements collected at Logan monitoring station in the Logan NAA. Ammonia measurements collected during special field studies were also used for this performance evaluation. The evaluation was based on the January 1-10, 2011, episode and the 2011 emissions inventory were used as input data for the model simulations. The evaluation focused on days with PM$_{2.5}$ concentration exceeding the 24-hr national ambient air quality standard (> 35 µg/m$^3$).

A more detailed model performance evaluation that examines the model performance for gaseous species is provided in the TSD. More details on the model performance at various sites within the Logan NAA are also included in the TSD.

Daily PM$_{2.5}$ Concentrations

A comparison of 24-hr modeled and observed PM$_{2.5}$ during January 1-10, 2011, at the Logan monitoring station in the Logan NAA showed that the model overall captures the temporal variation in PM$_{2.5}$ well (Figure IX.A.28.12). The gradual increase in PM$_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. However, despite the overall good representation of the temporal behavior of PM$_{2.5}$, concentrations are overall biased low in the model, particularly on January 4-9, 2011, which can be partly related to the meteorological model performance on these days, as aforementioned. Temperature was overestimated by 5-15 °C during this period and thick low-level clouds were simulated on January 5 while clouds were not observed on this day$^{22}$. This resulted in an increasingly deep sub-cloud mixing layer in the model compared to reality, which led to an underprediction in modeled PM$_{2.5}$ concentrations.

Figure IX.A.28. 12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hour Average \( PM_{2.5} \) Concentrations during January 1 – 10, 2011 at Logan Monitoring Station in the Logan NAA. Dashed red line shows 24-hr \( PM_{2.5} \) NAAQS.

PM\(_{2.5}\) Chemical Speciation

To further investigate the model performance, measured and modeled \( PM_{2.5} \) chemical species were compared at the Logan monitoring site. Figure IX.A.28.13 shows a comparison of the bulk chemical composition of measured and modeled \( PM_{2.5} \) at Logan on January 7, 2011, which corresponds to the only \( PM_{2.5} \) exceedance day when measurement data are available. Chemical species, including nitrate (NO\(_3\)), sulfate (SO\(_4\)), ammonium (NH\(_4\)), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM), and other species (other mass), were considered in this analysis. The model performance evaluation for non-\( PM_{2.5} \) exceedance days is provided in the TSD.

The model performance for SO\(_4\) was reasonably good, with measured and modeled SO\(_4\) accounting for 3% and 5% of \( PM_{2.5} \), respectively. The model also underestimated NO\(_3\) and NH\(_4\), which can be related to the meteorological model performance, where the model simulated a weaker temperature inversion compared to reality\(^2\). The underestimation in modeled NO\(_3\) and NH\(_4\) can also be related to an underestimation in modeled HCl and CI\(_2\)O\(_2\) (more details are provided in the TSD). The model also overall overestimated primary \( PM_{2.5} \) species, including crustal material and EC. OC was also overpredicted. The overprediction in these species on days when the simulated atmospheric mixing was particularly strong suggests that this overestimation is potentially related to an overestimation in their source emissions.

The model performance was also evaluated for NH$_3$, which is an important precursor to the formation of ammonium nitrate, ammonium sulfate, and ammonium chloride, all of which are important PM$_{2.5}$ species accounting for over 50% of the PM$_{2.5}$ mass during winter-time inversion events.

Hourly modeled NH$_3$ (Figure IX.A.28.14) was compared to hourly NH$_3$ measurements (Figure IX.A.28.15) conducted at the Logan air monitoring station during a special field study in winter 2017. Measurements from 2017 were considered since measurements of NH$_3$ were not available during 2011. However, while these 2017 field study measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are qualitatively useful to assess if the model predicts similar levels of NH$_3$ during strong inversion conditions.

A comparison of measured and modeled NH$_3$ shows that modeled NH$_3$ at the Logan site is well within the range observed in 2017.
Figure IX.A.28. 14 Hourly Time Series of Modeled NH$_3$ (ppb) at Logan Monitoring Station During January 1-10, 2011

Figure IX.A.28. 15 Measured NH$_3$, Ammonium and PM$_{2.5}$ at Logan Monitoring Site During the 2017 Utah Winter Fine Particulate Study (UWFPS). Figure Retrieved from the UWFPS Final Report\textsuperscript{24}

Summary of Model Performance

The model performance replicating the buildup and clear out of PM$_{2.5}$ is good overall. The model captures the temporal variation in PM$_{2.5}$ well. Moreover, total modeled PM$_{2.5}$ mass is dominated by NO$_3$, in agreement with measurements, and simulated concentrations of NH$_3$ are within the range of those observed. However, while PM$_{2.5}$ mass is dominated by NO$_3$, the model tends to underestimate ammonium nitrate, which is potentially due to an underestimation in free radical sources. Future research is needed to

\textsuperscript{24} 2017 Utah Winter Fine Particulate Study
https://www.esrl.noaa.gov/csd/groups/csd7/measurements/2017uwfps/finalreport.pdf
evaluate how accurately the model simulates free radical sources, which would help further improve the
model performance.

Several observations should be noted on the implications of these model performance findings on the
attainment modeling presented in the following section. First, it has been demonstrated that model
performance overall is good and, thus, the model can be used for air quality planning purposes. Second,
consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA
suggests that this approach “should reduce some of the uncertainty attendant with using absolute model
predictions alone.”

d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For
any given (future) year, an attainment projection is made by calculating a concentration termed the Future
Design Value (FDV). This value is calculated for each monitor included in the analysis, and then
compared to the NAAQS (35 µg/m³). If the FDV at every monitor located within a NAA is less than the
NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This
span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan
development. To be conservative, attainment projections were made for 2035. An assessment was also
made for 2026 as a “spot-check” against emission trends within the ten-year span.

PM₂.₅ Baseline Design Values

For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be
quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the
24-hour PM₂.₅ NAAQS, which is the 98th percentile value averaged over a three-year period.
Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute
answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the
predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan
is 2017. This comparison results in a relative response factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01
utility from EPA\(^{25}\) to perform the modeled attainment test for daily PM₂.₅. SMAT is designed to
interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to
the FRM monitors. It also calculates the RRF for grid cells near each monitor and uses these to calculate

\(^{25}\) https://www.epa.gov/scram/photochemical-modeling-tools
a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was used as the boundary for RRF calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful, and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of three days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA. UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies. Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: \( \text{FDV} = \text{RRF} \times \text{BDV} \). These FDV’s are compared to the NAAQS in order to determine whether attainment is predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.28.7.

For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued attainment is demonstrated for the Logan NAA.

<table>
<thead>
<tr>
<th>Monitor Location</th>
<th>2016-2018 BDV</th>
<th>2026 FDV</th>
<th>2035 FDV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smithfield</td>
<td>32.6</td>
<td>28.0</td>
<td>28.2</td>
</tr>
</tbody>
</table>

Table IX.A.28.7 Baseline and Future Design Values (µg/m³) at the Monitor in Logan NAA

*This value includes additional emissions added to the CMPO MVEB from the safety margin

2) Attainment Inventory

The attainment inventory is discussed in EPA guidance\(^{26}\) as another one of the core provisions that should be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose of the attainment inventory is to establish the level of emissions during the time periods associated with monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used in a relative sense, the modeled baseline inventory is used for comparison with every projection year model run. For this analysis, the state compiled a baseyear inventory for the year 2017. This year falls within the span of data representing current attainment of the PM\(_{2.5}\) NAAQS. The guidance discusses the projection inventories as well, and notes that they should consider future growth, including population and industry, should be consistent with the baseyear inventory, and should document data inputs and assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

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\(^{26}\) Calcagni (n 3)
Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources located the modeling domain, encompassing all three PM$_{2.5}$ nonattainment areas, as well as a bordering region. See Figure IX.A.28.4.

Since this bordering region is so large, the State identified a “core area” within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current (2014) National Emissions Inventory from EPA for the analysis.

There are four general categories of emission sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried included: PM$_{2.5}$, SO$_2$, NO$_x$, VOC, and NH$_3$. The unit of measure for point and area sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from appropriate data sources, including information from the Governor’s Office of Management and Budget, was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning Organization and are based on their travel demand modeling for 2017, 2026, and 2035. Non-road mobile source emissions were calculated for each year using MOVES2014b. Growth data from appropriate data sources was used to project to 2026 and 2035. The TSD accompanying this SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035. Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier 3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NO$_x$ from 2017 to 2026 due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will continue to attain the PM$_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is also necessary to “spot check” this ten-year interval. Hence, projection inventories were prepared for 2026 and 2035. Table IX.A.28.8 summarizes these inventories. As described, it represents point, area,
on-road mobile, and non-road mobile sources in the modeling domain and include PM\textsubscript{2.5}, as well as the
precursors SO\textsubscript{2}, NO\textsubscript{X}, VOC, and NH\textsubscript{3} as defined in 40 CFR Parts 50, 51, and 93. More detail concerning
any element of the inventory can be found in the appropriate section of the TSD. More detail about the
general construction of the inventory can be found in the Inventory Preparation Plan.

<table>
<thead>
<tr>
<th>Emissions (tons/day)</th>
<th>Sector</th>
<th>PM\textsubscript{2.5} Filterable</th>
<th>PM\textsubscript{2.5} Condensable</th>
<th>PM\textsubscript{2.5} Total</th>
<th>NO\textsubscript{x}</th>
<th>VOC</th>
<th>NH\textsubscript{3}</th>
<th>SO\textsubscript{2}</th>
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<tbody>
<tr>
<td></td>
<td>Area Sources</td>
<td>0.56</td>
<td>0.04</td>
<td>0.6</td>
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<td>3.8</td>
<td>13.48</td>
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<tr>
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<td>Mobile Sources</td>
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<td>–</td>
<td>0.23</td>
<td>3.76</td>
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<td>0.1</td>
<td>0.02</td>
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<td></td>
<td>NonRoad Sources</td>
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<td>–</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Point Sources</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>Total</td>
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<td>8.45</td>
<td>13.58</td>
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<td>Area Sources</td>
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<td>Mobile Sources</td>
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<td>1.39</td>
<td>0.09</td>
<td>0.01</td>
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<td></td>
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<td>0.06</td>
<td>0.59</td>
<td>1.27</td>
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<td></td>
<td>Point Sources</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.83</td>
<td>2.81</td>
<td>6.54</td>
<td>13.36</td>
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<td></td>
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<tr>
<td></td>
<td>Mobile Sources</td>
<td>–</td>
<td>–</td>
<td>0.19</td>
<td>1.76</td>
<td>1.91</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>NonRoad Sources</td>
<td>–</td>
<td>–</td>
<td>0.05</td>
<td>0.57</td>
<td>1.04</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>Point Sources</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.91</td>
<td>3.04</td>
<td>7.24</td>
<td>13.21</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table IX.A.28. 8 Emissions Inventories in Tons per Average Episode Day by Year and Source Category

3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.28.b(3) are federally enforceable and, as
demonstrated in IX.A.28.c(1) above, are sufficient to ensure continued attainment of the PM\textsubscript{2.5} NAAQS,
there is no need to require any additional control measures to maintain the PM\textsubscript{2.5} NAAQS.

4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Clean Air Act (CAA) requires
regional transportation plans and programs to show that “…emissions expected from implementation of
plans and programs are consistent with estimates of emissions from motor vehicles and necessary
emissions reductions contained in the applicable implementation plan…” EPA's transportation conformity
regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012 ) also requires that
motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be
established for any years deemed appropriate (see 40 CFR 93.118((b)(2)(i)).

Section IX.A.28
For an MPO’s Regional Transportation Plan, analysis years that are after the last year of the maintenance plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the maintenance plan’s motor vehicle emissions budget(s) for the last year of the implementation plan.

**a) Mobile Source PM$_{2.5}$ Emissions Budgets**

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct PM$_{2.5}$, NO$_X$, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NO$_x$, VOC, and direct PM$_{2.5}$ (primary exhaust PM$_{2.5}$ + brake and tire wear).

**(i) Direct PM$_{2.5}$, NO$_X$, and VOC**

Direct (or “primary”) PM$_{2.5}$ refers to PM$_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct PM$_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct PM$_{2.5}$ includes road dust, brake wear, and tire wear as well as PM$_{2.5}$ from exhaust. Through atmospheric chemistry, NO$_X$ and VOC emissions can substantially contribute to secondary PM$_{2.5}$ formation. For this reason, NO$_X$ and VOC are considered PM$_{2.5}$ precursors and are the only PM$_{2.5}$ precursors emitted at a significant level by on-road mobile, and therefore included in the MVEBs.

EPA’s conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the “safety margin.” As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct PM$_{2.5}$, NO$_x$, and VOC in 2035 for the Logan NAA, are listed in the first row (original MVEB) in Table IX.A.28.9. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.28.c.(1) which estimates a maximum PM$_{2.5}$ concentration of 25.9 µg/m$^3$ in 2035 within the Logan NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the Logan NAA portion of the domain equates to 9.1 µg/m$^3$ (the 2006 24-hr PM$_{2.5}$ standard of 35.0 µg/m$^3$ minus the initial 2035 FDV of 25.9 µg/m$^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.28.9 Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the PM$_{2.5}$ standard with a maximum PM$_{2.5}$ concentration of 28.2 µg/m$^3$ at the Smithfield monitor in 2035 within the Logan NAA portion of the modeling domain. The final 2035 MVEB for WFRC is listed in the last row of Table IX.A.28.9 along with the 2035 design value that includes the revised MVEB.
Logan UT-ID Maintenance Plan

Section IX.A.28

<table>
<thead>
<tr>
<th></th>
<th>Direct PM$_{2.5}$</th>
<th>NO$_X$</th>
<th>VOC</th>
<th>Design Value @ controlling monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original MVEB</td>
<td>0.1</td>
<td>1.02</td>
<td>1.18</td>
<td>25.9 µg/m$^3$</td>
</tr>
<tr>
<td>Additional Tons Per Day from Safety Margin</td>
<td>0.1</td>
<td>1.0</td>
<td>1.0</td>
<td>--</td>
</tr>
<tr>
<td>Final 2035 MVEB</td>
<td>0.2</td>
<td>2.02</td>
<td>2.18</td>
<td>28.2 µg/m$^3$</td>
</tr>
</tbody>
</table>

Table IX.A.28. 9 2035 Cache Metropolitan Planning Organization Motor Vehicle Emission Budget in Tons per Winter Weekday

It is important to note that the MVEBs presented in Table IX.A.28.9 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.28.8.

Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.28.8), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, PM$_{2.5}$ in the summary emissions inventory totals includes direct exhaust, tire and brake wear, and fugitive dust. For the MVEBs PM$_{2.5}$ includes direct exhaust, tire and brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states "If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan."

Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.28.7., the design value at Smithfield in the Logan NAA is 28.0 µg/m$^3$. This value is 7.0 µg/m$^3$ below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.28.10

<table>
<thead>
<tr>
<th>Emissions tons/day</th>
<th>PM$_{2.5}$</th>
<th>NO$_X$</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2026 emission inventory total</td>
<td>.83</td>
<td>2.81</td>
<td>6.55</td>
</tr>
<tr>
<td>2026 on-road mobile inventory</td>
<td>.13</td>
<td>1.52</td>
<td>1.39</td>
</tr>
<tr>
<td>On-road mobile % of total inventory</td>
<td>15.66%</td>
<td>54.09%</td>
<td>21.22%</td>
</tr>
</tbody>
</table>

Table IX.A.28. 10 2026 On-Road Mobile Inventory Compared to Total 2026 Emissions Inventory

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38
Although the on-road mobile NOX contribution is over half of the total NOX in the inventory, the projected design value is far enough below the standard, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

(ii) Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct PM\(_{2.5}\) emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct PM\(_{2.5}\) emissions may be offset with future decreases in NO\(_X\) emissions from on-road mobile sources at a NO\(_X\) to PM\(_{2.5}\) ratio of 3.4 to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO\(_X\) or VOC budgets, the NO\(_X\) emission reductions available to supplement the direct PM\(_{2.5}\) budget shall only be those remaining after the 2035 NO\(_X\) budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSD.

5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect. The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from the PM\(_{2.5}\) SIP.

6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Cache/Franklin County area to attainment, as required by the Act.

7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by monitoring the ambient air for PM\(_{2.5}\); and 2) by inventorying emissions of PM\(_{2.5}\) and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for PM\(_{2.5}\) in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient monitoring network for PM\(_{2.5}\) each year, and any necessary modifications to the network will be implemented.
Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

8) Contingency Plan

CAA 175A(d) - Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the Logan NAA supersedes Subsection IX.A.23.9, Contingency Measures, which is part of the moderate Logan NAA PM$_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

(a) List of Potential Contingency Measures

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the PM$_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. For the Logan NAA, this includes number one in the list below, followed by other potential contingency measures. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible.

1. Reinstate two speed idle (TSI) portion of the Cache County inspection and maintenance program (see section IX.A.28.c.(9) for explanation of 110(l) demonstration.
2. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents a large emissions inventory source category at 52.9% of direct PM$_{2.5}$ emissions in 2017.
3. Measures to address fugitive dust from area sources. Fugitive dust represents a large emissions inventory source category at 21.1% of direct PM$_{2.5}$ emissions in 2017.
4. Additional measures to address other PM$_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, and non-road vehicles and engines. These source categories represent 23.1%, 10.8%, respectively, of the overall 2017 baseyear emissions inventory.

In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah’s NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of PM$_{2.5}$ concentrations. Generally speaking, the
programs target Utah nonattainment areas. The programs include approximately $25.5 million from the Volkswagen settlement and approximately $12.7 million to replace heavy-duty diesel trucks and buses that are operating under old emissions standards. [Nonroad diesel upgrades will see approximately $1.3 million on the Wasatch Front. ] Another $3.8 million of the Volkswagen funding will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using approximately $9.6 million in federal funding to implement wood stove changeout programs throughout the three Utah PM$_{2.5}$ NAAs.

(b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient PM$_{2.5}$ concentrations. In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate PM$_{2.5}$ monitoring network in SLC, Provo, and Logan NAAs.

(c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean that the area will automatically be redesignated once again to nonattainment. Instead, the State will have an appropriate timeframe to correct the potential violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected.

Upon notification of a potential violation of the PM$_{2.5}$ NAAQS, the State will develop appropriate contingency measures intended to prevent or correct a violation of the PM$_{2.5}$ standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedances, and the most recent estimates of growth and emissions will be reviewed. The possibility that an exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the PM$_{2.5}$ NAAQS, including exceedances flagged as exceptional events but not concurred with by EPA, the State will identify a means of corrective action within six months after a potential violation. The maintenance plan contingency measures will be chosen based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is confirmed. Any contingency measures adopted and implemented will become part of the next revised maintenance plan submitted to the EPA for approval.

9) CAA Section 110(l) Analysis

CAA Section 110(l) allows for revisions to a SIP as long as it does not interfere with any applicable requirement concerning attainment and reasonable further progress. This maintenance plan includes a 110(l) demonstration that addresses the removal of the Inspection and Maintenance (I/M) Program Two Speed Idle (TSI) biennial testing procedure for Cache County, UT. Only the TSI portion will be removed in 2021 and the demonstration shows that there will be minimal impact on the overall on-road mobile source inventory within the Logan NAA. The 110(l) demonstration also shows non-interference for other
NAAQS being monitored in Cache County, Utah. See the full 110(l) demonstration in Appendix A for a more comprehensive discussion on other NAAQS.

Cache County officials and the Bear River Health Department successfully approved and implemented an I/M program on January 1, 2014. The I/M program is comprised of a decentralized test and repair network and requires a biennial test for all light duty gasoline vehicles 1969 and newer. Vehicles that are [older than] Model Year 1995 and older [1996 - ] undergo TSI testing procedures while vehicles [newer than] Model Year 1996 and newer are required to undergo On Board Diagnostic (OBD) testing procedures. The details of the program can be found in Section X, Part F, of the Utah SIP. The EPA approved the Cache County I/M program as an additional reasonable control measure for the moderate SIP.

In 2019, the Cache County Council adopted a county ordinance that discontinues only the TSI portion of the I/M program with an effective date of January 1, 2021. The TSI-tested vehicles comprise approximately 5% of the vehicles tested through the I/M program, and that percentage decreases each year as older vehicles requiring TSI are no longer operational. The estimated disbenefit of removing the TSI portion of the I/M program is detailed in Table IX.A.28.11 with numbers calculated use the EPA MOVES model.

<table>
<thead>
<tr>
<th>On-Road Mobile</th>
<th>Vehicles tested</th>
<th>NOX TPD</th>
<th>VOC TPD</th>
<th>NOX+VOC TPD</th>
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</thead>
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<tr>
<td>2021 OBD+TSI</td>
<td>30,224</td>
<td>2.51</td>
<td>1.85</td>
<td>4.36</td>
</tr>
<tr>
<td>2021 TSI</td>
<td>1,899</td>
<td>-.025</td>
<td>-.029</td>
<td>-.05</td>
</tr>
<tr>
<td>% change</td>
<td>6.2%</td>
<td>.98%</td>
<td>1.55%</td>
<td>2.53%</td>
</tr>
</tbody>
</table>

| 2025 OBD+TSI   | 32,298          | 1.78    | 1.53    | 3.31        |
| 2025 TSI       | 1,341           | -.013   | -.023   | -.036       |
| % change       | 4.1%            | .74%    | 1.53%   | 2.27%       |

Table IX.A.28. 11 TSI Removal Disbenefit of On-Road Emissions

<table>
<thead>
<tr>
<th>NOX</th>
<th>VOC</th>
<th>NOX+VOC TPD</th>
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</thead>
<tbody>
<tr>
<td>2026 Total Inventory Emissions (tpd)</td>
<td>2.81</td>
<td>6.55</td>
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<td>2025 TSI Emission Reduction (tpd)</td>
<td>0.013</td>
<td>0.023</td>
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<td>2026 TSI % of Total Emissions</td>
<td>0.46%</td>
<td>0.35%</td>
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Table IX.A.28. 12 TSI Removal Disbenefit of Total Emissions Inventory

The MOVES model only accepts vehicle inputs for 30 model years. Therefore, by 2026, the TSI program emissions reduction can no longer be quantified because TSI is performed on vehicles 1995[6] and older. Since MOVES modelling cannot determine the TSI disbenefit in 2026, Table IX.A.28.12 compares the 2025 TSI removal emission additions to the 2026 total inventory emission numbers. When compared to the overall inventory, the emissions addition resulting from TSI removal are minimal at less than half a
percent and will not interfere with attainment of any NAAQS or other applicable requirements under the CAA. For the full 110(l) demonstration, see Appendix A.
Appendix A

TECHNICAL SUPPORT DOCUMENT
FOR A CAA 110(l) DEMONSTRATION
FOR THE LOGAN, UT-ID PM$_{2.5}$ NONATTAINMENT AREA

Utah Division of Air Quality
Planning Branch/Mobile Sources
Abstract

This report discusses the CAA section 110(l) demonstration regarding the emissions impact of removing the Inspection and Maintenance Program Two Speed Idle (TSI) testing procedure for Cache County in 2021. This report includes the on-road mobile inventory impacts for the Logan, UT-ID PM$_{2.5}$ nonattainment area. This assessment will cover the service life of the TSI program from 2021-2026.

On-road inventories were calculated using the EPA MOVES2014b (Motor Vehicle Emission Simulator) and were developed by the following agencies:

Cache Metropolitan Planning Organization (CMPO): Cache County
Utah Division of Air Quality (UDAQ)

Summary on-road emissions table inventories for a representative winter weekday are located at the end of the TSD for the following years: 2021-2026.
ii. Overview

The State of Utah submitted a State Implementation Plan (SIP) for the EPA designated 24-hour PM$_{2.5}$ Logan, Utah UT-ID nonattainment area in December of 2014. EPA approved the Cache County Inspection and Maintenance program (implemented by the Bear River Health Department) on September 9, 2015 (80 FR 54237), and it was included as an additional reasonable control measure in the SIP on November 23, 2018 (83 FR 59315). Pursuant to Utah Code Annotated 41-6a-1642(1), Cache County officials successfully implemented an I/M program on January 1, 2014. Cache County’s I/M program is comprised of a decentralized test and repair network and requires a biennial test for all light duty gasoline vehicles 1969 and newer. Vehicles that are older than Model Year 1995 undergo Two Speed Idle (TSI) testing procedures while vehicles newer than Model Year 1996 are required to undergo On Board Diagnostic (OBD) testing procedures. The program exempts vehicles less than six years old from an emission inspection. The details of the program can be found in Section X, Part F, of the Utah SIP.

In December 2018 the Bear River Health Department proposed amending the Vehicle Emissions and Maintenance program. The proposal made to the Cache County Council was to discontinue the TSI program due to a diminishing fleet of older light duty gasoline vehicles participating within the program combined with increasing cost of maintaining TSI testing equipment. The Cache County Council passed the proposal to discontinue the TSI program with an effective date of January 1, 2021. The Utah Division of Air Quality, EPA Region 8, and the Bear River Health Department have been coordinating to ensure that the proposed I/M program changes do not interfere with State and Federal air quality regulations.

Section 110(l) of the Clean Air Act (CAA) allows for revisions to a SIP so long as it does not interfere with any applicable requirement concerning attainment and reasonable further progress or any other applicable requirement of this chapter of the CAA. This 110(l) demonstration addresses the removal of the I/M Program TSI biennial testing procedure for Cache County in 2021 and shows that there will be minimal impact on the overall on-road mobile source inventory within the Logan, UT-ID PM$_{2.5}$ nonattainment area (NAA) from 2021-2026 and demonstrates non-interference for other National Ambient Air Quality Standards (NAAQS) being monitored in Cache County, Utah.

The removal of the TSI program will not interfere with the ability of the Logan, UT-ID NAA to continue to attain the EPA 24 hour PM$_{2.5}$ national ambient air quality standard despite a very small increase in emissions. This document explains the emissions modeling assumptions used to develop the on-road mobile emissions estimates for the 110(l) demonstration. The modeling portion of the demonstration will cover the EPA MOVES model service life emissions credit for the TSI program for the years 2021-2026. The TSI testing program covers light duty gasoline
vehicles that are older than Model Year 1995 and was established as a control strategy in the Logan, UT-ID PM$_{2.5}$ Nonattainment SIP (December 3, 2014).

The analysis simply looks at the emissions credit assigned to the overall I/M program, including OBD and TSI within Cache County within the 2021-2026 period and compares it to the emissions credit without the TSI program (OBD only). Emission estimates are based on meteorological conditions that occurred during three PM$_{2.5}$ episodes: 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17. Inventory estimations were created at the county level representing an average January weekday.

Emission estimates are confined to the EPA approved MOVES2014b (May 2017) emissions model. This model produces emissions estimates for on-road vehicles by providing emissions profiles for exhaust, evaporative, and wear conditions. Inputs include speeds, vehicle fuel profiles and specifications, vehicle miles traveled (VMT), I/M program profiles, VMT mix, vehicle age distributions, and meteorological conditions. Specific MOVES input parameters and outputs can be found in the Cache IM Program 110(l).xlsx workbook and specific MOVES modeling inputs can be furnished upon request.

Additional analysis was also performed comparing the PM$_{2.5}$ SIP I/M 2015 program credit that the EPA approved for Cache County to the new proposed I/M program for 2021. Ambient air quality monitoring data from the Smithfield, Cache County site also demonstrates non-interference with the NAAQS when looking at the small increase in emissions due to the removal of the TSI program. Cache County, Utah is currently attaining the six NAAQS.

**iii. MOVES Modeling Procedure**

The discussion below identifies the procedures followed to model the episodic inventories. The following agencies developed on-road mobile source emissions inventories:

CMPO: Cache Metropolitan Planning Organization
Utah Division of Air Quality

1. **MOVES Default Database Enhancement for Local Roads**

The local road enhancement allows the EPA MOVES2014b model to produce emissions results according to the Highway Performance Monitoring System (HPMS) utilized by the Federal Highway Administration, Utah Department of Transportation, Cache Metropolitan Planning Organization (CMPO), and the Utah Division of Air Quality (UDAQ). Arterial and local roads have very different travel characteristics. This simplified approach allows each road type to have specific VMT, speed and vehicle distribution by road type (vehicle mix) inputs. Modeling specific road types creates an
inventory approach that matches the HPMS road types that are reported within local transportation plans.

Modifications to Local Road Tables

<table>
<thead>
<tr>
<th>Table Names</th>
<th>Data Columns</th>
<th>Description of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>avgspeeddistribution</td>
<td>roadTypeID</td>
<td>Road types rural local(32) and</td>
</tr>
<tr>
<td>drivescheduleassoc</td>
<td>avgSpeedBinID</td>
<td>urban local(52) added.</td>
</tr>
<tr>
<td>hourvmtfraction</td>
<td>driveScheduleID</td>
<td></td>
</tr>
<tr>
<td>roadtype</td>
<td>hourVMTFraction</td>
<td></td>
</tr>
<tr>
<td>roadtypedist</td>
<td>roadDesc</td>
<td></td>
</tr>
<tr>
<td>zoneroadtype</td>
<td>roadTypeVMTFraction</td>
<td></td>
</tr>
</tbody>
</table>

2. MOVES2014 Daily Pollutants

Pollutants selected for analysis:
- Ammonia (NH3)
- Oxides of Nitrogen (NOx)
- PM$_{2.5}$ & PM$_{10}$ (Primary Exhaust, Brake, & Tire)
- Sulfur Dioxide (SO2)
- Volatile Organic Compounds (VOC)

3. MOVES2014b Local Model Inputs

County Data Manager Development

MOVES organizes data inputs into databases called County Data Manager (CDM) tables. CDMs were developed for all of the Logan, UT-ID PM$_{2.5}$ NAA for: 2021-2026, for an average weekday in January.

(1) Average Speed Distribution and VMT

Cache MPO obtained average speed distributions from its 2019 Travel Demand Model. The TDM analyzes thousands of separate traffic segments called "links" that together comprise the network of roads in Cache County. Each link is assigned, for each of the four major time periods during the day (AM peak, midday, PM peak and nighttime), an average speed, an increment of VMT and an increment of VHT (vehicle hours traveled). A specific number of links are assigned to each of the UDOT HPMS functional classes (road types, e.g., rural local, urban local, rural minor arterial, urban minor arterial, and so on). In effect, average speeds, VMT and VHT for each of the functional classes are combined to obtain average speed, VMT and VHT for rural arterials, urban arterials, rural local roads and urban local roads. (There are no interstates in Cache County).
(2) AVFT (Diesel, Gasoline, Electric Fractions)

MOVES AVFT (alternative vehicle and fuel technology) was updated with 2017 State DMV registration data on fuel type for registered light duty vehicles (passenger cars and light duty trucks). The fuel type data provided covers gasoline, diesel, flex, and electric light duty vehicles. The DMV fractions were specifically applied to all model years for passenger car and light duty trucks. (MOVES source types 21,31,32) MOVES2014a default AVFT values were used for all remaining source type vehicles (MOVES sourcetypes 40-60).

(3) Fuel & HourVMTFraction

MOVES 2014a default fuel and hour VMT fraction parameters were used.

(4) HPMSvTypeYear (VMT)

Cache MPO VMT was constructed from its 2019 Travel Demand Model. UDOT Division of Systems Planning and Programming provided 2017 VMT travel fractions for FHWA vehicle classes grouped by Gross Vehicle Weight Rating (GVWR) ranges. The travel fractions were obtained by county from automated pneumatic counters that detect axle spacing and "weigh-in motion" (WIM) counters placed on arterial, interstate, and local roads. UDOT also provided average VMT daily adjustment factors (2016) to provide winter month and daily activity detail. The VMT daily adjustment factors allow for the modeling of an average weekday, Saturday, and Sunday in January.

(5) I/M Coverage

UDAQ constructed I/M Program coverages in consultation with the Bear River Health Department in Cache County. The Cache County I/M program exempts the first six model years and performs a biennial test on light duty gasoline vehicles beginning in the seventh model year. Vehicles older than 1995 undergo a TSI test and vehicles newer than 1996 undergo OBD. The EPA MOVES model service life emissions credit for the TSI program is essentially removed in 2026. The compliance rate was calculated utilizing EPA I/M reports and incorporated the waiver rate, total OBD and TSI failures, and regulatory class coverage. This work is shown in the Cache IM Program 110(l).xlsx workbook.

(6) Road Type Distribution
UDOT Division of Systems Planning and Programming provided 2017 VMT travel fractions for FHWA vehicle classes grouped by GVWR ranges. The travel fractions were obtained by county from automated pneumatic counters that detect axle spacing and WIM counters placed on arterial, interstate, and local roads. CMPO TDM 2019 VMT and Vehicle Mix data were used to construct road type distribution and VMT by sourcetype.

(7) **Source Type Age Distribution**

Utah Department of Motor Vehicle (DMV) provided a single age distribution for passenger cars (21) and light trucks (31,32) for 2017. The age distribution was held constant for all years modeled. MOVES2014b default age distribution values were used for all remaining source type vehicles.

(8) **Source Type Year (Vehicle Population)**

CMPO utilized Utah DMV 2017 registration data for Model Years 2017-1969 for motor cycles, passenger cars, and light duty trucks up to 10,000 GVWR. The MOVES default vehicle fraction for these vehicles was used to determine the difference between cars and trucks since the DMV data could not discern between a passenger car and light duty truck. MOVES 2014a default vehicle populations were used for heavy duty vehicles. The VMT growth rate from the CMPO travel demand model was used to estimate future population growth.

(10) **ZoneMonthHour (Meteorological Data)**

The UDAQ Technical Analysis Section provided metrological conditions from Meso West University of Utah from three PM$_{2.5}$ episodes: 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17. The UDAQ modeling section provided hourly temperature and relative humidity profiles from representative weather stations in Cache County. The meteorology data represents the hour by hour average for all of the days in the 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17 PM$_{2.5}$ episodes. The average of all the hourly temperatures and relative humidity readings over the three episodes for each representative weather station was used to reflect the atmospheric conditions that represent the PM$_{2.5}$ season.

**iv. Emissions Trend Estimates**
The Logan, UT-ID PM$_{2.5}$ Nonattainment SIP (December 3, 2014) established the TSI testing biennial emissions control strategy that covers light duty gasoline vehicles that are older than Model Year 1995. The purpose of this 110(l) demonstration is to show the amount of emissions credit being lost by the removal of the TSI testing program in the Logan, UT-ID NAA in 2021. Specifically, the demonstration shows the small amount of emissions credit being lost will not interfere with the ability of the NAA to continue to attain the EPA 24 hour PM$_{2.5}$ standard from 2021-2026.

The MOVES model service life credit for the TSI program will essentially phased out completely by the year 2026. The MOVES model only accepts vehicle inputs covering 30 model years. In 2026 the model year coverage is 2026-1996. This modeling concept does not allow for the input of vehicles that are model year 1995 and older to be modeled in the year 2026. The emissions trends in Table 1 on page 12 shows the fading impact of the TSI program in terms of reduced vehicles being tested and the result of diminishing emissions credit through the 2021-2025 testing period.

MOVES 2014b vehicle input estimates regarding the removal of the TSI emissions program for the years 2021-2026 for the Logan, UT-ID PM$_{2.5}$ NAA shows that the number of pre-1996 biennial TSI vehicles being tested over time is declining. Meanwhile, the number of vehicles undergoing biennial OBD testing program is growing (1996 and newer). In the year 2021, it is estimated that the amount of pre-1996 TSI vehicles are estimated to be 1,899 vehicles. In 2025, the number of pre-1996 TSI vehicles is trending downward toward 1,341 vehicles. This is a result of the pre-1996 TSI vehicles getting older and leaving the fleet. Meanwhile in the same period the number of vehicles that are 1996 and newer undergoing OBD is increasing. In the year 2021 it is estimated that the number of 1996 and newer vehicles will be 28,325. In 2025, that number is trending upward 30,958 vehicles being tested. The vehicle population of pre-1996 TSI vehicles is declining as older vehicles are being scrapped, while the 1996 OBD vehicle population is growing as brand new vehicles are being purchased.

The MOVES 2014b emissions estimates for the TSI program shows that the emissions credit from pre-1996 vehicles TSI is declining over a period of time as the overall vehicle population of pre-1996 TSI vehicles declines. In 2021, the removal of the TSI program is projected to increase emissions by an estimated .053 tons per day of NOx and VOC emissions combined, an increase of 2.53%. This is equivalent to increasing emissions by 107 pounds per day. In 2025 the removal of the TSI program is projected to increase emissions by an estimated .036 tons per day of NOx and VOC combined, an increase of 2.27%. This is equivalent to increasing emissions by 73 pounds per day. In 2026 the TSI emissions credit is essentially phased out of the EPA MOVES emission model. (Please note that MOVES emissions model only provides TSI emissions credits for Oxides of Nitrogen (NOx) and Volatile Organic Compounds (VOC).

Additional analysis was performed comparing the original 2015 SIP I/M program credit to the new proposed I/M program for 2021. The original SIP I/M program (OBD+TSI) was estimated
to reduce emissions by .426 tons per day of NOx and VOC combined in 2015. In 2021, the removal of the TSI program is projected to increase emission by an estimated .053 tons per day of NOx and VOC emissions combined. This is equivalent to increasing emissions by 107 pounds per day. Using the emissions increase from the removal of the TSI program the original 2015 I/M program would have seen an estimated increase in NOx emissions by 11% and VOC by 13%, or a combined 12% increase. This analytical approach is conservative and does not take into account the shrinking vehicle population and emissions of pre 1996 vehicles, increase vehicle population and emissions of 2017 newer model year vehicles that meet Federal Tier 3 emissions standards, and VMT growth. The conservative analysis does indicate that the previous MOVES modeling demonstration showing a 2.53% increase in emissions in 2021 is within a reasonable range.

### Cache Attainment

<table>
<thead>
<tr>
<th>SIP I/M Emissions Credit for 2015 OBD + TSI</th>
<th>TSI I/M Credit to be removed for 2021</th>
<th>Cache Attainment SIP I/M Emissions Credit for 2015 OBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx</td>
<td>VOC</td>
<td>NOx +VOC</td>
</tr>
<tr>
<td>Tons Per Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.214</td>
<td>0.2</td>
<td>0.426</td>
</tr>
<tr>
<td>LBS Per Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>424</td>
<td>852</td>
</tr>
</tbody>
</table>

Lost TSI Credit % for 2015

<table>
<thead>
<tr>
<th>NOx</th>
<th>VOC</th>
<th>NOx +VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>-11.45%</td>
<td>-13.44%</td>
<td>-12.44%</td>
</tr>
</tbody>
</table>

The design values at the monitor in Smithfield, Cache County are in compliance with the following NAAQS and indicate that a 2.5% increase in NOx and VOC emissions combined will not interfere with Cache County, Utah being able to attain the NAAQS.

### Smithfield NAAQS Design Value

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Design Value (3 yr. Average)</th>
<th>Standard</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>0.062</td>
<td>0.063</td>
<td>0.069</td>
<td>0.064</td>
<td>0.07</td>
<td>ppm</td>
</tr>
<tr>
<td>PM 2.5 98 %tile</td>
<td>34</td>
<td>36</td>
<td>27.9</td>
<td>33</td>
<td>35</td>
<td>μg/m3</td>
</tr>
<tr>
<td>PM 2.5 Annual Mean</td>
<td>7.6</td>
<td>7.9</td>
<td>7.3</td>
<td>7.6</td>
<td>12</td>
<td>μg/m3</td>
</tr>
<tr>
<td>PM 10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Est. Exceedances</td>
</tr>
<tr>
<td>NO2</td>
<td>37</td>
<td>37</td>
<td>30</td>
<td>35</td>
<td>100</td>
<td>ppb</td>
</tr>
</tbody>
</table>
The table below shows the most current air quality standards for the six criteria air pollutants and Cache County’s designation status with respect to each standard.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Primary/ Secondary NAAQS</th>
<th>Averaging Time</th>
<th>Level</th>
<th>Designation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>Primary</td>
<td>8-hour</td>
<td>9 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-hour</td>
<td>35 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td>Lead</td>
<td>Primary and Secondary</td>
<td>Rolling 3 month average</td>
<td>0.15 µg/m³</td>
<td>Attainment</td>
</tr>
<tr>
<td>NO₂</td>
<td>Primary</td>
<td>1-hour</td>
<td>100 ppb</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>Primary and Secondary</td>
<td>Annual</td>
<td>53 ppb</td>
<td>Attainment</td>
</tr>
<tr>
<td>Ozone</td>
<td>Primary and Secondary</td>
<td>8-hour</td>
<td>0.070 ppm</td>
<td>Attainment</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>Primary</td>
<td>Annual</td>
<td>12 µg/m³</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td></td>
<td>15 µg/m³</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>Primary and Secondary</td>
<td>24-hour</td>
<td>35 µg/m³</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>Primary and Secondary</td>
<td>24-hour</td>
<td>150 µg/m³</td>
<td>Attainment</td>
</tr>
<tr>
<td>SO₂</td>
<td>Primary</td>
<td>1-hour</td>
<td>75 ppb</td>
<td>Attainment</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>3-hour</td>
<td>0.5 ppm</td>
<td>Attainment</td>
</tr>
</tbody>
</table>

Although Logan, UT-ID is currently designated as a nonattainment area for the 24-hr PM₂.₅ NAAQS, on October 19, 2018 (83 FR 52983), the EPA published a final determination that based on the validated data from 2015-2017, the Logan, UT-ID nonattainment area attained the 2006 primary and secondary 24-hr PM₂.₅ NAAQS by the December 31, 2017 attainment date. Utah will submit a redesignation request to EPA in 2019.

The CAA 110(l) demonstration regarding the removal of the I/M TSI for Cache County, Utah in 2021 finds that there will be minimal impact on the overall on-road mobile source inventory within the Logan, UT-ID PM₂.₅ NAA from 2021-2026. The TSI test program covers light duty gasoline vehicles that are older than Model Year 1995. The MOVES 2014b vehicle population and emissions estimates clearly indicate a shrinking vehicle population and emissions from pre-
1996 TSI light duty gasoline vehicles. The increase in emissions from the MOVES analysis indicated a 2.5% increase of NOx and VOC combined.
Table 1. Cache County On-Road Mobile Source Emissions for Average Winter Weekday (Tons Per Day)

<table>
<thead>
<tr>
<th>Year</th>
<th>I/M Test Type</th>
<th>NH3</th>
<th>NOx TPD</th>
<th>PM10</th>
<th>PM25</th>
<th>NOx TPD</th>
<th>VOC TPD</th>
<th>VOC_Refuel</th>
<th>VMT</th>
<th>Vehicles Tested</th>
<th>NOx TPD</th>
<th>NOx TPD</th>
<th>VOC TPD</th>
<th>VOC TPD</th>
<th>NOx + VOC TPD (Total)</th>
<th>NOx + VOC LBS (Total)</th>
<th>NOx + VOC TPD % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>OBD + TSI</td>
<td>0.10</td>
<td>2.51</td>
<td>0.43</td>
<td>0.17</td>
<td>0.17</td>
<td>2.51</td>
<td>0.08</td>
<td>3,312,467</td>
<td>30,224</td>
<td>0.08</td>
<td>2.51</td>
<td>0.08</td>
<td>2.51</td>
<td>0.08</td>
<td>-0.02</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>OBD</td>
<td>0.10</td>
<td>2.54</td>
<td>0.43</td>
<td>0.17</td>
<td>0.17</td>
<td>2.54</td>
<td>0.08</td>
<td>3,312,467</td>
<td>28,325</td>
<td>0.08</td>
<td>2.54</td>
<td>0.08</td>
<td>2.54</td>
<td>0.08</td>
<td>-0.02</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>(-)TSI</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.00</td>
<td>1,899</td>
<td>-0.025</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.549</td>
<td>-0.021</td>
</tr>
<tr>
<td>2022</td>
<td>OBD + TSI</td>
<td>0.10</td>
<td>2.29</td>
<td>0.42</td>
<td>0.16</td>
<td>0.16</td>
<td>2.29</td>
<td>0.08</td>
<td>3,373,213</td>
<td>30,730</td>
<td>0.08</td>
<td>2.29</td>
<td>0.08</td>
<td>2.29</td>
<td>0.08</td>
<td>-0.02</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>OBD</td>
<td>0.10</td>
<td>2.31</td>
<td>0.42</td>
<td>0.16</td>
<td>0.16</td>
<td>2.31</td>
<td>0.08</td>
<td>3,373,213</td>
<td>29,181</td>
<td>0.08</td>
<td>2.31</td>
<td>0.08</td>
<td>2.31</td>
<td>0.08</td>
<td>-0.02</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(-)TSI</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>1,549</td>
<td>-0.021</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.573</td>
<td>-0.018</td>
</tr>
<tr>
<td>2023</td>
<td>OBD + TSI</td>
<td>0.10</td>
<td>2.09</td>
<td>0.42</td>
<td>0.15</td>
<td>0.15</td>
<td>2.09</td>
<td>0.07</td>
<td>3,433,958</td>
<td>31,244</td>
<td>0.07</td>
<td>2.09</td>
<td>0.07</td>
<td>2.09</td>
<td>0.07</td>
<td>-0.018</td>
<td>-0.87%</td>
</tr>
<tr>
<td></td>
<td>OBD</td>
<td>0.10</td>
<td>2.11</td>
<td>0.42</td>
<td>0.15</td>
<td>0.15</td>
<td>2.11</td>
<td>0.07</td>
<td>3,433,958</td>
<td>29,671</td>
<td>0.07</td>
<td>2.11</td>
<td>0.07</td>
<td>2.11</td>
<td>0.07</td>
<td>-0.018</td>
<td>-0.87%</td>
</tr>
<tr>
<td></td>
<td>(-)TSI</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>1,573</td>
<td>-0.018</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.320</td>
<td>-0.015</td>
</tr>
<tr>
<td>2024</td>
<td>OBD + TSI</td>
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</tbody>
</table>
v. Appendix: Inventories For 110(l) Demonstration

Input files will be furnished upon request:

vi. References

The following documents were used as references in creating the 110(l) demonstration:


4. I/M Programs Bear River Health Department, 655 East 1300 North. Logan, UT 84341, 801-792-6500

5. MESOWEST UTAH, (met data archive), University of Utah, Department of Atmospheric Sciences, http://mesowest.utah.edu/

6. US EPA Design Value Report May 6, 2019
Responses to Comments Regarding R307-110-10: Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter

Utah Petroleum Association

Comment Summary A-1: The Utah Petroleum Association (UPA) recommends adding a contingency measure to the contingency plan that would control the point source chloride emissions from the US Magnesium facility, located just west of the SLC NAA. UDAQ has previously acknowledged the significant contribution of chlorides to PM$_{2.5}$ concentrations in the SLC NAA; however, determined that there needs to be additional research into the source of the chloride emissions. UDAQ has funded a study to investigate chloride sources that concludes at the end of 2019.

UDAQ previously disagreed with UPA that chloride should be added as a plan precursor. UPA contends that chloride should be a plan precursor because the preamble of the 2016 SIP Requirements Rule states that chloride exists as a precursor in some areas and substantial evidence has shown that is the case in the SLC NAA airshed. The Utah SIP in its current form does not include chloride emission controls. Therefore, UPA recommends that UDAQ add point source chloride controls for the US Magnesium facility to the contingency measures of the Maintenance Plan.

UDAQ Response to Comment A-1: Ammonium chloride can account for 15% of PM$_{2.5}$ mass during high PM episodes in the SLC NAA. The source of the chloride that takes part in ammonium chloride formation is not well understood in the airshed. The UDAQ-funded field sampling campaign conducted in 2018-2019 will help elucidate our understanding of source chloride, including the potential contribution from the US Magnesium facility. Imposing controls on US Magnesium may be premature at this point.

As UDAQ has previously stated, chloride is not considered a PM$_{2.5}$ precursor per the 2016 SIP Requirements Rule. See Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 FR 58010, 58014, Table 1 (Aug. 24, 2016) (table listing SO$_2$, NOx, VOC, and NH$_3$ as precursors to PM$_{2.5}$). As the 2016 SIP Requirements Rule describes the composition of PM$_{2.5}$ in different areas, it points out that “less common ions such as chloride are also found in PM$_{2.5}$ samples in the form of particles that include sodium chloride and ammonium chloride.” (81 FR 58015). However, it does not mean that chloride is a precursor that must be regulated and assessed. As follow up guidance to the 2016 SIP Requirements Rule, EPA also issued a memorandum addressing precursor demonstration by the states. See Fine Particulate Matter (PM2.5) Precursor Demonstration Guidance (May 30, 2019) available at https://www.epa.gov/sites/production/files/2019-05/documents/transmittal_memo_and_pm25_precursor_demo_guidance_5_30_19.pdf. This guidance does not include chloride, but only addresses NOx, SO$_2$, NH$_3$, and VOC. See id. at 23, Table 1. Until UDAQ better understands chloride sources within the airshed, we are not required to apply point source controls for chloride.

Additionally, the SLC NAA is currently attaining the standard; therefore, no additional precursors or controls are required. If the contingency plan is triggered at some date in the future, UDAQ will assess contingency measures based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate at that time. The potential contingency measures currently listed in the maintenance plans are not necessarily the only contingency measures that UDAQ would consider if the contingency plan were triggered. Contingency measures that may be implemented do not have to be listed in the maintenance plan.
Considering maintenance demonstrations project ten to twenty years into the future, it is likely that new data will be available should the contingency plan be triggered in the future. UDAQ may consider all measures, including measures addressing new precursors, and sources outside of the NAA if necessary, to demonstrate attainment. Considering this information, UDAQ will not list US Magnesium facility controls as a potential contingency measure at this time.

Comment Regarding IX.A.36
Chevron Products Company

Comment Summary A-2: Table IX.A.36.5 Point Source Emission Control Measurement Implementation Schedule and Compliance Mechanism lists “Replacement of 4 Compressor Drivers: as a BACT requirement for the Chevron Products Company. The Salt Lake Refinery believes this to be an error. The Salt Lake Refinery requests that “Replacement of 4 Compressor Drivers” be removed from the table.

UDAQ Response to Comment A-2: UDAQ will edit the table to reflect Chevron’s Approval Order.

Comment Regarding IX.A.27
McWane Ductile

Summary of Comment A-3: McWane Ductile (MDU) believes that UDAQ made a typographical error in identifying MDU’s VOC limits in the Maintenance Plan for Provo. On page 14, UDAQ identifies the RACT Equipment updates for MDU is "limiting VOC emissions" to "118.16 tons /yr." The tpy figure, however, is incorrect. The VOC limit as 118.16 tons per year: the VOC emission limit expressed in MDU’s Approval Order is 161.78 tons per year.

UDAQ Response to Comment A-3: UDAQ agrees with the commenter and will edit IX.A.27 accordingly.

Comments Regarding IX.A.28
Citizen Comments

Summary of Comment A-4: A commenter asked if there were any enforceable reductions that applied to the general public in the Logan area.

UDAQ Response to Comment A-4: The Cache County Inspection and Maintenance Program was implemented as part of the attainment strategy for the Logan area. This enforceable additional reasonable measure was approved by EPA and applies to any vehicle owner that registers a vehicle in Cache County, Utah.

Summary of Comment A-5: A commenter pointed out that there was not enough public awareness of the proposed maintenance SIP.

UDAQ Response to Comment A-5: By statute during rule proposal stage, UDAQ is required to send a copy of rule analysis to anyone who has requested it, to any person the agency is required by law to notify
(as a result of federal mandate or statute), or to any person who in the agency’s judgment is required to be notified. See Utah Code § 63G-3-301(10). The proposed rule is then published by the Office of Administrative Rules in the Utah State Bulletin, which is publicly available at https://rules.utah.gov/publications/utah-state-bull/. See id. § 63G-3-402. This is how the general public is notified of the proposed rules. UDAQ complied with these requirements.

In addition, Division of Air Quality staff sent out a notice of rulemaking actions by the Utah Air Quality Board by email on September 12th, multiple days before the 30-day public comment period began on October 1st. The email is available to those who sign up to receive it using the following google docs form: https://docs.google.com/forms/d/e/1FAIpQLSfVDtgNkUTHrJeRgqmrM2jKk7uZf1ZhDNeJiBymv8JlUFcaqCw/viewform. The email included a link to review the documents which were presented to the Board, which can be found at the following: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. Also included was a link to the state bulletin (as noted above) and a link to the Division of Air Quality website which brings the user to a webpage for current air quality rule and plan changes open for public comment (https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment).

Furthermore, the audio recording of the meeting and the packet were both available online on the Utah Public Notice website on September 6th. The final minutes were not available until October 7th as they had to be approved by the Board before becoming finalized. The information for each Board meeting can be found by going to https://utah.gov/pmn/index.html, clicking on “state”, then “Department of Environmental Quality”, then “Air Quality Board”. After that, the user is able to choose from the listed Board meetings on the website to find the information described earlier in this paragraph.

Summary of Comment A-6: A commenter agreed that emissions testing should be discontinued for the vehicles covered by the two-speed idle program because those emissions have minimal impact.

UDAQ Response to Comment A-6: UDAQ performed a 110(l) demonstration that supports this comment.

Summary of Comment A-7: A commenter would have appreciated a better summary of the proposed rulemaking and making the summary more accessible.

UDAQ Response to Comment A-7: The process of creating a maintenance plan is iterative. Multiple rules have been adopted and amended by the Air Quality Board over the years which were referenced in the maintenance plans. Those rules, since adopted and amended during different periods of time, were not available for public comment at the same time as the maintenance plans because they were already established rules at the time. All proposed rulemaking must follow the same legal process as outlined in the first paragraph of UDAQ Response to Comment A-5. Summaries for the specific maintenance plans are available in the Board memos which are included in the packets and can be found at two different locations on the DEQ website. The first location contains the documents for the entire September meeting: https://deq.utah.gov/air-quality/september-4-2019-agenda-air-quality. The second link will bring up only what is currently out for public comment. This is the link for the current rules and plans out for public comment: https://deq.utah.gov/air-quality/air-quality-rule-plan-changes-open-public-comment. Individuals are able to sign up to receive an email of advanced notice of rulemaking actions by the Board by going to the following form and inputting their information. https://docs.google.com/forms/d/e/1FAIpQLSfVDtgNkUTHrJeRgqmrM2jKk7uZf1ZhDNeJiBymv8JlUFcaqCw/viewform.
Summary of Comment A-8: A commenter was concerned that the removal of the two speed idle portion of the Inspection and Maintenance Program would allow for vehicles that had been getting registered across the border in Idaho to come back across the border and register in Utah since the emission testing would no longer apply.

UDAQ Response to Comment A-8: It is possible that older vehicles will be registered now in Utah instead of Franklin. However, the airshed they operate in is the same regardless of where they are registered. It is likely that these vehicles will be driving in the same areas as when they may have been registered in Idaho.

Summary of Comment A-9: A commenter was concerned that the air quality model results supporting this SIP do not project for population grown and exclude events outside of the State’s control, such as fires, which means that air quality standards may not be met in the future.

UDAQ Response to Comment A-9: Projection inventories used for air quality modeling include appropriate population growth. Each source category inventory deals with population growth depending on the latest data and population estimates. See the technical support documentation for specific source categories and how population growth was applied. The UDAQ follows the Treatment of Data Influenced by Exceptional Events set forth in 81 FR 68216 to determine if an event was out of the State’s control.
### Appendix 1: Regulatory Impact Summary Table

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**Net Fiscal Benefits:** $0 $0 $0

*This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.

### Appendix 2: Regulatory Impact to Non-Small Businesses

This rule change is not expected to have any fiscal impacts on non-small businesses revenues or expenditures, because the plan being incorporated into the rule shows how existing regulations will lead to the attainment of the PM2.5 air quality standard.

The Interim Executive Director of the Department of Environmental Quality, Scott Baird, has reviewed and approved this fiscal analysis.

**"Non-small business" means a business employing 50 or more persons; "small business" means a business employing fewer than 50 persons.**
KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: 2019
Notice of Continuation: January 27, 2017
Authorizing, and Implemented or Interpreted Law: 19-2-104
ITEM 6
MEMORANDUM

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Liam Thrailkill, Rules Coordinator

DATE: November 22, 2019


Utah Code 63G-3-305 requires each agency to review and justify each of its rules within five years of the rule’s original effective date or within five years of the filing of the last five-year review. This review process is not a time to revise or amend the rules, but only to verify that the rules are still necessary and allowed under state and federal law. As part of this process, we are required to identify any comments received since the last five-year review of each rule.

DAQ has completed a five-year review for each of the rules listed above in the subject line. No comments were received for the aforementioned rules. The results of these reviews are found in the attached Five-Year Notice of Review and Statement of Continuation forms.

Recommendation: Staff recommends that the Board continue these rules by approving the attached forms to be filed with the Office of Administrative Rules.
### General Information

2. **Rule catchline:**

   Administrative Procedures

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   The Utah Administrative Procedures Act (UAPA), Subsection 63G-4-102(6), allows state administrative agencies to enact rules "affecting or governing adjudicative proceedings," so long as the rules are adopted according to the Utah Administrative Rulemaking Act and conform to the requirements of UAPA. Rule R307-103 establishes administrative procedures that are tailored to DAQ's administrative needs and the needs of those affected by the agency's actions. The procedures in Rule R307-103 ensure consistency in the Division's administrative actions and give constitutional due process and fair notice to the regulated community and the public of their and DAQ's roles and responsibilities in the agency's actions.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   R307-103 has not been amended since the last 5-year review in February 2015. No comments have been received in that time period.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   Rule R307-103 sets forth administrative processes for the Division of Air Quality and the regulated community to ensure constitutional due process for the regulated community and the public, and should be continued.
Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

<table>
<thead>
<tr>
<th>Agency head or designee, and title:</th>
<th>Bryce Bird</th>
<th>Date (mm/dd/yyyy):</th>
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Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-103. Administrative Procedures.
R307-103-1. Administrative Procedures.

Administrative proceedings under Utah Air Quality Act are governed by Rule R305-7.

KEY: air pollution, administrative procedures, administrative proceedings, hearings
Date of Enactment or Last Substantive Amendment: August 29, 2011
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 63G-4
# State of Utah
## Administrative Rule Analysis
Revised October 2019

### FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

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### Agency Information

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<tbody>
<tr>
<td>Name:</td>
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<tr>
<td>Liam Thrailkill</td>
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Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:**

   Emission Testing.

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources…” One component of preventing air pollution is testing to ensure that control equipment is working properly.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   No comments have been submitted on this rule since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   R307-165 establishes the frequency of emission testing requirements for all areas in the state. Without periodic testing, there is no guarantee that pollution control equipment is working properly. Therefore, this rule should be continued.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-165-1. Purpose.

R307-165 establishes the frequency of emission testing requirements for all areas in the state.

R307-165-2. Testing Every 5 Years.

Emission testing is required at least once every five years of all sources with established emission limitations specified in approval orders issued under R307-401 or in section IX, Part H of the Utah state implementation plan. In addition, if the director has reason to believe that an applicable emission limitation is being exceeded, the director may require the owner or operator to perform such emission testing as is necessary to determine actual compliance status. Sources approved in accordance with R307-401 will be tested within six months of start-up. The Board may grant exceptions to the mandatory testing requirements of R307-165-2 that are consistent with the purposes of R307.

R307-165-3. Notification of DAQ.

At least 30 days prior to conducting any emission testing required under any part of R307, the owner or operator shall notify the director of the date, time and place of such testing and, if determined necessary by the director, the owner or operator shall attend a pretest conference.

R307-165-4. Test Conditions.

All tests shall be conducted while the source is operating at the maximum production or combustion rate at which such source will be operated. During the tests, the source shall burn fuels or combinations of fuels, use raw materials, and maintain process conditions representative of normal operations. In addition, the source shall operate under such other relevant conditions as the director shall specify.

R307-165-5. Rejection of Test Results.

The director may reject emissions test data if they are determined to be incomplete, inadequate, not representative of operating conditions specified for the test, or if the director was not provided an opportunity to have an observer present at the test.

KEY: air pollution, emission testing
Date of Enactment or Last Substantive Amendment: September 2, 2005
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)
### Agency Information

1. **Agency:** Department of Environmental Quality  
2. **Room no.:** Fourth Floor  
3. **Building:**  
   - **Street address:** 195 N 1950 W  
   - **City, state, zip:** Salt Lake City, UT 84116-3085  
4. **Mailing address:** PO Box 144820  
   - **City, state, zip:** Salt Lake City, UT 84116-3085  
5. **Contact person(s):**  
   - **Name:** Liam Thrailkill  
   - **Phone:** 801-536-4419  
   - **Email:** lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:** Emission Standards: General Emission Standards

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   - Subsection 19-2-104(1)(b) allows the Air Quality Board to make rules “establishing air quality standards.” Standards are needed to ensure that emissions of air pollution do not harm public health.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   - No comments have been received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   - Standards are needed to ensure that emissions of air pollution do not harm public health. This rule establishes emission standards statewide.

### Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-201-1. Purpose.
R307-201 establishes emission standards for all areas of the state except for sources listed in section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.

R307-201 applies statewide to any sources of emissions except for sources listed in section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.

(1) Visible emissions from installations constructed on or before April 25, 1971, except diesel engines, shall be of a shade or density no darker than 40% opacity, except as otherwise provided in these rules.
(2) Visible emissions from installations constructed after April 25, 1971, except diesel engines shall be of a shade or density no darker than 20% opacity, except as otherwise provided in these rules.
(3) Visible emissions for all incinerators, no matter when constructed, shall be of shade or density no darker than 20% opacity.
(4) No owner or operator of a gasoline powered engine or vehicle shall allow, cause or permit visible emissions.
(5) Emissions from diesel engines, except locomotives, manufactured after January 1, 1973, shall be of a shade or density no darker than 20% opacity, except for starting motion no farther than 100 yards or for stationary operation not exceeding three minutes in any hour.
(6) Emissions from diesel engines manufactured before January 1, 1973, shall be of a shade or density no darker than 40% opacity, except for starting motion no farther than 100 yards or for stationary operation not exceeding three minutes in any hour.
(7) Visible emissions exceeding the opacity standards for short time periods as the result of initial warm-up, soot blowing, cleaning of grates, building of boiler fires, cooling, etc., caused by start-up or shutdown of a facility, installation or operation, or unavoidable combustion irregularities which do not exceed three minutes in length (unavoidable combustion irregularities which exceed three minutes in length must be handled in accordance with R307-107), shall not be deemed in violation provided that the director finds that adequate control technology has been applied. The owner or operator shall minimize visible and non-visible emissions during start-up or shutdown of a facility, installation, or operation through the use of adequate control technology and proper procedures.
(8) Compliance Method. Emissions shall be brought into compliance with these requirements by reduction of the total weight of pollutants discharged per unit of time rather than by dilution of emissions with clean air.
(9) Opacity Observation. Opacity observations of emissions from stationary sources shall be conducted in accordance with EPA Method 9. Opacity observers of mobile sources and intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15 second intervals over a 6-minute period shall not apply.

Any person owning or operating any motor vehicle or motor vehicle engine registered or principally operated in the State of Utah on which is installed or incorporated a system or device for the control of crankcase emissions or exhaust emissions in compliance with the Federal motor vehicle rules, shall maintain the system or device in operable condition and shall use it at all times that the motor vehicle or motor vehicle engine is operated. No person shall remove or make inoperable the system or device or any part thereof, except for the purpose of installing another system or device, or part thereof, which is equally or more effective in reducing emissions from the vehicle to the atmosphere.

KEY: air pollution, PM10
Date of Enactment or Last Substantive Amendment: December 15, 2015
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-101; 19-2-104
State of Utah  
Administrative Rule Analysis  
Revised October 2019  

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<td>Filing No. (Office Use Only)</td>
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### Agency Information

1. **Agency:** Department of Environmental Quality  
2. **Room no.:** Fourth Floor  
3. **Building:**  
4. **Street address:** 195 N 1950 W  
5. **City, state, zip:** Salt Lake City, UT 84116-3085  
6. **Mailing address:** PO Box 144820  
7. **City, state, zip:** Salt Lake City, UT 84116-3085  

### Contact person(s):  
- **Name:** Liam Thrailkill  
- **Phone:** 801-536-4419  
- **Email:** lthrailkill@utah.gov  

Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:** Emission Standards: General Burning  

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources…” Rule R307-202 sets forth the conditions under which burning of yard clippings is allowed, forbids burning at community waste disposal sites, and the burning of trash or garbage, Rule R307-202 does not regulate fireplaces or outdoor grills.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   No comments have been received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   Rule R307-202 is necessary to specify time windows when local officials may allow burning for yard cleanup, and to set forth the kinds of burning for which permits are not needed; and should be continued. In addition, Rule R307-202 is a component of Utah’s State Implementation Plan, and cannot be deleted without EPA approval.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
   R307-202-4 through R307-202-8 applies to general burning within incorporated community under the authority of county or municipal fire authority.

   The following additional definitions apply only to R307-202.
   "Attainment areas" means any area that meets the national primary and secondary ambient air quality standard (NAAQS) for the pollutant.
   "County or municipal fire authority" means the public official so designated with the responsibility, authority, and training to protect people, property, and the environment from fire, within their respective area of jurisdiction.
   "Federal Class I Area" means an area that consists of national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence on August 7, 1977. See Clean Air Act section 162(a).
   "Fire hazard" means a hazardous condition involving combustible, flammable, or explosive material that represents a substantial threat to life or property if not immediately abated, as declared by the county or municipal fire authority.
   "Native American spiritual advisor" means a person who leads, instructs, or facilitates a Native American religious ceremony or service; or provides religious counseling; is an enrolled member of a federally recognized Native American tribe; and is recognized as a spiritual advisor by a federally recognized Native American tribe. "Native American spiritual advisor" includes a sweat lodge leader, medicine person, traditional religious practitioner, or holy man or woman.

   As provided in Section 19-2-114, the provisions of R307-202 are not applicable to:
   (1) Except for areas zoned as residential, burning incident to horticultural or agricultural operations of:
      (a) Prunings from trees, bushes, and plants; and
      (b) Dead or diseased trees, bushes, and plants, including stubble.
   (2) Burning of weed growth along ditch banks for clearing these ditches for irrigation purposes;
   (3) Controlled heating of orchards or other crops during the frost season to lessen the chances of their being frozen so long as the emissions from this heating do not cause or contribute to an exceedance of any national ambient air quality standards and is consistent with the federally approved State Implementation Plan; and
   (4) The controlled burning of not more than two structures per year by an organized and operating fire department for the purpose of training fire service personnel when the National Weather Service clearing index is above 500. See also Section 11-7-1(2)(a).
   (5) Ceremonial burning is excluded from R307-202-4(2) when conducted by a Native American spiritual advisor.

   (1) No open burning shall be done at sites used for disposal of community trash, garbage and other wastes.
   (2) No person shall burn under this rule when the director issues a public announcement under R307-302. The director will distribute such announcement to the local media notifying the public that a mandatory no-burn period is in effect for the area where the burning is to occur.

   (1) Except as otherwise provided in this rule, no person shall set or use an open outdoor fire for the purpose of disposal or burning of petroleum wastes; demolition or construction debris; residential rubbish; garbage or vegetation; tires; tar; trees; wood waste; other combustible or flammable solid, liquid or gaseous waste; or for metal salvage or burning of motor vehicle bodies.
   (2) The county or municipal fire authority shall approve burning based on the predicted meteorological conditions and whether the emissions would impact the health and welfare of the public or cause or contribute to an exceedance of any national ambient air quality standard.
   (3) Nothing in this regulation shall be construed as relieving any person conducting open burning from meeting the requirements of any applicable federal, state or local requirements concerning disposal of any combustible materials.
   (4) The county or municipal fire authority that approves any open burning permit will retain a copy of each permit issued for one year.

   The following types of open burning do not require a permit when not prohibited by other local, state or federal laws and regulations, when it does not create a nuisance, as defined in Section 76-10-803, and does not impact the health and welfare of the public.
   (1) Devices for the primary purpose of preparing food such as outdoor grills and fireplaces;
   (2) Campfires and fires used solely for recreational purposes where such fires are under control of a responsible person and the combustible material is clean, dry wood or charcoal; and
(3) Indoor fireplaces and residential solid fuel burning devices except as provided in R307-302-2.


(1) No person shall knowingly conduct open burning unless the open burning activities may be conducted without a permit pursuant to R307-202-6 or the person has a valid permit for burning on a specified date or period, issued by the county or municipal fire authority having jurisdiction in the area where the open burning will take place.

(2) A permit applicant shall provide information as requested by the county or municipal fire authority. No permit or authorization shall be deemed valid unless the issuing authority determines that the applicant has provided the required information.

(3) Persons seeking an open burning permit shall submit to the county or municipal fire authority an application on a form provided by the director for each separate burn.

(4) A permit shall be valid only on the lands specified on the permit.

(5) No material shall be burned unless it is clearly described and quantified as to material to be burned on a valid permit.

(6) No burning shall be conducted contrary to the conditions specified on the permit.

(7) Any permit issued by a county or municipal fire authority shall be subject to the local, state, and federal rules and regulations.

(8) Open burning is authorized by the issuance of a permit, as stipulated within this rule, for specification in R307-202-7(10). These permits can only be issued when not prohibited by other local, state, or federal laws and regulations and when a nuisance as defined in Section 76-10-803 is not created and does not impact the health and welfare of the public.

(9) Individual permits, as stipulated within this rule, for the types of burning listed in R307-202-7(10) may be issued by a county or municipal fire authority when the clearing index is 500 or greater. When the clearing index is below 500, all permits issued for that day will be null and void until further notice from the county or municipal fire authority. Additionally, anyone burning on the day when the clearing index is below 500 or is found to be violating any part of this rule shall be liable for a fine in accordance with R307-130.

(10) Types of open burning for which a permit may be granted are:

(a) Except in nonattainment and maintenance areas, open burning of tree cuttings and slash in forest areas where the cuttings accrued from pulping, lumbering, and similar operations, but excluding waste from sawmill operations such as sawdust and scrap lumber.

(b) Open burning of trees and brush within railroad rights-of-way provided that dirt is removed from stumps before burning, and that tires, oil more dense than No. 2 fuel oil, tar, or other materials which can cause severe air pollution are not present in the materials to be burned, and are not used to start fires or to keep fires burning.

(c) Open burning of a fire hazard that a county or municipal fire authority determines cannot be abated by any other viable option.

(d) Open burning of highly explosive materials when a county or municipal fire authority, law enforcement agency or governmental agency having jurisdiction determines that onsite burning or detonation in place is the only reasonably available method for safely disposing of the material.

(e) Open burning for the disposal of contraband in the possession of public law enforcement personnel provided they demonstrate to the county or municipal fire authority that open burning is the only reasonably available method for safely disposing of the material.

(f) Open burning of clippings, bushes, plants and prunings from trees incident to property clean-up activities, including residential cleanup, provided that the following conditions have been met:

(i) Within only the counties of Washington, Kane, San Juan, Iron, Garfield, Beaver, Piute, Wayne, Grand and Emery, the county or municipal fire authority may issue a permit between March 1 and May 30 when the clearing index is 500 or greater. The county or municipal fire authority may issue a permit between September 15 to November 15 for such burning to occur when the state forester has approved the burning window under Section 65A-8-211 and the clearing index is 500 or greater.

(ii) In all other areas of the state, the county or municipal fire authority may issue a permit between March 30 and May 30 for such burning to occur when the clearing index is 500 or greater. The county or municipal fire authority may issue a permit between September 15 and October 30 for such burning to occur when the state forester has approved the burning window under Section 65A-8-211 and the clearing index is 500 or greater.

(iii) Such burnings occur in accordance with state and federal requirements;

(iv) Materials to be burned are thoroughly dry; and

(v) No trash, rubbish, tires, or oil are included in the material to be burned, used to start fires, or used to keep fires burning.

(g) Except for nonattainment and maintenance areas, the director may grant a permit for types of open burning not specified in R307-202-7(3) on written application if the director finds that the burning is consistent with the federally approved State Implementation Plan and does not cause or contribute to an exceedance of any national ambient air quality standards.

(i) This permit may be granted once the director has reviewed the written application with the requirements and criteria found within this rule at R307-202-7.

(ii) Open Burning Permit Criteria.

(A) The director or the county or municipal fire authority shall consider the following factors in determining whether, and upon what conditions, to issue an open burning permit:

(I) The location and proximity of the proposed burning to any building, other structures, the public, and federal Class I areas that might be impacted by the smoke and emissions from the burn;

(II) Burning will only be conducted when the clearing index is 500 or above; and

(III) Whether there is any practical alternative method for the disposal of the material to be burned.
(B) Methods to minimize emissions and smoke impacts may include, but are not limited to:
(I) The use of clean auxiliary fuel;
(II) Drying the material prior to ignition; and
(III) Separation for alternative disposal of materials that produce higher levels of emissions and smoke during the combustion process.
(C) Open burning permits are not valid during periods when the clearing index is below 500 or publicly announced air pollution emergencies or alerts have been declared in the area of the proposed burn.
(D) For burns of piled material, all piles shall be reasonably dry and free of dirt.
(E) Open burns shall be supervised by a responsible person who shall notify the local fire department and have available, either on-site or by the local fire department, the means to suppress the burn if the fire does not comply with the terms and conditions of the permit.
(F) All open burning operations shall be subject to inspection by the director or county or municipal fire authority. The permittee shall maintain at the burn site the original or a copy of the permit that shall be made available without unreasonable delay to the inspector.
(G) If at any time the director or the county or municipal fire authority granting the permit determines that the permittee has not complied with any term or condition of the permit, the permit is subject to partial or complete suspension, revocation or imposition of additional conditions. All burning activity subject to the permit shall be terminated immediately upon notice of suspension or revocation. In addition to suspension or revocation of the permit, the director or county or municipal fire authority may take any other enforcement action authorized under state or local law.

(1) Open burning for special purposes or under unusual or emergency circumstances may be approved by the director if it is consistent with the federally approved State Implementation Plan and does not cause or contribute to an exceedance of any national ambient air quality standards.
  (a) This permit may be granted once the director has reviewed the written application with the requirements and criteria in R307-202-7.

KEY: air pollution, open burning, fire authority
Date of Enactment or Last Substantive Amendment: October 6, 2014
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104; 11-7-1(2)(a); 65A-8-211; 76-10-803
**FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION**

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### Agency Information

1. **Agency:** Department of Environmental Quality  
2. **Room no.:** Fourth Floor  
3. **Building:**  
4. **Street address:** 195 N 1950 W  
5. **City, state, zip:** Salt Lake City, UT 84116-3085  
6. **Mailing address:** PO Box 144820  
7. **City, state, zip:** Salt Lake City, UT 84116-3085  

**Contact person(s):**  
- **Name:** Liam Thrailkill  
- **Phone:** 801-536-4419  
- **Email:** lthrailkill@utah.gov  

*Please address questions regarding information on this notice to the agency.*

### General Information

2. **Rule catchline:**  
   Emission Standards: Sulfur Content of Fuels

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   Rule R307-203 establishes the maximum amount of sulfur that may be contained in coal and oil burned in industrial processes and residential heating, thus holding down the emissions of sulfur dioxide from these processes. Subsection 19-2-104(1)(a) authorizes the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.”

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   No written comments have been received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   Sulfur dioxide is harmful to human health, which is the basis for EPA’s listing of sulfur dioxide as a principal pollutant. Without this rule, users could burn coal or oil with higher sulfur content, thus emitting more sulfur dioxide into the atmosphere. In addition, Rule R307-203 is a component of Utah’s State Implementation Plan, and cannot be deleted without EPA approval.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.

R307-203-1. Commercial and Industrial Sources.

(1) Any coal, oil, or mixture thereof, burned in any fuel burning or process installation not covered by New Source Performance Standards for sulfur emissions shall contain no more than 1.0 pound sulfur per million gross BTU heat input for any mixture of coal nor .85 pounds sulfur per million gross BTU heat input for any oil.

(a) In the case of fuel oil, it shall be sufficient to record the following specifications for each purchase of fuel oil from the vendor: weight percent sulfur, gross heating value (btu per unit volume), and density. These parameters shall be ascertained in accordance with the methods of the American Society for Testing and Materials.

(b) In the case of coal, it shall be necessary to obtain a representative grab sample for every 24 hours of operation and the sample shall be tested in accordance with the methods of the American Society for Testing and Materials.

(c) All sources located in the SO2 nonattainment area covered by Section IX, Part H of the Utah State Implementation Plan which are required to comply with specific fuel (oil or coal) sulfur content limitations must demonstrate compliance with their limitations in accordance with (a) and (b) above.

(d) Records of fuel sulfur content shall be kept for all periods when the plant is in operation and shall be made available to the director upon request, and shall include a period of two years ending with the date of the request.

(e) If the owner/operator of the source can demonstrate to the director that the inherent variability of the coal they are receiving from the vendor is low enough such that the testing requirements outlined above may be deemed excessive, then an alternative testing plan may be approved for use with the same source of coal.

(f) Any person may apply to the director for approval of an alternative test method, an alternative method of control, an alternative compliance period, an alternative emission limit, or an alternative monitoring schedule. The application must include a demonstration that the proposed alternative produces an equal or greater air quality benefit than that required by R307-203, or that the alternative test method is equivalent to that required by R307-203. The director shall obtain concurrence from EPA when approving an alternative test method, an alternative method of control, an alternative compliance period, an alternative emission limit, or an alternative monitoring schedule.

(2) Any person engaged in operating fuel burning equipment using coal or fuel oil, which is not covered by New Source Performance Standards for sulfur emissions, may apply for an exemption from the sulfur content restrictions of (1) above. The applicant shall furnish evidence, that the fuel burning equipment is operating in such a manner as to prevent the emission of sulfur dioxide in amounts greater than would be produced under the limitations of (1) above. Control apparatus to continuously prevent the emission of sulfur greater than provided by (1) above must be specified in the application for an exemption.

(3) In case an exemption is granted, the operator shall install continuous emission monitoring devices approved by the director. The operator shall provide the director with a monthly summary of the data from such monitors. This summary shall be such as to show the degree of compliance with (1) above. It shall be submitted no later than the calendar month succeeding its recording. When exemptions from (1) above are granted, the source's application for such exemption must specify the test method for determining sulfur emissions. The test method must agree with the NSPS test method for the same industrial category.

(4) Methods for determining sulfur content of coal and fuel oil shall be those methods of the American Society for Testing and Materials.

(a) For determining sulfur content in coal, ASTM Methods D3177-75 or D4239-85 are to be used.

(b) For determining sulfur content in oil, ASTM Methods D2880-71 or D4294-89 are to be used.

(c) For determining the gross calorific (or BTU) content of coal, ASTM Methods D2015-77 or D3286-85 are to be used.

R307-203-2. Sulfur and Ash Content of Coal for Residential Use.

(1) After July 1, 1987, no person shall sell, distribute, use or make available for use any coal or coal containing fuel for direct space heating in residential solid fuel burning devices and fireplaces which exceeds the following limitations as measured by the American Society for Testing Materials Methods:

(a) 1.0 pound sulfur per million BTU’s, and

(b) 12% volatile ash content.

(2) Any person selling coal or coal containing fuel used for direct residential space heating within the State of Utah shall provide written documentation to the coal consumer of the sulfur and volatile ash content of the coal being purchased.


Other provisions of R307 may require more stringent controls than listed herein, in which case those requirements must be met.

KEY: air pollution, fuel composition*, fuel oil*
Date of Enactment or Last Substantive Amendment: September 15, 1998
Notice of Continuance: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104
# Five-Year Notice of Review and Statement of Continuation

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   **Room no.:** Fourth Floor  
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   **Mailing address:** PO Box 144820  
   **City, state, zip:** Salt Lake City, UT 84116-3085  

**Contact person(s):**  
**Name:** Liam Thrailkill  
**Phone:** 801-536-4419  
**Email:** lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

## General Information

2. **Rule catchline:** Emission Standards: Smoke Management

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules "...regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source." Rule R307-204 protects the public health by controlling the release and impact of particulate pollution associated with prescribed and controlled fires in the State of Utah. Rule R307-204 also describes the operational procedures to follow when prescribed fires, wildland fires, or wildland fire use events take place on specific lands in Utah owned or managed by state and federal land management agencies. Rule R307-204 does not apply to agricultural activities specified in Section 19-2-114.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   One substantive amendment was made to R307-204 in 2019 (OAR#43808) to include requirements established by the Legislature set forth in 2019 House Bill 155. Other proposed amendments were put forward to reduce redundancies, eliminate outdated portions, and streamline the rule. No comments were received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   Rule R307-204 protects the public health by controlling the release and impact of particulate pollution associated with prescribed and controlled fires in the State of Utah. Smoke has become a dominant public complaint, supporting the need for this regulation. Therefore, this rule should be continued. Additionally, R307-204 is a component of Utah’s State Implementation Plan, and it cannot be deleted without EPA approval.
Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-204. Emission Standards: Smoke Management.
R307-204-1. Purpose and Goals.
  (1) The purpose of R307-204 is to establish by rule procedures that mitigate the impacts on air quality and visibility from prescribed fire.

  (1) R307-204 applies to all persons using prescribed fire on land they own or manage.
  (2) R307-204 does not apply to agricultural activities specified in 19-2-114 and to those regulated under R307-202, or to activities otherwise permitted under R307.

The following additional definitions apply only to R307-204.
"Annual Emissions Goal" means the annual establishment of a planned quantitative value of emissions reductions from prescribed fire.
"Best Management Practices" means smoke management and dispersion techniques used during a prescribed fire that affect the direction, duration, height or density of smoke.
"Burn Window" means the period of time during which the prescribed fire is scheduled for ignition.
"Emission Reduction Techniques (ERT)" mean techniques for controlling emissions from prescribed fires to minimize the amount of emission output per unit or acre burned.
"Federal Class I Area" means any Federal land that is federally classified or reclassified Class I.
"Land Manager" means any federal, state, local or private entity that owns, administers, directs, oversees or controls the use of public or private land, including the application of fire to the land.
"Non-burning Alternatives to Fire" means non-burning techniques that are used to achieve a particular land management objective, including but not limited to reduction of fuel loading, manipulation of fuels, enhancement of wildlife habitat, and ecosystem restructuring. These alternatives are designed to replace the use of fire for at least five years.
"Nonfull suppression event" means a naturally ignited wildland fire (wildfire) for which a land manager secures less than full suppression to accomplish a specific prestated resource management objective in a predefined geographic area.
"Particulate Matter" means the liquid or solid particles such as dust, smoke, mist, or smog found in air emissions.
"Pile" means natural materials or debris resulting from some type of fuels management practice that have been relocated either by hand or machinery into a concentrated area.
"Pile Burn" means burning of individual piles.
"Prescribed Fire or Prescribed Burn" means a wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan.
"Prescribed Fire Plan" means the plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate agency administrator prior to implementation. Each plan follows specific agency direction and must include critical elements described in agency manuals.
"Prescription" means the measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicates other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.
"Smoke Sensitive Receptors" means population centers such as towns and villages, campgrounds and trails, hospitals, nursing homes, schools, roads, airports, Class I areas, nonattainment and maintenance areas, areas whose air quality monitoring data indicate pollutant levels that are close to health standards, and any other areas where smoke and air pollutants can adversely affect public health, safety and welfare.
"Wildfire" means unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires.
"Wildland" means an area in which development is essentially non-existent, except for pipelines, power lines, roads, railroads, or other transportation or conveyance facilities. Structures, if any, are widely scattered.
"Wildland Fire" means any non-structure fire that occurs in the wildland.

  (1) Management of On-Going Fires. The land manager shall notify the Division of all wildfires, including nonfull suppression events. If, after consultation with the land manager, the Director determines that a prescribed fire, wildfire, or any smoke transported from other locations, is degrading air quality to levels that could violate the National Ambient Air Quality Standards or burn plan conditions, the land manager shall promptly stop igniting additional prescribed fires.
  (2) Non-burning Alternatives to Fire. Each land manager shall submit to the Director annually, by March 15, a list of areas treated using non-burning alternatives to fire during the previous calendar year, including the number of acres, the specific types of alternatives used, and the location of these areas.
  (3) Annual Emissions Goal. The Director shall provide an opportunity for an annual meeting with land managers for the purpose of evaluation and adoption of the annual emission goal. The annual emission goal shall be developed in cooperation with states, federal
land management agencies and private entities, to control prescribed fire emissions increases to the maximum feasible extent.

(4) Long-term Fire Projections. Each land manager shall provide to the Director by March 15 annually long-term projections of future prescribed fire activity for annual assessment of visibility impairment.

R307-204-5. Burn Schedule.
(1) Any land manager planning prescribed fire burning more than 50 acres per year shall submit a burn schedule to the Director on forms provided by the Division, and shall include the following information for all prescribed fires including those smaller than 20 acres:
   (a) Project name and de minimis status;
   (b) Latitude and longitude;
   (c) Acres for the year, fuel type, and planned use of emission reduction techniques to support establishment of the annual emissions goal; and
   (d) Expected burn dates and burn duration.
(2) Each land manager shall submit each year's burn schedule no later than March 15 of that year.
(3) Any land manager who makes changes to the burn schedule shall submit an amendment to the burn schedule within 10 days after the change.

(1) A prescribed fire that covers less than 20 acres per burn or less than 30,000 cubic feet of piled material shall only be ignited either when the clearing index is 500 or greater or when the clearing index is between 400 and 499, if;
   (a) The prescribed fire is recorded as a de minimis prescribed fire on the annual burn schedule;
   (b) The land manager obtains approval from the Director by e-mail or phone prior to ignition of the burn; and
   (c) The land manager submits to the Director hourly photographs, a record of any complaints, hourly meteorological conditions and an hourly description of the smoke plume.

R307-204-7. Large Prescribed Fires.
(1) For a prescribed fire that covers 20 acres or more per burn or 30,000 cubic feet of piled material or more, the land manager shall submit to the Director a prescribed fire plan at least one week before the beginning of the burn window. The plan shall include a prescription and description of other state, county, municipal, or federal resources available on scene, or for contingency purposes.
(2) The land manager shall submit pre-burn information to the Director at least two weeks before the beginning of the burn window. The pre-burn information shall be submitted to the Director on the appropriate form provided by the Division and shall include the following information:
   (a) The project name, total acres, and latitude and longitude;
   (b) Summary of ignition method, burn type, and burn objectives, such as restoration or maintenance of ecological functions or hazardous fuel reduction;
   (c) Any sensitive receptor within 15 miles, including any Class I or nonattainment or maintenance area, and distance and direction in degrees from the project site;
   (d) The smoke dispersion or visibility model used and results;
   (e) The estimated amount of total particulate matter anticipated;
   (f) A description of how the public and land managers in neighboring states will be notified;
   (g) A map depicting both the daytime and nighttime smoke path and down-drainage flow for a minimum of 15 miles from the burn site with smoke-sensitive areas delineated;
   (h) Safety and contingency plans for addressing any smoke intrusions;
   (i) Planned use of emission reduction techniques to support establishment of an annual emissions goal, if not already submitted under R307-204-5; and
   (j) Any other information needed by the Director for smoke management purposes, or for assessment of contribution to visibility impairment in any Class I area.
(3) Burn Request.
   (a) The land manager shall submit to the Director a burn request on the form provided by the Division by 1000 hours at least two business days before the planned ignition time. The form must include the following information:
      (i) The project name;
      (ii) The date submitted and by whom;
      (iii) The burn manager conducting the burn and phone numbers; and
      (iv) The dates of the requested burn window.
   (b) No large prescribed fire shall be ignited before the Director approves the burn request.
   (c) If a prescribed fire is delayed, changed or not completed following burn approval, any significant changes in the burn plan shall be submitted to the Director before the burn request is submitted.
(4) Daily Emissions Report. By 0800 hours on the day following the prescribed fire, for each day of prescribed fire activity covering 20 acres or more, the land manager shall submit to the Director a daily emission report on the form provided by the Division including the following information:
(a) Project name;
(b) The date submitted and by whom;
(c) The start and end dates and times of the burn;
(d) Emission information, to include total affected acres, black acres, tons fuel consumed per acre, and tons particulate matter produced;
(e) Public interest regarding smoke;
(f) Daytime smoke behavior;
(g) Nighttime smoke behavior;
(h) Emission reduction techniques applied; and
(i) Evaluation of the techniques used by the land manager to reduce emissions or manage the smoke from the prescribed burn.

(5) Emission Reduction and Dispersion Techniques. Each land manager shall take measures to prevent smoke impacts. Such measures may include best management practices such as dilution, emission reduction or avoidance in addition to others described in the pre-burn information form provided by the Division. An evaluation of the techniques shall be included in the daily emissions report required by (4) above.

(6) Monitoring. Land managers shall monitor the effects of the prescribed fire on smoke sensitive receptors and on visibility in Class I areas, as directed by the burn plan. Hourly visual monitoring and documentation of the direction of the smoke plume shall be recorded on the form provided by the Division or on the land manager's equivalent form. Complaints from the public shall be noted in the land managers project file. Records shall be available for inspection by the Director for six months following the end of the fire.

KEY: air quality, prescribed fire, smoke
Date of Enactment or Last Substantive Amendment: September 5, 2019
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)
State of Utah  
Administrative Rule Analysis  
Revised October 2019

<table>
<thead>
<tr>
<th>Title No. - Rule No.</th>
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<tr>
<td>Utah Admin. Code Ref (R no.): R307-205</td>
</tr>
</tbody>
</table>

**Agency Information**

1. **Agency:**  
   Department of Environmental Quality

   **Room no.:**  
   Fourth Floor

   **Building:**

   **Street address:**  
   195 N 1950 W

   **City, state, zip:**  
   Salt Lake City, UT 84116-3085

   **Mailing address:**  
   PO Box 144820

   **City, state, zip:**  
   Salt Lake City, UT 84116-3085

   **Contact person(s):**

   **Name:** Liam Thrailkill  
   **Phone:** 801-536-4419  
   **Email:** lthrailkill@utah.gov

   Please address questions regarding information on this notice to the agency.

**General Information**

2. **Rule catchline:**

   Emission Standards: Fugitive Emissions and Fugitive Dust

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   The Air Quality Board is required by Subsection 19-2-101(2) to “…achieve and maintain levels of air quality which will protect human health and safety…” In addition, Subsection 19-2-104(1)(a) allows the Board to make rules “regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source…” Also, Subsection 19-2-09(2)(a) allows the Board to “establish emission control requirements by rule that in its judgment may be necessary to prevent, abate, or control air pollution that may be statewide or may vary from area to area, taking into account varying local conditions.” Finally, Subsection 19-2-104(3)(e) allows the Board to “…prepare and develop a comprehensive plan or plans for the prevention, abatement, and control of air pollution in this state.”

   Rule R307-205 protects the public health by reducing emissions from industries, gravel pits, constructions sites, haul trucks, mines, and tailings ponds, as authorized by the above statutes.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   No comments were received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   Rule R307-205 reduces emissions from industries, gravel pits, construction sites, haul trucks, mines, and tailings ponds. In addition, dust complaints make up a significant portion of complaints received by the Division of Air Quality. Therefore, this rule should be continued.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

<table>
<thead>
<tr>
<th>Agency head or designee, and title:</th>
<th>Bryce Bird</th>
<th>Date (mm/dd/yyyy):</th>
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**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
Environmental Quality, Air Quality.


R307-205-1. Purpose.

R307-205 establishes minimum work practices and emission standards for sources of fugitive emissions and fugitive dust for sources located in all areas in the state except those listed in section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.


R307-205 applies statewide to all sources of fugitive emissions and fugitive dust, except for agricultural or horticultural activities specified in 19-2-114(1)-(3) and any source listed in section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.


The following definition applies throughout R307-205:

"Material" means sand, gravel, soil, minerals or other matter that may create fugitive dust.


Fugitive emissions from sources which were constructed on or before April 25, 1971, shall not exceed 40% opacity. Fugitive emissions from sources constructed or modified after April 25, 1971, shall not exceed 20% opacity.

R307-205-5. Fugitive Dust.

(1) Storage and Handling of Materials. Any person owning, operating or maintaining a new or existing material storage, handling or hauling operation shall minimize fugitive dust from such an operation. Such control may include the use of enclosures, covers, stabilization or other equivalent methods or techniques as approved by the director.

(2) Construction and Demolition Activities.

(a) Any person engaging in clearing or leveling of land greater than one-quarter acre in size, earthmoving, excavation, or movement of trucks or construction equipment over cleared land greater than one-quarter acre in size or access haul roads shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization of potential fugitive dust sources or other equivalent methods or techniques approved by the director.

(b) The owner or operator of any land area greater than one-quarter acre in size that has been cleared or excavated shall take measures to prevent fugitive particulate matter from becoming airborne. Such measures may include:

(i) planting vegetative cover,
(ii) providing synthetic cover,
(iii) watering,
(iv) chemical stabilization,
(v) wind breaks, or
(vi) other equivalent methods or techniques approved by the director.

(c) Any person engaging in demolition activities including razing homes, buildings, or other structures or removing paving material from roads or parking areas shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization or other equivalent methods or techniques approved by the director.


(1) The director may require persons owning, operating or maintaining any new or existing road, or having right-of-way easement or possessory right to use the same, to supply traffic count information as determined necessary to ascertain whether or not control techniques are adequate or additional controls are necessary.

(2) Any person who deposits materials that may create fugitive dust on a public or private paved road shall clean the road promptly.


(1) Fugitive dust, construction activities, and roadways associated with mining activities are regulated under the provisions of R307-205-7 and not by R307-205-5 and 6.

(2) Any person who owns or operates a mining operation shall minimize fugitive dust as an integral part of site preparation, mining activities, and reclamation operations.

(3) The fugitive dust control measures to be used may include:

(a) periodic watering of unpaved roads,
(b) chemical stabilization of unpaved roads,
(c) paving of roads,
(d) prompt removal of coal, rock minerals, soil, and other dust-forming debris from roads and frequent scraping and compaction of unpaved roads to stabilize the road surface,
(e) restricting the speed of vehicles in and around the mining operation,
(f) revegetating, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are a source of fugitive dust,
(g) restricting the travel of vehicles on other than established roads,
(h) enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, to minimize loss of material to wind and spillage,
(i) substitution of conveyor systems for haul trucks and covering of conveyor systems when conveyed loads are subject to wind erosion,
(j) minimizing the area of disturbed land,
(k) prompt revegetation of regraded lands,
(l) planting of special windbreak vegetation at critical points in the permit area,
(m) control of dust from drilling, using water sprays, hoods, dust collectors or other controls approved by the director,
(n) restricting the areas to be blasted at any one time,
(o) reducing the period of time between initially disturbing the soil and revegetating or other surface stabilization,
(p) restricting fugitive dust at spoil and coal transfer and loading points,
(q) control of dust from storage piles through use of enclosures, covers, or stabilization and other equivalent methods or techniques as approved by the director, or
(r) other techniques as determined necessary by the director.


(1) Fugitive dust, construction activities, and roadways associated with tailings piles and ponds are regulated under the provisions of R307-205-8 and not by R307-205-5 and 6.
(2) Any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities. Such controls may include:
   (a) watering,
   (b) chemical stabilization,
   (c) synthetic covers,
   (d) vegetative covers,
   (e) wind breaks,
   (f) minimizing the area of disturbed tailings,
   (g) restricting the speed of vehicles in and around the tailings operation, or
   (h) other equivalent methods or techniques which may be approvable by the director.

KEY: air pollution, fugitive emissions, mining, tailings
Date of Enactment or Last Substantive Amendment: July 7, 2005
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-101; 19-2-104;
# State of Utah
## Administrative Rule Analysis
### Revised October 2019

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<thead>
<tr>
<th>FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION</th>
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<tr>
<td>Title No. - Rule No.</td>
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<tr>
<td>Utah Admin. Code Ref (R no.): R307-206</td>
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### Agency Information

1. **Agency:** Department of Environmental Quality  
   - **Room no.:** Fourth Floor  
   - **Building:**  
   - **Street address:** 195 N 1950 W  
   - **City, state, zip:** Salt Lake City, UT 84116-3085  
   - **Mailing address:** PO Box 144820  
   - **City, state, zip:** Salt Lake City, UT 84116-3085  
   - **Contact person(s):**  
     - **Name:** Liam Thrailkill  
     - **Phone:** 801-536-4419  
     - **Email:** lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:** Emission Standards: Abrasive Blasting

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**
   
   R307-206 sets forth performance standards and maximum concentration of contaminants allowed in the air for operations that clean or prepare a surface by forcefully propelling a stream of abrasive material against the surface. Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.”

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**
   
   Two revisions were made in 2015 due to edits from HB 229 (OAR#39747 and #39748). No comments have been received since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**
   
   This rule protects the health of citizens when abrasive blasting operations are underway and should be continued. In addition, this rule is a component of Utah’s State Implementation Plan (SIP), and it cannot be deleted from the SIP without EPA approval.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

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**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-206 establishes work practice and emission standards for abrasive blasting operations for sources located statewide except for those sources listed in section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.


(1) The following additional definitions apply to R307-206:

"Abrasive Blasting" means the operation of cleaning or preparing a surface by forcibly propelling a stream of abrasive material against the surface.

"Abrasive Blasting Equipment" means any equipment utilized in abrasive blasting operations.

"Confined Blasting" means any abrasive blasting conducted in an enclosure which significantly restricts air pollutants from being emitted to the ambient atmosphere, including but not limited to shrouds, tanks, drydocks, buildings and structures.

"Multiple Nozzles" means a group of two or more nozzles being used for abrasive cleaning of the same surface in such close proximity that their separate plumes are indistinguishable.

"Unconfined Blasting" means any abrasive blasting which is not confined blasting as defined above.


R307-206 applies statewide to any abrasive blasting operation, except for any source that is listed in Section IX, Part H of the state implementation plan or that is located in a PM10 nonattainment or maintenance area.


Visible emissions from abrasive blasting operations shall not exceed 40% opacity, except for an aggregate period of three minutes in any one hour.


(1) Visible emissions shall be measured using EPA Method 9. Visible emissions from intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15 second intervals over a six-minute period shall not apply.

(2) Visible emissions from unconfined blasting shall be measured at the densest point of the emission after a major portion of the spent abrasive has fallen out, at a point not less than five feet nor more than twenty-five feet from the impact surface from any single abrasive blasting nozzle.

(3) An unconfined blasting operation that uses multiple nozzles shall be considered a single source unless it can be demonstrated by the owner or operator that each nozzle, measured separately, meets the emission and performance standards provided in R307-206-2 through 4.

(4) Visible emissions from confined blasting shall be measured at the densest point after the air pollutant leaves the enclosure.

KEY: air pollution, abrasive blasting, PM10
Date of Enactment or Last Substantive Amendment: December 15, 2015
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)
# FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

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## Agency Information

1. **Agency:**
   Department of Environmental Quality

2. **Room no.:**
   Fourth Floor

3. **Building:**

4. **Street address:**
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5. **City, state, zip:**
   Salt Lake City, UT 84116-3085

6. **Mailing address:**
   PO Box 144820

7. **City, state, zip:**
   Salt Lake City, UT 84116-3085

8. **Contact person(s):**
   Liam Thrailkill
   Phone: 801-536-4419
   Email: lthrailkill@utah.gov

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### General Information

2. **Rule catchline:**
   Emission Standards: Residential Fireplaces and Stoves

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   Rule R307-207 establishes visible emission from residential solid fuel burning devices and fireplaces. The Air Quality Board is required by Subsection 19-2-101(2) to “…achieve and maintain levels of air quality which will protect human health and safety…” In addition, Subsection 19-2-104(1)(a) allows the Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum air quantity of air contaminants that may be emitted by any air contaminant source…”

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   No comments were received regarding R307-207 since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   Rule R307-207 establishes visible emission standards necessary to control PM10 throughout Utah. In addition, this rule is a component of Utah’s State Implementation Plan (SIP), and it cannot be deleted from the SIP without the EPA’s approval. Therefore, this rule should be continued.
### Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

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**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-207-1. Purpose and Definition.
   R307-207 establishes emission standards for residential fireplaces and solid fuel burning devices.
   "Solid fuel burning device" means any device used for burning wood, coal, or any other nongaseous and non-liquid fuel, including, but not limited to, wood stoves, but excluding outdoor wood boilers, which are regulated under R307-208.

   (1) R307-207 applies to residential fireplaces and solid fuel burning devices in all areas of the state, except for PM10 and PM2.5 nonattainment and maintenance areas. R307-302 applies to PM10 and PM2.5 nonattainment or maintenance areas.

   Visible emissions from residential solid fuel burning devices and fireplaces shall be limited to a shade or density no darker than 20% opacity as measured by EPA Method 9, except for the following:
   (1) An initial fifteen minute start-up period, and
   (2) A period of fifteen minutes in any three-hour period in which emissions may exceed the 20% opacity limitation for refueling.

KEY: fireplaces, residential, solid fuel burning
Date of Enactment or Last Substantive Amendment: November 8, 2012
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-101; 19-2-104
State of Utah  
Administrative Rule Analysis  
Revised October 2019

FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

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Agency Information

1. Agency: Department of Environmental Quality
2. Room no.: Fourth Floor
3. Building:
4. Street address: 195 N 1950 W
5. City, state, zip: Salt Lake City, UT 84116-3085
6. Mailing address: PO Box 144820
7. City, state, zip: Salt Lake City, UT 84116-3085
8. Contact person(s):
   - Name: Liam Thrailkill
   - Phone: 801-536-4419
   - Email: lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

General Information

2. Rule catchline:
   Nonattainment and Maintenance Areas for PM10: Emission Standards.

3. A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:
   Rule R307-305 sets visible emission limits, testing methods and schedules, and compliance schedules for sources of air pollution that are regulated under Utah’s PM10 state implementation plan to protect public health. Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.”

4. A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:
   There have been no comments on this rule since the last five-year review.

5. A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:
   Emission limits and testing of emissions, which this rule outlines, help to ensure that industrial facilities are operating properly and emitting the least possible pollution to protect human health. Additionally, R307-305 is a component of Utah’s State Implementation Plan and cannot be deleted without EPA approval. Therefore, this rule should be continued.

Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

Agency head or designee, and title: Bryce Bird  
Date (mm/dd/yyyy): 11/20/2019

Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.

R307-305-1. Purpose.
This rule establishes emission standards and work practices for sources located in PM10 nonattainment and maintenance areas to meet the reasonably available control measures requirement in section 189(a)(1)(C) of the Act.

The requirements of R307-305 apply to the owner or operator of any source that is listed in Section IX, Part H of the state implementation plan or located in a PM10 nonattainment or maintenance area.

(1) Visible emissions from existing installations except diesel engines shall be of a shade or density no darker than 20% opacity. Visible emissions shall be measured using EPA Method 9.
(2) No owner or operator of a gasoline engine or vehicle shall allow, cause or permit the emissions of visible pollutants.
(3) Emissions from diesel engines, except locomotives, shall be of a shade or density no darker than 20% opacity, except for starting motion no farther than 100 yards or for stationary operation not exceeding three minutes in any hour.
(4) Visible emissions exceeding the opacity standards for short time periods as the result of initial warm-up, soot blowing, cleaning of grates, building of boiler fires, cooling, etc., caused by start-up or shutdown of a facility, installation or operation, or unavoidable combustion irregularities which do not exceed three minutes in length (unavoidable combustion irregularities which exceed three minutes in length must be handled in accordance with R307-107), shall not be deemed in violation provided that the director finds that adequate control technology has been applied. The owner or operator shall minimize visible and non-visible emissions during start-up or shutdown of a facility, installation, or operation through the use of adequate control technology and proper procedures.

R307-305-4. Particulate Emission Limitations and Operating Parameters (PM10).
Any source with emission limits included in Section IX, Part H of the Utah state implementation plan shall comply with those emission limitations and operating parameters. Specific limitations will be set by the director, through an approval order issued under R307-401, for installations within a source that do not have limitations specified in the state implementation plan.

Compliance testing for PM10, sulfur dioxide, and oxides of nitrogen emission limitations shall be done in accordance with Section IX, Part H of the state implementation plan. PM10 compliance shall be determined from the results of EPA test method 201 or 201a. A backhalf analysis shall be performed for inventory purposes for each PM10 compliance test in accordance with Method 202, or other appropriate EPA approved reference method.

Any person owning or operating any motor vehicle or motor vehicle engine registered in the State of Utah on which is installed or incorporated a system or device for the control of crankcase emissions or exhaust emissions in compliance with the Federal motor vehicle rules, shall maintain the system or device in operable condition and shall use it at all times that the motor vehicle or motor vehicle engine is operated. No person shall remove or make inoperable within the State of Utah the system or device or any part thereof, except for the purpose of installing another system or device, or part thereof, which is equally or more effective in reducing emissions from the vehicle to the atmosphere.

The provisions of R307-305 shall apply to the owner or operator of a source that is located in any new PM10 nonattainment area 180 days after the area is officially designated a nonattainment area for PM10 by the Environmental Protection Agency. Provisions of R307-201 shall continue to apply to the owner or operator of a source during this transition period.

KEY: air pollution, particulate matter, PM10, PM 2.5
Date of Enactment or Last Substantive Amendment: December 15, 2015
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)
| Title No. - Rule No. | Utah Admin. Code Ref (R no.): | R307-306 | Filing No. (Office Use Only) |

**Agency Information**

1. **Agency:** Department of Environmental Quality  
   **Room no.:** Fourth Floor  
   **Building:**  
   **Street address:** 195 N 1950 W  
   **City, state, zip:** Salt Lake City, UT 84116-3085  
   **Mailing address:** PO Box 144820  
   **City, state, zip:** Salt Lake City, UT 84116-3085  
   **Contact person(s):**  
   **Name:** Liam Thrailkill  
   **Phone:** 801-536-4419  
   **Email:** lthrailkill@utah.gov

   Please address questions regarding information on this notice to the agency.

**General Information**

2. **Rule catchline:** PM10 Nonattainment and Maintenance Areas: Abrasive Blasting.

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   This rule establishes requirements that apply to abrasive blasting operations in PM10 nonattainment and maintenance areas. Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.”

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   There have been no comments on this rule since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   This rule outlines emission limits that help to ensure that industrial facilities are operating properly and emitting the least possible pollution to protect human health and the environment. This rule is also part of Utah’s State Implementation Plan and cannot be deleted without EPA approval. Therefore, this rule should be continued.

**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

**Agency head or designee, and title:** Bryce Bird  
**Date (mm/dd/yyyy):** 11/20/2019

**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-306-1. Purpose.

This rule establishes requirements that apply to abrasive blasting operations in PM10 nonattainment and maintenance areas.


The following additional definitions apply to R307-306.

"Abrasive Blasting" means the operation of cleaning or preparing a surface by forcibly propelling a stream of abrasive material against the surface.

"Abrasive Blasting Equipment" means any equipment used in abrasive blasting operations.

"Abrasives" means any material used in abrasive blasting operations including but not limited to sand, slag, steel shot, garnet or walnut shells.

"Confined Blasting" means any abrasive blasting conducted in an enclosure that significantly restricts air pollutants from being emitted to the ambient atmosphere, including but not limited to shrouds, tanks, drydocks, buildings and structures.

"Hydroblasting" means any abrasive blasting using high pressure liquid as the propelling force.

"Multiple Nozzles" means a group of two or more nozzles used for abrasive cleaning of the same surface in such close proximity that their separate plumes are indistinguishable.

"Unconfined Blasting" means any abrasive blasting that is not confined blasting as defined above.

"Wet Abrasive Blasting" means any abrasive blasting using compressed air as the propelling force and sufficient water to minimize the plume.


R307-306 applies to any person who operates abrasive blasting equipment in a PM10 nonattainment or maintenance area, or to sources listed in Section IX, Part H of the state implementation plan.


(1) Except as provided in (2) below, visible emissions from abrasive blasting operations shall not exceed 20% opacity except for an aggregate period of three minutes in any one hour.

(2) If the abrasive blasting operation complies with the performance standards in R307-306-6, visible emissions from the operation shall not exceed 40% opacity, except for an aggregate period of 3 minutes in any one hour.


(1) Visible emissions shall be measured using EPA Method 9. Visible emissions from intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15 second intervals over a six minute period shall not apply.

(2) Visible emissions from unconfined blasting shall be measured at the densest point of the emission after a major portion of the spent abrasive has fallen out at a point not less than five feet nor more than twenty-five feet from the impact surface from any single abrasive blasting nozzle.

(3) An unconfined blasting operation that uses multiple nozzles shall be considered a single source unless it can be demonstrated by the owner or operator that each nozzle, measured separately, meets the visible emission standards in R307-306-4.

(4) Emissions from confined blasting shall be measured at the densest point after the air pollutant leaves the enclosure.


(1) To satisfy the requirements of R307-306-4(2), the abrasive blasting operation shall use at least one of the following performance standards:

(a) confined blasting;
(b) wet abrasive blasting;
(c) hydroblasting; or
(d) unconfined blasting using abrasives as defined in (2) below.

(2) Abrasives.

(a) Abrasives used for dry unconfined blasting referenced in (1) above shall comply with the following performance standards:

(i) Before blasting, the abrasive shall not contain more than 1% by weight material passing a #70 U.S. Standard sieve.

(ii) After blasting the abrasive shall not contain more than 1.8% by weight material 5 microns or smaller.

(b) Abrasives reused for dry unconfined blasting are exempt from (a)(ii) above, but must conform with (a)(i) above.

(3) Abrasive Certification. Sources using the performance standard of (1)(d) above to meet the requirements of R307-306-4(2) must demonstrate they have obtained abrasives from a supplier who has certified (submitted test results) to the director at least annually that such abrasives meet the requirements of (2) above.

The provisions of R307-306 shall apply in any new PM10 nonattainment area 180 days after the area is officially designated a nonattainment area for PM10 by the Environmental Protection Agency. Provisions of R307-206 shall continue to apply to the owner or operator of a source during this transition period.

KEY: air pollution, abrasive blasting, PM10
Date of Enactment or Last Substantive Amendment: December 15, 2015
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-101(1)(a)
State of Utah
Administrative Rule Analysis
Revised October 2019

FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

Title No. - Rule No.  
Utah Admin. Code Ref (R no.): R307-307  
Filing No. (Office Use Only)

Agency Information
1. Agency: Department of Environmental Quality  
Room no.: Fourth Floor  
Building:  
Street address: 195 N 1950 W  
City, state, zip: Salt Lake City, UT 84116-3085  
Mailing address: PO Box 144820  
City, state, zip: Salt Lake City, UT 84116-3085  
Contact person(s):  
Name: Liam Thrailkill  
Phone: 801-536-4419  
Email: lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

General Information
2. Rule catchline: Road Salting and Sanding.
3. A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule: Rule R307-307 sets limits on the sodium chloride, magnesium chloride, calcium chloride, and potassium chloride that may be included in salt used on roads. The limits are needed to reduce the particulate matter that is harmful to human health, and are one of the measures included in Utah’s State Implementation Plan (SIP) for PM10 and PM2.5. Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.”
4. A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule: There have been no comments since the last five-year review.
5. A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any: The limits in this rule are needed to reduce particulate matter, and are one of the measures included in Utah’s State Implementation Plan for PM10 and PM2.5 and cannot be deleted without EPA’s approval. Therefore, the rule should be continued.

Agency Authorization Information
To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.
Agency head or designee, and title: Bryce Bird  
Date (mm/dd/yyyy): 11/20/2019
Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-307 applies to all persons who apply salt or abrasives such as crushed slag and sand to roads in PM10 and PM2.5 nonattainment and maintenance areas as defined in 40 CFR 81.345 (July 1, 2011) and geographically described as all regions of Davis, Salt Lake, and Utah counties; all portions of the Cache Valley; all regions in Weber County west of the Wasatch mountain range; in Box Elder County, from the Wasatch mountain range west to the Promontory mountain range and south of Portage; and in Tooele County, from the northernmost part of the Oquirrh mountain range to the northern most part of the Stansbury mountain range and north of Route 199.

The following additional definition applies to R307-307:
"Arterial roadway" has the same meaning as outlined in U.S. DOT Federal Highway Administration Publication No. FHWA-ED-90-006, Revised March 1989, "Highway Functional Classification: Concepts, Criteria, and Procedures" as interpreted by Utah Department of Transportation and shown in the following maps: Salt Lake Urbanized Area, Provo-Orem Urbanized Area, and Ogden Urbanized Area (1992 or later).

(1) Any person who applies salt or abrasives such as crushed slag and sand to roads in PM10 and PM2.5 nonattainment and maintenance areas shall maintain records of the material applied.
   (a) For salt, the records shall include the quantity applied, the percent by weight of insoluble solids in the salt, and the percentage of the material that is sodium chloride (NaCl), magnesium chloride (MgCl2), calcium chloride (CaCl2), or potassium chloride (KCl).
   (b) For abrasives such as sand or crushed slag, the records shall include the quantity applied and the percent by weight of fine material which passes the number 200 sieve in a standard gradation analysis.
(2) All records shall be maintained for a period of at least two years, and the records shall be made available to the director or his designated representative upon request.

(1) After October 1, 1993, any salt applied to roads in Salt Lake, Davis, or Utah counties shall be at least 92% NaCl, MgCl2, CaCl2, and/or KCl.
(2) After January 1, 2014, any salt applied to roads in all other areas specified in R307-307-1 shall be no less than 92% by weight NaCl, MgCl2, CaCl2, and/or KCl.

(1) After October 1, 1993, any person who applies an abrasive such as crushed slag, or sand or who applies salt that is less than 92% by weight NaCl, MgCl2, CaCl2 and/or KCl to roads in Salt Lake, Davis, or Utah Counties shall either:
   (a) demonstrate to the director that the material applied has no more PM10 or PM2.5 emissions than salt which is at least 92% NaCl, MgCl2, CaCl2, and/or KCl; or
   (b) vacuum sweep every arterial roadway (principal and minor) to which the material was applied within three days of the end of the storm for which the application was made.
(2) After January 1, 2014, any person who applies an abrasive such as crushed slag or sand, or who applies salt that is less than 92% by weight NaCl, MgCl2, and/or CaCl2 to roads in all other areas specified in R307-307-1 shall comply with the requirements of either R307-307-5(1)(a) or (b).

(1) In the interest of public safety, any person who applies an abrasive such as crushed slag or sand to arterial roadways because salt alone would not ensure safe driving conditions due to steepness of grade or extreme weather is exempt from the requirements in R307-307-4.
(2) The following roads are specifically excluded from the requirements of R307-307-5(1):
   (a) all canyon roads;
   (b) the portion of Interstate 15 near Point of the Mountain;
   (c) I-15, from Exit 385 northward to the Idaho Border;
   (d) I-84 from Exit 17 eastward to Exit 40 at Tremonton;
   (e) SR-39 from Harrison Boulevard eastward into Ogden Canyon;
   (f) I-84 from the junction with US-89 eastward into Weber Canyon;
   (g) I-80 near Black Rock, from the junction with SR-36 to the junction with SR-202;
   (h) SR-199; and
   (i) SR-196.
KEY: air pollution, roads, particulate
Date of Enactment or Last Substantive Amendment: February 1, 2013
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104
State of Utah  
Administrative Rule Analysis  
Revised October 2019

### FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

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<td>Contact person(s):</td>
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<td>Name:</td>
<td>Liam Thrailkill</td>
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<td>Phone:</td>
<td>801-536-4419</td>
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<td>Email:</td>
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</tr>
</tbody>
</table>

Please address questions regarding information on this notice to the agency.

**General Information**

2. **Rule catchline:**

Nonattainment and Maintenance Areas for PM10 and PM2.5: Fugitive Emissions and Fugitive Dust.

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

Rule R307-309 regulates the amount of dust and fugitive emissions that are allowed to leave the site of any source of air pollution. These regulations are part of Utah’s State Implementation Plan (SIP) to control particulate matter in geographic areas where levels of pollution have exceeded federal health standards in the past; the plan is incorporated by reference under Section R307-110-10. The plan is required under the Clean Air Act, 42 U.S.C. 7410. Subsection 19-2-104(1) authorizes the Air Quality Board to make rules “(a) regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contamination that may be emitted by any air contaminant source”; and “(b) establishing air quality standards.” Subsection 19-2-104(3)(q) authorizes the Board to make rules to “meet the requirements of federal air pollution laws.”

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

R307-309 was amended one time since the last five-year review (DAR #41628). The amendment was to clarify language and make the rule approvable by the EPA. During the public comment period comments were submitted by the EPA and other interested stakeholders. No comments were received since the last five-year review from persons supporting or opposing this rule.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

R307-309 protects the public health by reducing emissions from industries, gravel pits, construction sites, haul trucks, mines, and tailings ponds. In addition, R307-309 is required under the State Implementation Plan (SIP) incorporated by reference under Section R307-110-10. Because the rule is part of the SIP, it cannot be deleted without EPA approval. Therefore, the rule should be continued.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

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<th>Bryce Bird</th>
<th>Date (mm/dd/yyyy):</th>
<th>11/20/2019</th>
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**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.

R307-309. Nonattainment and Maintenance Areas for PM10 and PM2.5: Fugitive Emissions and Fugitive Dust.

R307-309-1. Purpose.

This rule establishes minimum work practices and emission standards for sources of fugitive emissions and fugitive dust.


The following additional definition applies to R307-309:

"Material" means sand, gravel, soil, minerals, and other matter that may create fugitive dust.


(1) R307-309 applies to all new or existing sources of fugitive dust one-quarter acre or greater and any sources of fugitive emissions located in PM10 or PM2.5 nonattainment or maintenance plan areas as defined in 40 CFR 81.345 (July 1, 2011). Collectively, the PM10 and PM2.5 nonattainment and maintenance plan areas are geographically defined as all regions of Salt Lake and Davis counties; all portions of the Cache Valley; all regions in Weber County west of the Wasatch mountain range; all regions of Utah County; in Box Elder County, from the Wasatch mountain range west to the Promontory mountain range and south of Portage; and in Tooele County, from the northernmost part of the Oquirrh mountain range to the northern most part of the Stansbury mountain range and north of Route 199.

(2) Exemptions.

(a) Agriculturally derived fugitive dust sources, including agricultural or horticultural activities specified in 19-2-114 (1)-(3) are exempt from the provisions of R307-309.

(b) Any activity subject to R307-307, Road Salting and Sanding, is exempt from R307-309.


(1) Fugitive emissions from any source shall not exceed 15% opacity.

(2) Opacity observations of fugitive emissions from stationary sources shall be conducted in accordance with EPA Method 9.

(3) For intermittent sources and mobile sources, opacity observations shall be conducted using Method 9; however, the requirement for observations to be made at 15 second intervals over a six-minute period shall not apply. The number of observations and the time period shall be determined by the length of the intermittent or mobile source operation.

R307-309-5. General Requirements for Fugitive Dust.

(1) Except as provided in R307-309-5(3), opacity caused by fugitive dust shall not exceed:

(a) 10% at the property boundary; and

(b) 20% on site

(2) Any person owning or operating a new or existing source of fugitive dust one-quarter acre or greater in size shall submit a fugitive dust control plan to the director in accordance with R307-309-6.

(3) Opacity in R307-309-5(1) shall not apply when the wind speed exceeds 25 miles per hour if the owner or operator has implemented, and continues to implement, the accepted fugitive dust control plan in R307-309-6 and administers one or more of the following contingency measures:

(a) Pre-event watering;

(b) Hourly watering;

(c) Additional chemical stabilization;

(d) Cease or reduce fugitive dust producing operations to the extent practicable.

(4) Wind speed shall be measured by an anemometer.

(5) Opacity observations of fugitive dust from any source shall be measured at the densest point of the plume.

(a) For mobile sources, visible emissions shall be measured at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle.

(b) Opacity observations of emissions from stationary sources shall be measured in accordance with EPA Method 9.

(c) For intermittent sources, opacity observations shall be conducted using Method 9; however, the requirement for observations to be made at 15 second intervals over a six-minute period shall not apply. The number of observations and the time period shall be determined by the length of the intermittent or mobile source operation.


(1) Any person owning or operating a new or existing source of fugitive dust, including storage, hauling or handling operations, clearing or leveling of land one-quarter acre or greater in size, earthmoving, excavation, moving trucks or construction equipment over cleared land one-quarter acre or greater in size or access haul roads, or demolition activities including razing homes, buildings or other structures, shall submit a fugitive dust control plan on a form provided by the director or another format approved by the director.

(a) A fugitive dust control plan that has been submitted to and accepted by the director prior to December 3, 2012, will fulfill the requirements of R307-309-6 for that source.
(2) Activities regulated by R307-309 shall not commence before the fugitive dust control plan is approved by the director.
(a) Successful completion of the web-based division-sponsored fugitive dust control plan tool shall constitute plan approval.
(b) Hard copy fugitive control plan submission must be reviewed and approved by the director prior to commencing activities regulated by R307-309.
(3) Sources with an existing fugitive dust control plan who make site modifications that result in emission changes shall submit an updated fugitive dust control plan.
(4) Minimum fugitive dust control plan requirements. At a minimum, a fugitive dust control plan must include the following requirements as they apply to a source:
(a) Backfilling.
(i) Stabilize backfill material when not actively handling.
(ii) Stabilize backfill material during handling.
(iii) Stabilize soil at completion of backfilling activity.
(iv) Stabilize material while using pipe padder equipment.
(b) Blast.
(i) Stabilize surface soils where drills, support equipment and vehicles will operate.
(ii) Stabilize soil during blast preparation activities.
(iii) Stabilize soil after blasting.
(c) Clearing.
(i) Stabilize surface soils where support equipment and vehicles will operate.
(ii) Stabilize disturbed soil immediately after clearing and grubbing activities.
(iii) Stabilize slopes at completion of activity.
(d) Clearing forms, foundations and slabs.
(i) Use water, sweeping and vacuum to clear.
(e) Crushing.
(i) Stabilize surface soils where support equipment and vehicles will operate.
(ii) Stabilize material before, during and after crushing.
(iii) Traffic mileage or speed controls.
(iv) Minimize transfer height.
(f) Cut and fill.
(i) Stabilize surface soils where support equipment and vehicles will operate.
(ii) Pre-water soils.
(iii) Stabilize soil during and after cut activities.
(g) Demolition-implosion.
(i) Stabilize surface area where support equipment and vehicles will be operated.
(ii) Stabilize demolition debris immediately following blast and safety clearance.
(iii) Stabilize and clean surrounding area immediately following blast and safety clearance.
(h) Demolition-mechanical and manual.
(i) Stabilize surface areas where support equipment and vehicles will operate.
(ii) Stabilize demolition debris during handling.
(iii) Stabilize debris following demolition.
(iv) Stabilize surrounding area following demolition.
(i) Disturbed soil.
(ii) Disturbance of soils where possible.
(iii) Stabilize and maintain stability of all disturbed soil throughout construction site.
(j) Hauling materials.
(i) Limit visible dust opacity from vehicular operations.
(ii) Stabilize materials during transport on site.
(iii) Clean wheels and undercarriage of haul trucks prior to leaving construction site.
(k) Paving subgrade preparation.
(i) Stabilize adjacent disturbed soils following paving activities by applying water, chemical stabilizer and/or synthetic cover.
(l) Sawing and cutting materials.
(i) Limit visible emissions using water or vacuum.
(m) Screening.
(i) Stabilize surface soils where support equipment and vehicles will operate.
(ii) Pre-treat material prior to screening.
(iii) Stabilize material during screening.
(iv) Stabilize material and surrounding area immediately after screening.
(v) Minimize transfer height.
(n) Staging areas.
(i) Limit visible dust opacity from vehicular operations.
(ii) Stabilize staging area soils during use.
(iii) Stabilize staging area soils at project completion.
(o) Stockpiling.
(i) Stabilize stockpile materials during and after handling.
(ii) Stabilize surface soils where support equipment and vehicles will operate.
(p) Trackout prevention and cleanup.
(i) Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or
travel routes intersect.
(q) Traffic on unpaved routes and parking areas.
(i) Stabilize surface soils where support equipment and vehicles will operate.
(r) Trenching.
(i) Stabilize surface soils where trenching equipment, support equipment and vehicles will operate.
(ii) Stabilize soils after trenching.
(s) Truck loading.
(i) Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.
(ii) Stabilize surface soils where support equipment and vehicles will operate.
(5) The fugitive dust control plan must include contact information, site address, total area of disturbance, expected start and
completion dates, identification of dust suppressant and plan certification by signature of a responsible person.

Any person owning, operating or maintaining a new or existing material storage, handling or hauling operation shall prevent, to
the maximum extent possible, and in accordance with R307-309-6, material from being deposited onto any paved road other than a
designated deposit site. Any such person who deposits materials that may create fugitive dust on a public or private paved road shall clean
the road promptly.

Any person engaging in clearing or leveling of land with an area of one-quarter acre or more, earthmoving, excavating,
construction, demolition, or moving trucks or construction equipment over cleared land or access haul roads shall prevent, to the
maximum extent possible, and in accordance with R307-309-6, material from being deposited onto any paved road other than a designated
deposit site. Any such person who deposits materials that may create fugitive dust on a public or private paved road shall clean the road promptly.

(1) Any person responsible for construction or maintenance of any existing road or having right-of-way easement or possessing
the right to use the same whose activities result in fugitive dust from the road shall minimize fugitive dust to the maximum extent possible
and in accordance with R307-309-6. Any such person who deposits materials that may create fugitive dust on a public or private paved
road shall clean the road promptly.
(2) Unpaved Roads. Any person responsible for construction or maintenance of any new or existing unpaved road shall prevent,
to the maximum extent possible, the deposit of material from the unpaved road onto any intersecting paved road during construction or
maintenance. Any person who deposits materials that may create fugitive dust on a public or private paved road shall clean the road promptly.

(1) In addition to the requirements under R307-309-1 through R307-309-6, fugitive dust, construction activities, and roadways
associated with mining activities are regulated under the provisions of R307-309-10.
(2) Any person who owns or operates a mining operation shall minimize fugitive dust as an integral part of site preparation,
mining activities, and reclamation operations.
(3) The fugitive dust control measures to be used shall include:
(a) Periodic watering of unpaved roads or;
(b) Use of chemical stabilizers on unpaved roads or;
(c) Paving of roads.
(d) Immediate removal of coal, rock minerals, soil, and other dust-forming debris from roads and frequent scraping and
compaction of unpaved roads to stabilize the road surface.
(e) Restricting the speed of vehicles in and around the mining operation,
(f) Revegetating, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are a source of fugitive dust.
(g) Restricting the travel of vehicles on other than established roads.
(h) Enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, to minimize loss of material to wind
and spillage.
(i) Substitution of conveyor systems for haul trucks and covering of conveyor systems when conveyed loads are subject to wind erosion.

(j) Minimizing the area of disturbed land.

(k) Prompt revegetation of regraded lands.

(l) Planting of special windbreak vegetation at critical points in the permit area.

(m) Control of dust from drilling, using water sprays, hoods, dust collectors or other controls approved by the director.

(n) Restricting the areas to be blasted at any one time.

(o) Reducing the period of time between initially disturbing the soil and revegetating or other surface stabilization.

(p) Restricting fugitive dust at spoil and coal transfer and loading points.

(q) Control of dust from storage piles through use of enclosures, covers, or stabilization and other equivalent methods or other techniques as determined necessary by the director and upon concurrence by EPA.


(1) In addition to the requirements under R307-309-1 through R307-309-6, fugitive dust, construction activities, and roadways associated with tailings piles and ponds are regulated under the provisions of R307-309-11.

(2) Any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities. Such controls shall include:

(a) Watering or;

(b) Chemical stabilization or;

(c) Synthetic covers or;

(d) Vegetative covers or;

(e) Wind breaks or;

(f) A combination of R307-309-11(2)(a)-(e);

(g) Minimizing the area of disturbed tailings;

(h) Restricting the speed of vehicles in and around the tailings operation; or

(i) Other techniques which may be approvable by the director and upon concurrence by EPA.


All sources subject to R307-309-5(2) and (3) shall maintain records for two years demonstrating compliance with R307-309. These records shall be available to the director upon request.

KEY: air pollution, fugitive dust

Date of Enactment or Last Substantive Amendment: August 4, 2017

Notice of Continuation: February 5, 2015

Authorizing, and Implemented or Interpreted Law: 19-2-101; 19-2-104; 19-2-109
FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

Title No. - Rule No.: Utah Admin. Code Ref (R no.): R307-310 Filing No. (Office Use Only)

Agency Information

1. Agency: Department of Environmental Quality
   Room no.: Fourth Floor
   Building:
   Street address: 195 N 1950 W
   City, state, zip: Salt Lake City, UT 84116-3085
   Mailing address: PO Box 144820
   City, state, zip: Salt Lake City, UT 84116-3085
   Contact person(s):
   Name: Liam Thrailkill
   Phone: 801-536-4419
   Email: lthrailkill@utah.gov

   Please address questions regarding information on this notice to the agency.

General Information

2. Rule catchline:
   Salt Lake County: Trading of Emission Budgets for Transportation Conformity

3. A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:
   Subsection 19-2-104(1)(a) allows the Air Quality Board to make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air contaminants that may be emitted by any air contaminant source.” In addition, Subsection 19-2-104(3)(e) allows the Board to “…prepare and develop a comprehensive plan or plans for the prevention, abatement, and control of air pollution in this state.” Rule R307-310 protects the public health by setting forth a mechanism to trade PM10 for NOx to demonstrate conformity with Salt Lake County PM10 SIP.

4. A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:
   There have been no comments on this rule since the last five-year review.

5. A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:
   Rule R307-310 establishes a conformity budget for Salt Lake County. This budget allows continued funding of transportation projects in Salt Lake County. R307-310 is a component of Utah’s State Implementation Plan (SIP) and cannot be deleted without EPA’s approval. Therefore, the rule should be continued.

Agency Authorization Information

To the agency: Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

Agency head or designee, and title: Bryce Bird
Date (mm/dd/yyyy): 11/20/2019

Reminder: Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
This rule establishes the procedures that may be used to trade a portion of the primary PM10 budget when demonstrating that a transportation plan, transportation improvement program, or project conforms with the motor vehicle emission budgets in the Salt Lake County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."

"Budget" means the motor vehicle emission projections used in the attainment demonstration in the Salt Lake County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."

"NOx" means oxides of nitrogen.

"Primary PM10" means PM10 that is emitted directly by a source. Primary PM10 does not include particulate matter that is formed when gaseous emissions undergo chemical reactions in the ambient air.

"Transportation Conformity" means a demonstration that a transportation plan, transportation improvement program, or project conforms with the emissions budgets in a state implementation plan, as outlined in 40 CFR, Chapter 1, Part 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans."

This rule applies to agencies responsible for demonstrating transportation conformity with the Salt Lake County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."

This rule does not apply to emission budgets from Section IX, Part D.2 of the State Implementation Plan, "Ozone Maintenance Plan."

This rule does not apply to emission budgets from Section IX, Part C.7 of the State Implementation Plan, "Carbon Monoxide Maintenance Provisions."

The agencies responsible for demonstrating transportation conformity are authorized to supplement the budget for NOx with a portion of the budget for primary PM10 for the purpose of demonstrating transportation conformity for NOx. The NOx budget shall be supplemented using the following procedures.

(a) The metropolitan planning organization shall include the following information in the transportation conformity demonstration:
   (i) The budget for primary PM10 and NOx for each required year of the conformity demonstration, before trading allowed by this rule has been applied;
   (ii) The portion of the primary PM10 budget that will be used to supplement the NOx budget, specified in tons per day using a 1:1 ratio of primary PM10 to NOx, for each required year of the conformity demonstration;
   (iii) The remainder of the primary PM10 budget that will be used in the conformity demonstration for primary PM10, specified in tons per day for each required year of the conformity demonstration; and
   (iv) The budget for primary PM10 and NOx for each required year of the conformity demonstration after the trading allowed by this rule has been applied.

(b) Transportation conformity for NOx shall be demonstrated using the NOx budget supplemented by a portion of the primary PM10 budget as described in (a)(ii). Transportation conformity for primary PM10 shall be demonstrated using the remainder of the primary PM10 budget described in (a)(iii).

(c) The primary PM10 budget shall not be supplemented by using a portion of the NOx budget.


R307-310, sections 1-4 will remain in effect until the day that EPA approves the conformity budget in the PM10 maintenance plan adopted by the board on July 6, 2005.

KEY: air pollution, transportation conformity, PM10
Date of Enactment or Last Substantive Amendment: February 8, 2008
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104
**State of Utah**  
**Administrative Rule Analysis**  
**Revised October 2019**

### FIVE-YEAR NOTICE OF REVIEW AND STATEMENT OF CONTINUATION

<table>
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<tr>
<th>Title No. - Rule No.</th>
<th>Utah Admin. Code Ref (R no.): R307-311</th>
<th>Filing No. (Office Use Only)</th>
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### Agency Information

1. **Agency:** Department of Environmental Quality  
2. **Room no.:** Fourth Floor  
3. **Building:**  
4. **Street address:** 195 N 1950 W  
5. **City, state, zip:** Salt Lake City, UT 84116-3085  
6. **Mailing address:** PO Box 144820  
7. **City, state, zip:** Salt Lake City, UT 84116-3085  
8. **Contact person(s):**  
   - **Name:** Liam Thrailkill  
   - **Phone:** 801-536-4419  
   - **Email:** ltrailkill@utah.gov  

Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:** Utah County: Trading of Emission Budgets for Transportation Conformity  
3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**  
   Subsection 19-2-104 states that the Air Quality Board may make rules “…regarding the control, abatement, and prevention of air pollution from all sources and the establishment of the maximum quantity of air pollutants that may be emitted by an air pollutant source.” In addition, Subsection 19-2-104(3)(e) allows the Board to “…prepare and develop a comprehensive plan or plans for the prevention, abatement, and control of air pollution in this state.” Rule R307-311 protects the public health by setting forth a mechanism to trade PM10 for NOx to demonstrate conformity with Utah County PM10 SIP.  
4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**  
   This is the first five-year review for R307-311. No comments were received since the inception of the rule.  
5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**  
   Rule R307-311 establishes a conformity budget for Utah County. This budget allows continued funding of transportation projects in Utah County. R307-311 is a component of Utah’s State Implementation Plan (SIP) and cannot be deleted without EPA’s approval. Therefore, the rule should be continued.

### Agency Authorization Information

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.  
**Agency head or designee, and title:** Bryce Bird  
**Date:** 11/20/2019  
**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.

R307-311-1. Purpose.
This rule establishes the procedures that may be used to trade a portion of the primary PM10 budget when demonstrating that a transportation plan, transportation improvement program, or project conforms with the motor vehicle emission budgets in the Utah County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."

The definitions contained in 40 CFR 93.101, effective as of the date referenced in R307-101-3, are incorporated into this rule by reference. The following additional definitions apply to this rule.
"Budget" means the motor vehicle emission projections used in the attainment demonstration in the Utah County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."
"NOx" means oxides of nitrogen.
"Primary PM10" means PM10 that is emitted directly by a source. Primary PM10 does not include particulate matter that is formed when gaseous emissions undergo chemical reactions in the ambient air.
"Transportation Conformity" means a demonstration that a transportation plan, transportation improvement program, or project conforms with the emissions budgets in a state implementation plan, as outlined in 40 CFR, Chapter 1, Part 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans."

(1) This rule applies to agencies responsible for demonstrating transportation conformity with the Utah County portion of Section IX, Part A of the State Implementation Plan, "Fine Particulate Matter (PM10)."
(2) This rule does not apply to emission budgets from Section IX, Part C.6 of the State Implementation Plan, "Carbon Monoxide Maintenance Plan."

(1) The agencies responsible for demonstrating transportation conformity are authorized to supplement the budget for NOx with a portion of the budget for primary PM10 for the purpose of demonstrating transportation conformity for NOx. The NOx budget shall be supplemented using the following procedures.
(a) The metropolitan planning organization shall include the following information in the transportation conformity demonstration:
   (i) The budget for primary PM10 and NOx for each required year of the conformity demonstration, before trading allowed by this rule has been applied;
   (ii) The portion of the primary PM10 budget that will be used to supplement the NOx budget, specified in tons per day using a 1:1 ratio of primary PM10 to NOx, for each required year of the conformity demonstration;
   (iii) The remainder of the primary PM10 budget that will be used in the conformity demonstration for primary PM10, specified in tons per day for each required year of the conformity demonstration; and
   (iv) The budget for primary PM10 and NOx for each required year of the conformity demonstration after the trading allowed by this rule has been applied.
(b) Transportation conformity for NOx shall be demonstrated using the NOx budget supplemented by a portion of the primary PM10 budget as described in (a)(ii). Transportation conformity for primary PM10 shall be demonstrated using the remainder of the primary PM10 budget described in (a)(iii).
(c) The primary PM10 budget shall not be supplemented by using a portion of the NOx budget.

KEY: air pollution, transportation conformity, PM10
Date of Enactment or Last Substantive Amendment: March 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104
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**Agency Information**

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4. **Mailing address:**
   - **City, state, zip:** Salt Lake City, UT 84116-3085
5. **Contact person(s):**
   - **Name:** Liam Thrailkill
   - **Phone:** 801-536-4419
   - **Email:** lthrailkill@utah.gov

Please address questions regarding information on this notice to the agency.

**General Information**

2. **Rule catchline:** Residential Property and Child Occupied Facility Renovation
3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   R307-841 is one of three Air Quality rules that implements Subsection 19-2-104(1)(i) which authorizes the Air Quality Board to make rules to implement the lead-based paint requirements for training, certification, and performance of 15 U.S.C.A 2601 et seq., Toxic Substances Control Act, Subchapter IV—Lead Exposure Reduction, Sections 402 and 406.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   R307-841 has undergone two amendment processes. The first was May 2016 (OAR#40207) and the second being in May of 2017 (OAR#41100). No comments have been received since the last five-year review of R307-841 from persons supporting or opposing this rule.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   R307-841 contains necessary requirements for Utah to have lead-based paint program regulatory oversight in Utah for renovation projects conducted in target housing and child-occupied facilities. Without R307-841, Utah would not have authority to implement the federal requirements and implementation would be carried out by the Environmental Protection Agency. Therefore, the rule should be continued.
## Agency Authorization Information

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

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<th>Bryce Bird</th>
<th>Date (mm/dd/yyyy):</th>
<th>11/20/2019</th>
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**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-841-1. Purpose.
This rule implements 40 CFR 745, regulations developed under Sections 402 and 406 of the Toxic Substances Control Act (15 U.S.C. 2682 and 2686) and applies to all renovations performed for compensation in target housing and child-occupied facilities. The purpose of this rule is to ensure the following:

(1) Owners and occupants of target housing and child-occupied facilities receive information on lead-based paint hazards before these renovations begin; and

(2) Individuals performing renovations regulated in accordance with R307-841-3 are properly trained; renovators and firms performing these renovations are certified; and the work practices in R307-841-5 are followed during these renovations.

R307-841-2. Effective Dates.

(1) Training, certification and accreditation requirements, and work practice standards. The training, certification and accreditation requirements and work practice standards in this rule are applicable as follows:

(a) Training programs. Effective April 8, 2010, no training program may provide, offer, or claim to provide training or refresher training for director certification as a renovator or a dust sampling technician without accreditation from the director under R307-842-1.

(b) Firms. On or after April 8, 2010, no firm may perform, offer, or claim to perform renovations without certification from the director under R307-841-7 in target housing or child-occupied facilities, unless the renovation qualifies as one of the exceptions identified in R307-841-3(1).

(c) Individuals. On or after April 8, 2010, all renovations must be directed by renovators certified in accordance with R307-841-8(1) and performed by certified renovators or individuals trained in accordance with R307-841-8(2)(b) in target housing or child-occupied facilities, unless the renovation qualifies for one of the exceptions identified in R307-841-3(1).

(d) Work practices. On or after April 8, 2010 and before July 5, 2012, all renovations must be performed in accordance with the work practice standards in R307-841-5 and the associated recordkeeping requirements in R307-841-6(2)(a) and (2)(f) in target housing or child-occupied facilities, unless the renovation qualifies for the exceptions identified in R307-841-3(1). This does not apply to renovations in target housing for which the firm performing the renovation has obtained a statement signed by the owner that the renovation will occur in the owner's residence, no child under age six resides there, the housing is not a child-occupied facility, and the owner acknowledges that the work practices to be used during the renovation will not necessarily include all of the lead-safe work practices contained in EPA's renovation, repair, and painting rule. For the purposes of this section, a child resides in the primary residence of his or her custodial parents, legal guardians, and foster parents. A child also resides in the primary residence of an informal caretaker if the child lives and sleeps most of the time at the caretaker's residence.

(ii) On or after July 5, 2012, all renovations must be performed in accordance with the work practice standards in R307-841-5 and the associated recordkeeping requirements in R307-841-6(2)(a) and (2)(f) in target housing or child-occupied facilities, unless the renovation qualifies for the exception identified in R307-841-3(1).

(2) Renovation-specific pamphlet. Renovators or firms performing renovations must provide owners and occupants with "Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools."


(1) This rule applies to all renovations performed for compensation in target housing and child-occupied facilities, except for the following:

(a) Renovations in target housing or child-occupied facilities in which a written determination has been made by an inspector or risk assessor, certified pursuant to R307-842-2, that the components affected by the renovation are free of paint or other surface coatings that contain lead equal to or in excess of 1.0 milligrams/per square centimeter (mg/cm²) or 0.5% by weight, where the firm performing the renovation has obtained a copy of the determination; or

(b) Renovations in target housing or child-occupied facilities in which a certified renovator, using an EPA-recognized test kit as defined in R307-840-2 and following the kit manufacturer's instructions, has tested each component affected by the renovation and determined that the components are free of paint or other surface coatings that contain lead equal to or in excess of 1.0 mg/cm² or 0.5% by weight. If the components make up an integrated whole, such as the individual stair treads and risers of a single staircase, the renovator is required to test only one of the individual components, unless the individual components appear to have been repainted or refinished separately.

(c) Renovations in target housing or child-occupied facilities in which a certified renovator has collected a paint chip sample from each painted component affected by the renovation and a laboratory recognized by EPA pursuant to section 405(b) of TSCA as being capable of performing analyses for lead compounds in paint chip samples has determined that the samples are free of paint or other surface coatings that contain lead equal to or in excess of 1.0 mg/cm² or 0.5% by weight. If the components make up an integrated whole, such as
the individual stair treads and risers of a single staircase, the renovator is required to test only one of the individual components, unless the individual components appear to have been repainted or refinished separately.

(2) The information distribution requirements in R307-841-4 do not apply to emergency renovations, which are renovation activities that were not planned but result from a sudden, unexpected event (such as non-routine failures of equipment) that, if not immediately attended to, presents a safety or public health hazard, or threatens equipment and/or property with significant damage. Interim controls performed in response to an elevated blood lead level in a resident child are also emergency renovations. Emergency renovations other than interim controls are also exempt from the warning sign, containment, waste handling, training, and certification requirements in R307-841-5, R307-841-7, and R307-841-8 to the extent necessary to respond to the emergency. Emergency renovations are not exempt from the cleaning requirements of R307-841-5(1)(e) which must be performed by certified renovators or individuals trained in accordance with R307-841-8(2)(b), the cleaning verification requirements of R307-841-5(2), which must be performed by certified renovators, and the recordkeeping requirements of R307-841-6(2)(e) and (f).


(1) Renovations in dwelling units. No more than 60 days before beginning renovation activities in any residential dwelling unit of target housing, the firm performing the renovation must:

(a) Provide the owner of the unit with the pamphlet, and comply with one of the following:
   (i) Obtain, from the owner, a written acknowledgment that the owner has received the pamphlet; or
   (ii) Obtain a certificate of mailing at least 7 days prior to the renovation; and

(b) If the owner does not occupy the dwelling unit, provide an adult occupant of the unit with the pamphlet, and comply with one of the following:
   (i) Obtain, from the adult occupant, a written acknowledgment that the occupant has received the pamphlet, or certify in writing that a pamphlet has been delivered to the dwelling and that the firm performing the renovation has been unsuccessful in obtaining a written acknowledgment from an adult occupant. Such certification must include the address of the unit undergoing renovation, the date and method of delivery of the pamphlet, names of the persons delivering the pamphlet, reason for lack of acknowledgment (e.g., occupant refuses to sign, no adult occupant available), the signature of a representative of the firm performing the renovation, and the date of signature; or
   (ii) Obtain a certificate of mailing at least 7 days prior to the renovation.

(2) Renovations in common areas. No more than 60 days before beginning renovation activities in common areas of multi-unit target housing, the firm performing the renovation must:

(a) Provide the owner with the pamphlet, and comply with one of the following:
   (i) Obtain, from the owner, a written acknowledgment that the owner has received the pamphlet; or
   (ii) Obtain a certificate of mailing at least 7 days prior to the renovation;

(b) Comply with one of the following:
   (i) Notify in writing, or ensure written notification of, each affected unit and make the pamphlet available upon request prior to the start of renovation. Such notification shall be accomplished by distributing written notice to each affected unit. The notice shall describe the general nature and locations of the planned renovation activities, the expected starting and ending dates, and a statement of how the occupant can obtain the pamphlet and a copy of the records required by R307-841-6(3) and (4) at no cost to the occupants; or
   (ii) While the renovation is ongoing, post informational signs describing the general nature and locations of the renovation and the anticipated completion date. These signs must be posted in areas where they are likely to be seen by the occupants of all of the affected units. The signs must be accompanied by a posted copy of the pamphlet or information on how interested occupants can review a copy of the pamphlet or obtain a copy from the renovation firm at no cost to occupants. The signs must also include information on how interested occupants can review a copy of the records required by R307-841-6(3) and (4) or obtain a copy from the renovation firm at no cost to the occupants;

   (c) Prepare, sign, and date a statement describing the steps performed to notify all occupants of the intended renovation activities and to provide the pamphlet; and

   (d) If the scope, locations, or expected starting and ending dates of the planned renovation activities change after the initial notification, and the firm provided written initial notification to each affected unit, the firm performing the renovation must provide further written notification to the owners and occupants providing revised information on the ongoing or planned activities. This subsequent notification must be provided before the firm performing the renovation initiates work beyond that which was described in the original notice.

(3) Renovations in child-occupied facilities. No more than 60 days before beginning renovation activities in any child-occupied facility, the firm performing the renovation must:

(a)(i) Provide the owner of the building with the pamphlet, and comply with one of the following:
   (A) Obtain, from the owner, a written acknowledgment that the owner has received the pamphlet; or
   (B) Obtain a certificate of mailing at least 7 days prior to the renovation;

   (ii) If the adult representative of the child-occupied facility is not the owner of the building, provide an adult representative of the child-occupied facility with the pamphlet, and comply with one of the following:
   (A) Obtain, from the adult representative, a written acknowledgment that the adult representative has received the pamphlet, or
certify in writing that a pamphlet has been delivered to the facility and that the firm performing the renovation has been unsuccessful in obtaining a written acknowledgment from an adult representative. Such certification must include the address of the child-occupied facility undergoing renovation, the date and method of delivery of the pamphlet, names of the persons delivering the pamphlet, reason for lack of acknowledgment (e.g., representative refuses to sign), the signature of a representative of the firm performing the renovation, and the date of signature; or

(B) Obtain a certificate of mailing at least 7 days prior to the renovation;

(b) Provide the parents and guardians of children using the child-occupied facility with the pamphlet and information describing the general nature and locations of the renovation and the anticipated completion date and information on how interested parents or guardians of children frequenting the child-occupied facility can review a copy of the records required by R307-841-6(3) and (4) or obtain a copy from the renovation firm at no cost to the parents or guardians by complying with one of the following:

(i) Mail or hand-deliver the pamphlet and the renovation information to each parent or guardian of a child using the child-occupied facility; or

(ii) While the renovation is ongoing, post informational signs describing the general nature and locations of the renovation and the anticipated completion date. These signs must be posted in areas where they can be seen by the parents or guardians of the children frequenting the child-occupied facility. The signs must be accompanied by a posted copy of the pamphlet or information on how interested parents or guardians of children frequenting the child-occupied facility can review a copy of the pamphlet or obtain a copy from the renovation firm at no cost to the parents or guardians. The signs must also include information on how interested parents or guardians of children frequenting the child-occupied facility can review a copy of the records required by R307-841-6(3) and (4) or obtain a copy from the renovation firm at no cost to the parents or guardians.

(c) The renovation firm must prepare, sign, and date a statement describing the steps performed to notify all parents and guardians of the intended renovation activities and to provide the pamphlet.

(R307-841-5 Work Practice Standards.)

(1) Standards for renovation activities. Renovations must be performed by firms certified under R307-841-7 using renovators certified under R307-841-8. The responsibilities of certified firms are set forth in R307-841-7(4) and the responsibilities of certified renovators are set forth in R307-841-8(2).

(a) Occupant protection. Firms must post signs clearly defining the work area and warning occupants and other persons not involved in renovation activities to remain outside of the work area. To the extent practicable, these signs must be in the primary language of the occupants. These signs must be posted before beginning the renovation, must remain in place, and must be readable until the renovation and the post-renovation cleaning verification have been completed. If warning signs have been posted in accordance with 24 CFR 35.1345(b)(2) or 29 CFR 1926.62(m), additional signs are not required by this section.

(b) Containing the work area. Before beginning the renovation, the firm must isolate the work area so that no dust or debris leaves the work area while the renovation is being performed. In addition, the firm must maintain the integrity of the containment by ensuring that any plastic or other impermeable materials are not torn or displaced, and taking any other steps necessary to ensure that no dust or debris leaves the work area while the renovation is being performed. The firm must also ensure that containment is installed in such a manner that it does not interfere with occupant and worker egress in an emergency.

(i) Interior renovations. The firm must:

(A) Remove all objects from the work area, including furniture, rugs, and window coverings, or cover them with plastic sheeting or other impermeable material with all seams and edges taped or otherwise sealed;

(B) Close and cover all duct openings in the work area with taped-down plastic sheeting or other impermeable material;

(C) Close windows and doors in the work area. Doors must be covered with plastic sheeting or other impermeable material. Doors used as an entrance to the work area must be covered with plastic sheeting or other impermeable material in a manner that allows workers to pass through while confining dust and debris to the work area;

(D) Cover the floor surface, including installed carpet, with taped-down plastic sheeting or other impermeable material in the work area 6 feet beyond the perimeter of surfaces undergoing renovation or a sufficient distance to contain the dust, whichever is greater. Floor containment measures may stop at the edge of the vertical barrier when using a vertical containment system consisting of impermeable barriers that extend from the floor to the ceiling and are tightly sealed at joints with the floor, ceiling, and walls; and

(E) Use precautions to ensure that all personnel, tools, and other items, including the exterior of containers of waste, are free of dust and debris before leaving the work area.

(ii) Exterior renovations. The firm must:

(A) Close all doors and windows within 20 feet of the renovation. On multi-story buildings, close all doors and windows within
20 feet of the renovation on the same floor as the renovation, and close all doors and windows on all floors below that are the same horizontal distance from the renovation;

(B) Ensure that doors within the work area that will be used while the job is being performed are covered with plastic sheeting or other impermeable material in a manner that allows workers to pass through while confining dust and debris to the work area;

(C) Cover the ground with plastic sheeting or other disposable impermeable material extending 10 feet beyond the perimeter of surfaces undergoing renovation or a sufficient distance to collect falling paint debris, whichever is greater, unless the property line prevents 10 feet of such ground covering. Ground containment measures may stop at the edge of the vertical barrier when using a vertical containment system;

(D) If the renovation will affect surfaces within 10 feet of the property line, the renovation firm must erect vertical containment or equivalent extra precautions in containing the work area to ensure that dust and debris from the renovation does not contaminate adjacent buildings or migrate to adjacent properties. Vertical containment or equivalent extra precautions in containing the work area may also be necessary in other situations in order to prevent contamination of other buildings, other areas of the property, or adjacent buildings or properties.

(c) Prohibited and restricted practices. The work practices listed below are prohibited or restricted during a renovation as follows:

(i) Open-flame burning or torching of painted surfaces is prohibited;

(ii) The use of machines designed to remove paint or other surface coatings through high speed operation such as sanding, grinding, power planning, needle gun, abrasive blasting, or sandblasting, is prohibited on painted surfaces unless such machines have shrouds or containment systems and are equipped with a HEPA vacuum attachment to collect dust and debris at the point of generation. Machines must be operated so that no visible dust or release of air occurs outside the shroud or containment system; and

(iii) Operating a heat gun on painted surfaces is permitted only at temperatures below 1,100 degrees Fahrenheit.

(d) Waste from renovations.

(i) Waste from renovation activities must be contained to prevent releases of dust and debris before the waste is removed from the work area for storage or disposal. If a chute is used to remove waste from the work area, it must be covered.

(ii) At the conclusion of each work day and at the conclusion of the renovation, waste that has been collected from renovation activities must be stored under containment, in an enclosure, or behind a barrier that prevents release of dust and debris out of the work area and prevents access to dust and debris.

(iii) When the firm transports waste from renovation activities, the firm must contain the waste to prevent release of dust and debris.

(e) Cleaning the work area. After the renovation has been completed, the firm must clean the work area until no dust, debris, or residue remains.

(i) Interior and exterior renovations. The firm must:

(A) Collect all paint chips and debris and, without dispersing any of it, seal this material in a heavy-duty bag; and

(B) Remove the protective sheeting. Mist the sheeting before folding it, fold the dirty side inward, and either tape shut to seal or seal in heavy-duty bags. Sheetings used to isolate contaminated rooms from non-contaminated rooms must remain in place until after the cleaning and removal of other sheeting. Dispose of the sheeting as waste.

(ii) Additional cleaning for interior renovations. The firm must clean all objects and surfaces in the work area and within 2 feet of the work area in the following manner, cleaning from higher to lower:

(A) Walls. Clean walls starting at the ceiling and working down to the floor by either vacuuming with a HEPA vacuum or wiping with a damp cloth;

(B) Remaining surfaces. Thoroughly vacuum all remaining surfaces and objects in the work area, including furniture and fixtures, with a HEPA vacuum. The HEPA vacuum must be equipped with a beater bar when vacuuming carpets and rugs; and

(C) Wipe all remaining surfaces and objects in the work area, except for carpeted or upholstered surfaces, with a damp cloth. Mop uncarpeted floors thoroughly, using a mopping method that keeps the wash water separate from the rinse water, such as the 2-bucket mopping method, or using a wet mopping system.

(2) Standards for post-renovation cleaning verification.

(a) Interiors.

(i) A certified renovator must perform a visual inspection to determine whether dust, debris, or residue is still present. If dust, debris, or residue is present, these conditions must be removed by re-cleaning and another visual inspection must be performed.

(ii) After a successful visual inspection, a certified renovator must:

(A) Verify that each windowsill in the work area has been adequately cleaned, using the following procedure.

(I) Wipe the windowsill with a wet disposable cleaning cloth that is damp to the touch. If the cloth matches or is lighter than the cleaning verification card, the windowsill has been adequately cleaned.

(II) If the cloth does not match and is darker than the cleaning verification card, re-clean the windowsill as directed in paragraphs (1)(e)(ii)(B) and (1)(e)(ii)(C) of this section, then either use a new cloth or fold the used cloth in such a way that an unused surface is exposed, and wipe the surface again. If the cloth matches or is lighter than the cleaning verification card, that windowsill has been adequately cleaned.

(iii) If the cloth does not match and is darker than the cleaning verification card, wait for 1 hour or until the surface has dried.
(IV) After waiting for the windowsill to dry, wipe the windowsill with a dry disposable cleaning cloth. After this wipe, the windowsill has been adequately cleaned.

(B) Wipe uncarpeted floors and countertops within the work area with a wet disposable cleaning cloth. Floors must be wiped using application device with a long handle and a head to which the cloth is attached. The cloth must remain damp at all times while it is being used to wipe the surface for post-renovation cleaning verification. If the surface within the work area is greater than 40 square feet, the surface within the work area must be divided into roughly equal sections that are each less than 40 square feet. Wipe each such section separately with a new wet disposable cleaning cloth. If the cloth used to wipe each section of the surface within the work area matches the cleaning verification card, the surface has been adequately cleaned.

(I) If the cloth used to wipe a particular surface section does not match the cleaning verification card, re-clean that section of the surface as directed in paragraphs (1)(e)(ii)(B) and (1)(e)(ii)(C) of this section, then use a new wet disposable cleaning cloth towipe that section again. If the cloth matches the cleaning verification card, that section of the surface has been adequately cleaned.

(II) If the cloth used to wipe a particular surface section does not match the cleaning verification card after the surface has been re-cleaned, wait for 1 hour or until the entire surface within the work area has dried completely, whichever is longer.

(III) After waiting for the entire surface within the work area to dry, wipe each section of the surface that has not yet achieved post-renovation cleaning verification with a dry disposable cleaning cloth. After this wipe, that section of the surface has been adequately cleaned.

(iii) When the work area passes the post-renovation cleaning verification, remove the warning signs.

(b) Exteriors. A certified renovator must perform a visual inspection to determine whether dust, debris, or residue is still present on surfaces in and below the work area, including windowsills and the ground. If dust, debris, or residue is present, these conditions must be eliminated and another visual inspection must be performed. When the area passes the visual inspection, remove the warning signs.

(3) Optional dust clearance testing. Cleaning verification need not be performed if the contract between the renovation firm and the person contracting for the renovation or another federal, state, territorial, tribal, or local law or regulation requires:

(a) The renovation firm to perform dust clearance sampling at the conclusion of a renovation covered by this rule.

(b) The dust clearance samples are required to be collected by a certified inspector, risk assessor, or dust sampling technician.

(c) The renovation firm is required to re-clean the work area until the dust clearance sample results are below the clearance standards in R307-842-3(5)(h) or any local standard.

(4) Activities conducted after post-renovation cleaning verification. Activities that do not disturb paint, such as applying paint to walls that have already been prepared, are not regulated by this rule if they are conducted after post-renovation cleaning verification has been performed.

R307-841-6. Recordkeeping and Reporting Requirements.

(1) Firms performing renovations must retain and, if requested, make available to the director all records necessary to demonstrate compliance with this rule for a period of 3 years following completion of the renovation. This 3-year retention requirement does not supersede longer obligations required by other provisions for retaining the same documentation.

(2) Records that must be retained pursuant to paragraph (1) of this section shall include (where applicable):

(a) Records or reports certifying that a determination had been made that lead-based paint is not present on the components affected by the renovation, as described in R307-841-3(1). These records or reports include:

(i) Reports prepared by a certified inspector or certified risk assessor certified pursuant to R307-842-2.

(ii) Records prepared by a certified renovator after using EPA-recognized test kits, including an identification of the manufacturer and model of any test kits used, a description of the components that were tested including their locations, and the result of each test kit used.

(iii) Records prepared by a certified renovator after collecting paint chip samples, including a description of the components that were tested including their locations, the name and address of the NLLAP-recognized entity performing the analysis, and the results for each sample.

(b) Signed and dated acknowledgments of receipt as described in R307-841-4(1)(a)(i), (1)(b)(i), (2)(a)(i), (3)(a)(ii)(A), and (3)(a)(ii)(A).

(c) Certifications of attempted delivery as described in R307-841-4(1)(b)(i) and (3)(a)(ii)(A).

(d) Certificates of mailing as described in R307-841-4(1)(a)(ii), (1)(b)(ii), (2)(a)(ii), (3)(a)(ii)(B), and (3)(a)(ii)(B).

(e) Records of notification activities performed regarding common area renovations, as described in R307-841-4(2)(c) and (2)(d), and renovations in child-occupied facilities, as described in R307-841-4(3)(b).

(f) Documentation of compliance with the requirements of R307-841-5, including documentation that a certified renovator was assigned to the project, that the certified renovator provided on-the-job training for workers used on the project, that the certified renovator performed or directed workers who performed all of the tasks described in R307-841-5(1), and that the certified renovator performed the post-renovation cleaning verification described in R307-841-5(2). If the renovation firm was unable to comply with all of the requirements of this rule due to an emergency as defined in R307-841-3, the firm must document the nature of the emergency and the provisions of the rule that were not followed. This documentation must include a copy of the certified renovator's current Utah Lead-Based Paint Renovator certification card, and a certification by the certified renovator assigned to the project that:
(i) Training was provided to workers (topics must be identified for each worker).
(ii) Warning signs were posted at the entrances to the work area.
(iii) If test kits were used, that the specified brand of kits was used at the specified locations and that the results were as specified.
(iv) If paint chip samples were collected, that the samples were collected at the specified locations, that the specified NLLAP-recognized laboratory analyzed the samples, and that the results were as specified.
(v) The work area was contained by:
(A) Removing or covering all objects in the work area (interiors);
(B) Closing and covering all HVAC ducts in the work area (interiors);
(C) Closing all windows in the work area (interiors) or closing all windows in and within 20 feet of the work area (exteriors);
(D) Closing and sealing all doors in the work area (interiors) or closing and sealing all doors in and within 20 feet of the work area (exteriors);
(E) Covering doors in the work area that were being used to allow passage but prevent spread of dust;
(F) Covering the floor surface, including installed carpet, with taped-down plastic sheeting or other impermeable material in the work area 6 feet beyond the perimeter of surfaces undergoing renovation or a sufficient distance to contain the dust, whichever is greater (interiors) or covering the ground with plastic sheeting or other disposable impermeable material anchored to the building extending 10 feet beyond the perimeter of surfaces undergoing renovation or a sufficient distance to collect falling paint debris, whichever is greater, unless the property line prevents 10 feet of such ground covering, weighted down by heavy objects (exteriors); and
(G) Installing (if necessary) vertical containment to prevent migration of dust and debris to adjacent property (exteriors).
(vi) Waste was contained on-site and while being transported off-site.
(vii) The work area was properly cleaned after the renovation by:
(A) Picking up all chips and debris, misting protective sheeting, folding it dirty side inward, and taping it for removal; and
(B) Cleaning the work area surfaces and objects using a HEPA vacuum and/or wet cloths or mops (interiors).
(viii) The certified renovator performed the post-renovation cleaning verification (the results of which must be briefly described, including the number of wet and dry cloths used).

(3)(a) When the final invoice for the renovation is delivered or within 30 days of the completion of the renovation, whichever is earlier, the renovation firm must provide information pertaining to compliance with this rule to the following persons:
(i) The owner of the building; and, if different,
(ii) An adult occupant of the residential dwelling, if the renovation took place within a residential dwelling, or an adult representative of the child-occupied facility, if the renovation took place within a child-occupied facility.
(b) When performing renovations in common areas of multi-unit target housing, renovation firms must post the information required by this rule or instructions on how interested occupants can obtain a copy of this information. This information must be posted in areas where it is likely to be seen by the occupants of all of the affected units.
(c) The information required to be provided by paragraph (3) of this section may be provided by completing the sample form titled "Sample Renovation Recordkeeping Checklist" or a similar form containing the test kit information required by R307-841-6(2)(a)(ii) and the training and work practice compliance information required by R307-841-6(2)(f).

(4) If dust clearance sampling is performed in lieu of cleaning verification as permitted by R307-841-5(3), the renovation firm must provide, when the final invoice for the renovation is delivered or within 30 days of the completion of the renovation, whichever is earlier, a copy of the dust sampling report to:
(a) The owner of the building; and, if different,
(b) An adult occupant of the residential dwelling, if the renovation took place within a residential dwelling, or an adult representative of the child-occupied facility, if the renovation took place within a child-occupied facility.
(c) When performing renovations in common areas of multi-unit target housing, renovation firms must post these dust sampling reports or information on how interested occupants of the housing being renovated can obtain a copy of the report. This information must be posted in areas where they are likely to be seen by the occupants of all of the affected units.


(1) Initial certification.

(a) Firms that perform renovations for compensation must apply to the director for certification to perform renovations or dust sampling. To apply, a firm must submit to the director a completed "Lead-Based Paint Certification Application for Firms," signed by an authorized agent of the firm, and pay the correct amount of fees.
(b) After the director receives a firm's application, the director will take one of the following actions within 90 days of the date the application is received:
(i) The director will approve a firm's application if the director determines that it is complete and that the environmental compliance history of the firm, its principals, or its key employees does not show an unwillingness or inability to maintain compliance with environmental statutes or regulations. An application is complete if it contains all of the information requested on the form and includes at least the correct amount of fees. When the director approves a firm's application, the director will issue the firm a certificate with an expiration date not more than 5 years from the date the application is approved;
(ii) The director will request a firm to supplement its application if the director determines that the application is incomplete. If
the director requests a firm to supplement its application, the firm must submit the requested information or pay the additional fees within 30 days of the date of the request; and

(iii) The director will not approve a firm's application if the firm does not supplement its application in accordance with paragraph (1)(b)(ii) of this section or if the director determines that the environmental compliance history of the firm, its principals, or its key employees demonstrates an unwillingness or inability to maintain compliance with environmental statutes or regulations. The director will send the firm a letter giving the reason for not approving the application. The director will not refund the application fees. A firm may reapply for certification at any time by filing a new, complete application that includes the correct amount of fees.

(2) Re-certification. To maintain its certification, a firm must be re-certified by the director.

(a) Timely and complete application. To be re-certified, a firm must submit a complete application for re-certification. A complete application for re-certification includes a completed "Lead-Based Paint Certification Application for Firms" which contains all of the information requested by the form and is signed by an authorized agent of the firm, noting on the form that it is submitted as a re-certification. A complete application must also include the correct amount of fees.

(i) An application for re-certification is timely if it is postmarked 90 days or more before the date the firm's current certification expires. If the firm's application is complete and timely, the firm's current certification will remain in effect until its expiration date or until the director has made a final decision to approve or disapprove the re-certification application, whichever is later.

(ii) If the firm submits a complete re-certification application less than 90 days before its current certification expires, and the director does not approve the application before the expiration date, the firm's current certification will expire and the firm will not be able to conduct renovations until the director approves its re-certification application.

(iii) If the firm fails to obtain re-certification before the firm's current certification expires, the firm must not perform renovations or dust sampling until it is certified anew pursuant to paragraph (1), of this section.

(b) Director's action on an application. After the director receives a firm's application for re-certification, the director will review the application and take one of the following actions within 90 days of receipt:

(i) The director will approve a firm's application if the director determines that it is timely and complete and that the environmental compliance history of the firm, its principals, or its key employees does not show an unwillingness or inability to maintain compliance with environmental statutes or regulations. When the director approves a firm's application for re-certification, the director will issue the firm a new certificate with an expiration date not more than 5 years from the date that the firm's current certification expires.

(ii) The director will request a firm to supplement its application if the director determines that the application is incomplete.

(iii) The director will not approve a firm's application if it is not received or is not complete as of the date that the firm's current certification expires, or if the director determines that the environmental compliance history of the firm, its principals, or its key employees demonstrates an unwillingness or inability to maintain compliance with environmental statutes or regulations. The director will send the firm a letter giving the reason for not approving the application. The director will not refund the application fees. A firm may reapply for certification at any time by filing a new application and paying the correct amount of fees.

(3) Amendment of certification. A firm must amend its certification within 90 days of the date a change occurs to information included in the firm's most recent application. If the firm fails to amend its certification within 90 days of the date the change occurs, the firm may not perform renovations or dust sampling until its certification is amended.

(a) To amend a certification, a firm must submit a completed "Lead-Based Paint Certification Application for Firms," signed by an authorized agent of the firm, noting on the form that it is submitted as an amendment and indicating the information that has changed. The firm must also pay at least the correct amount of fees.

(b) If additional information is needed to process the amendment, or the firm did not pay the correct amount of fees, the director will request the firm to submit the necessary information or fees. The firm's certification is not amended until the firm complies with the request.

(c) Amending a certification does not affect the certification expiration date.

(4) Firm responsibilities. Firms performing renovations must ensure that:

(a) All individuals performing renovation activities on behalf of the firm are either certified renovators or have been trained by a certified renovator in accordance with R307-841-8;

(b) A certified renovator is assigned to each renovation performed by the firm and discharges all of the certified renovator responsibilities identified in R307-841-8;

(c) All renovations performed by the firm are performed in accordance with the work practice standards in R307-841-5;

(d) The pre-renovation education requirements of R307-841-4 have been performed; and

(e) The recordkeeping requirements of R307-841-6 are met.


(1) Renovator certification and dust sampling technician certification.

(a) To become a certified renovator or certified dust sampling technician, an individual must successfully complete an initial lead-based paint renovator or dust-sampling technician course accredited by the director under R307-842-1, the EPA under 40 CFR 745.225, or a state or tribal program that has been authorized by EPA pursuant to subpart Q of 40 CFR 745.

(b) Individuals who have successfully completed an accredited abatement worker or supervisor course, or individuals who successfully completed a director, EPA, HUD, or EPA/HUD model renovation training course before October 4, 2011, but no later than
the training course expiration date found on that training certificate, may take an accredited refresher renovator training course that includes hands-on training in lieu of the initial renovator training course to become a certified renovator.

(c) Individuals who have successfully completed an accredited lead-based paint inspector or risk assessor course before October 4, 2011, but no later than the training course expiration date found on that training certificate, may take an accredited refresher dust sampling technician course in lieu of the initial training to become a certified dust sampling technician. Individuals who are currently certified as lead-based paint inspectors or risk assessors may act as certified dust sampling technicians without further training.

(d) To maintain renovator certification or dust sampling technician certification, an individual must complete a renovator or dust sampling technician refresher course accredited by the director under R307-842-1, the EPA under 40 CFR 745.225, or by a state or tribal program that is authorized under subpart Q of 40 CFR 745 within 5 years of the date the individual completed the initial course described in paragraph (1)(a) of this section. If the individual does not complete a refresher course within this time, the individual must re-take the initial course to become certified again. Individuals who complete a renovator course accredited by the director under R307-842-1, the EPA or an EPA authorized program on or before March 31, 2010, must complete a renovator refresher course accredited by the director under R307-842-1, the EPA or an EPA authorized program on or before March 31, 2016, to maintain renovator certification. Individuals who completed a renovator course accredited by the director under R307-842-1, the EPA or an EPA authorized program between April 1, 2010 and March 31, 2011, will have one year added to their original 5-year training certificate expiration date. Individuals who take a renovator refresher course that does not include hands-on training will have a training course certificate expiration date 3 years from the date they complete the training. Individuals who take a refresher training course that includes hands-on training will have a training course certificate expiration date 5 years from the date they complete the training. Individuals who take the renovator refresher course without hands-on training must, for their next renovator refresher course, take a course that includes hands-on training.

(e) An individual shall be re-certified as a renovator or a dust sampling technician if the individual successfully completes the appropriate lead-based paint accredited refresher training course and submits a valid copy of the appropriate refresher course completion certificate. During the time period when the individual is not certified by the director, that individual cannot perform any regulated work activities that requires individual certification.

(2) Renovator responsibilities. Certified renovators are responsible for ensuring compliance with R307-841-5 at all renovations to which they are assigned. A certified renovator:

(a) Must perform all of the tasks described in R307-841-5(2) and must either perform or direct workers who perform all of the tasks described in R307-841-5(1);
(b) Must provide training to workers on the work practices required by R307-841-5(1) that they will be using in performing their assigned tasks;
(c) Must be physically present at the work site when the signs required by R307-841-5(1)(a) are posted, while the work area containment required by R307-841-5(1)(b) is being established, and while the work area cleaning required by R307-841-5(1)(e) is performed;
(d) Must regularly direct work being performed by other individuals to ensure that the work practices required by R307-841-5(1) are being followed, including maintaining the integrity of the containment barriers and ensuring that dust or debris does not spread beyond the work area;
(e) Must be available, either on-site or by telephone, at all times that renovations are being conducted;
(f) When requested by the party contracting for renovation services, must use an acceptable test kit to determine whether components to be affected by the renovation contain lead-based paint;
(g) Must have with them at the work site their current Utah Lead-Based Paint Renovator certification card; and
(h) Must prepare the records required by R307-841-6(2)(a)(ii), (iii), and (f).

(3) Dust sampling technician responsibilities. When performing optional dust clearance sampling under R307-841-5(3), a certified dust sampling technician:

(a) Must collect dust samples in accordance with R307-842-3(5)(h), must send the collected samples to a laboratory recognized by EPA under TSCA Section 405(b), and must compare the results to the clearance levels in accordance with R307-842-3(5)(h); and
(b) Must have with them at the work site their current Utah Lead-Based Paint Dust Sampling Technician certification card.

R307-841.9. Suspending, Revoking, or Modifying an Individual's or Firm's Certification.

(1) Grounds for suspending, revoking, or modifying an individual's certification. The director may suspend, revoke, or modify an individual's certification if the individual fails to comply with state lead-based paint administrative rules. The director may also suspend, revoke, or modify a certified renovator's certification if the renovator fails to ensure that all assigned renovations comply with R307-841-5. In addition to an administrative or judicial finding of violation, execution of a consent agreement in settlement of an enforcement action constitutes, for purposes of this section, evidence of a failure to comply with relevant statutes or regulations.

(2) Grounds for suspending, revoking, or modifying a firm's certification. The director may suspend, revoke, or modify a firm's certification if the firm:

(a) Submits false or misleading information to the director in its application for certification or re-certification,
(b) Fails to maintain or falsifies records required in R307-841-6, or
(c) Fails to comply, or an individual performing a renovation on behalf of the firm fails to comply, with state lead-based paint administrative rules. In addition to an administrative or judicial finding of violation, execution of a consent agreement in settlement of an
enforcement action constitutes, for purposes of this section, evidence of a failure to comply with relevant statutes or regulations.

KEY: paint, lead-based paint, lead-based paint renovation

Date of Enactment or Last Substantive Amendment: May 9, 2017

Notice of Continuation: February 5, 2015

Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(i)
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<th>Utah Admin. Code Ref (R no.)</th>
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### Agency Information

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<tr>
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<tr>
<td>Name:</td>
<td>Liam Thrailkill</td>
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<td>801-536-4419</td>
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<td>Email:</td>
<td><a href="mailto:lthrailkill@utah.gov">lthrailkill@utah.gov</a></td>
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Please address questions regarding information on this notice to the agency.

### General Information

2. **Rule catchline:**

   Lead-Based Paint Activities.

3. **A concise explanation of the particular statutory provisions under which the rule is enacted and how these provisions authorize or require this rule:**

   R307-842 is one of three Air Quality rules that implements Subsection 19-2-104(1)(i) which authorizes the Air Quality Board to make rules to implement the lead-based paint requirements for training, certification, and performance of 15 U.S.C.A 2601 et seq., Toxic Substances Control Act, Subchapter IV—Lead Exposure Reduction, Sections 402 and 406.

4. **A summary of written comments received during and since the last five-year review of this rule from interested persons supporting or opposing this rule:**

   One amendment to R307-842 has been made since the last five-year review (OAR#41001) and was completed in May 2017. There have been no comments received from persons supporting or opposing this rule since the last five-year review.

5. **A reasoned justification for continuation of this rule, including reasons why the agency disagrees with comments in opposition to this rule, if any:**

   R307-842 contains necessary requirements for Utah to have lead-based paint program regulatory oversight in Utah for renovation projects conducted in target housing and child-occupied facilities. Without R307-842, Utah would not have authority to implement the federal requirements and implementation would be carried out by the Environmental Protection Agency. Therefore, the rule should be continued.
**Agency Authorization Information**

**To the agency:** Information requested on this form is required by Section 63G-3-305. Incomplete forms will be returned to the agency for completion, possibly delaying the effective date.

| Agency head or designee, and title: | Bryce Bird | Date (mm/dd/yyyy): | 11/20/2019 |

**Reminder:** Text changes cannot be made with this type of rule filing. To change any text, please file an amendment or nonsubstantive change.
R307-842. Lead-Based Paint Activities.

R307-842-1. Accreditation of Training Programs: Target Housing and Child-Occupied Facilities.

(1) Scope.
(a) A training program may seek accreditation to offer courses in any of the following disciplines: inspector, risk assessor, supervisor, project designer, abatement worker, renovator, and dust sampling technician. A training program may also seek accreditation to offer refresher courses for each of the above listed disciplines. Training courses taught in Utah must be accredited by the director. All e-learning renovator refresher courses originating from companies based in Utah must also be accredited by the director.
(b) Training programs may apply to the director for accreditation of their lead-based paint activities courses or refresher courses pursuant to this section. Training programs may apply to the director for accreditation of their renovator or dust sampling technician courses or refresher courses pursuant to this section.
(c) A training program must not provide, offer, or claim to provide director-accredited lead-based paint activities courses without applying for and receiving accreditation from the director as required under paragraph (2) of this section. A training program must not provide, offer, or claim to provide director-accredited renovator or dust sampling technician courses without applying for and receiving accreditation from the director as required under paragraph (2) of this section.
(d) Accredited training programs, training program managers, and principal instructors must comply with all of the requirements of this section including approved terms of the application and all the requirements and limitations specified in any accreditation documents issued to training programs.

(2) Application process. The following are procedures a training program must follow to receive director accreditation to offer lead-based paint activities courses, renovator courses, or dust sampling technician courses:
(a) A training program seeking accreditation shall submit a written application to the director containing the following information:
(i) The training program's name, address, and telephone number;
(ii) A list of courses for which it is applying for accreditation. For the purposes of this section, courses taught in different languages and electronic learning courses are considered different courses, and each must independently meet the accreditation requirements;
(iii) The name and documentation of the qualifications of the training program manager;
(iv) The name(s) and documentation of qualifications of any principal instructor(s); and
(v) A statement signed by the training program manager certifying that the training program meets the requirements established in paragraph (3) of this section. If a training program uses EPA-recommended model training materials, the training program manager shall include a statement certifying that, as well; or
(vi) If a training program does not use EPA-recommended model training materials, its application for accreditation shall also include:
(A) A copy of the student and instructor manuals, or other materials to be used for each course;
(B) A copy of the course agenda for each course; and
(C) When applying for accreditation of a course in a language other than English, a signed statement from a qualified, independent translator that they had compared the course to the English language version and found the translation to be accurate;
(vii) All training programs shall include in their application for accreditation the following:
(A) A description of the facilities and equipment to be used for lecture and hands-on training;
(B) A copy of the course test blueprint for each course;
(C) A description of the activities and procedures that will be used for conducting the assessment of hands-on skills for each course; and
(D) A copy of the quality control plan as described in paragraph (3)(i) of this section.
(b) If a training program meets the requirements in paragraph (3) of this section, then the director shall approve the application for accreditation no more than 180 days after receiving a complete application from the training program. In the case of approval, a certificate of accreditation shall be sent to the applicant. In the case of disapproval, a letter describing the reasons for disapproval shall be sent to the applicant. Prior to disapproval, the director may, at its discretion, work with the applicant to address inadequacies in the application for accreditation. The director may also request additional materials retained by the training program under paragraph (8) of this section. If a training program's application is disapproved, the program may reapply for accreditation at any time.
(c) A training program may apply for accreditation to offer initial courses or refresher courses in as many disciplines as it chooses. A training program may seek accreditation for additional courses at any time as long as the program can demonstrate that it meets the requirements of this section.
(d) A training program applying for accreditation must submit the appropriate fees in accordance with the current Department of Environmental Quality Fee Schedule.

(3) Requirements for the accreditation of training programs. A training program accredited by the director to offer lead-based paint activities courses, renovator courses, or dust sampling technician courses must meet the following requirements:
(a) The training program shall employ a training manager who has:
(i) At least 2 years of experience, education, or training in teaching workers or adults; or
(ii) A bachelor's or graduate degree in building construction technology, engineering, industrial hygiene, safety, public health, education, business administration or program management or a related field; or
(iii) Two years of experience in managing a training program specializing in environmental hazards; and
(iv) Demonstrated experience, education, or training in the construction industry including: lead or asbestos abatement, painting, carpentry, renovation, remodeling, occupational safety and health, or industrial hygiene.

(b) The training manager shall designate a qualified principal instructor for each course who has:
(i) Demonstrated experience, education, or training in teaching workers or adults; and
(ii) Successfully completed at least 16 hours of any director-accredited, EPA-accredited, or EPA-authorized state or tribal-accredited lead-specific training for instructors of lead-based paint activities courses or 8 hours of any director-accredited, EPA-accredited or EPA-authorized state or tribal-accredited lead-specific training for instructors of renovator or dust sampling technician courses; and
(iii) Demonstrated experience, education, or training in lead or asbestos abatement, painting, carpentry, renovation, remodeling, occupational safety and health, or industrial hygiene.

(c) The principal instructor shall be responsible for the organization of the course, course delivery, and oversight of the teaching of all course material. The training manager may designate guest instructors as needed for a portion of the course to provide instruction specific to the lecture, hands-on activities, or work practice components of a course. However, the principal instructor is primarily responsible for teaching the course materials and must be present to provide instruction (or oversight of portions of the course taught by guest instructors) for the course for which he or she has been designated the principal instructor.

2. Electronic Learning and other alternative course delivery methods are permitted for the classroom portion of renovator, dust sampling technician, or lead-based paint activities courses but not the hands-on portion of these courses, or for final course tests or proficiency tests described in paragraph (3)(g) of this section. Electronic learning courses must comply with the following requirements:
(A) A unique identifier must be assigned to each student for them to use to launch and re-launch the course;
(B) The training provider must track each student's course log-ins, launches, progress, and completion, and maintain these records in accordance with paragraph (8) of this section;
The course must include periodic knowledge checks equivalent to the number and content of the knowledge checks contained in EPA's model course, but at least 16 over the entire course. The knowledge checks must be successfully completed before the student can go on to the next module;

There must be a test of at least 20 questions at the end of the electronic learning portion of the course, of which 80% must be answered correctly by the student for successful completion of the electronic learning portion of the course. The test must be designed so that students do not receive feedback on their test answers until after they have completed and submitted the test; and

Each student must be able to save or print a copy of an electronic learning course completion certificate. The electronic certificate must not be susceptible to easy editing.

For each course offered, the training program shall conduct either a course test at the completion of the course, and if applicable, a hands-on skills assessment, or in the alternative, a proficiency test for that discipline. Each student must successfully complete the hands-on skills assessment and receive a passing score on the course test to pass any course, or successfully complete a proficiency test.

The training manager is responsible for maintaining the validity and integrity of the course test to ensure that it accurately evaluates the trainees' performance of the work practices and procedures associated with the course topics contained in paragraph (4) of this section;

The training manager is responsible for maintaining the validity and integrity of the course test to ensure that it accurately evaluates the trainees' knowledge and retention of the course topics; and

The course test shall be developed in accordance with the test blueprint submitted with the training accreditation application.

The training program shall issue unique course completion certificates to each individual who passes the training course. The course completion certificate shall include:

- The name, a unique identification number, and address of the individual;
- The name of the particular course that the individual completed;
- Dates of course completion/test passage;
- For initial inspector, risk assessor, project designer, supervisor, or abatement worker course completion certificates, the expiration date of interim certification, which is 6 months from the date of course completion;
- The name, address, and telephone number of the training program;
- The language in which the course was taught;
- For renovator and dust sampling technician course completion certificates, a photograph of the individual. The photograph must be an accurate and recognizable image of the individual. As reproduced on the certificate, the photograph must not be smaller than 1 square inch; and
- For renovator, dust sampling technician, or lead-based paint activities course completion certificates, the expiration date of the training certificate.

The training manager shall develop and implement a quality control plan. The plan shall be used to maintain and improve the quality of the training program over time. This plan shall contain at least the following elements:

- Procedures for periodic revision of training materials and the course test to reflect innovations in the field; and
- Procedures for the training manager's annual review of principal instructor competency.

Courses offered by the training program must teach the work practice standards contained in R307-841-5 or R307-842-3, as applicable, in such a manner that trainees are provided with the knowledge needed to perform the renovations or lead-based paint activities they will be responsible for conducting.

The training manager shall be responsible for ensuring that the training program complies at all times with all of the requirements in this section.

The training manager shall allow the director or the director's authorized representative to audit the training program to verify the contents of the application for accreditation as described in paragraph (2) of this section.

The training manager must provide notification of renovator, dust sampling technician, or lead-based paint activities courses offered.

The training manager must provide the director with notification of all renovator, dust sampling technician, or lead-based paint activities courses offered except for any renovator course without hands-on training delivered via electronic learning. The original notification must be received by the director at least 7 business days prior to the start date of any renovator, dust sampling technician, or lead-based paint activities course;

(i) The training manager must provide the director with notification of all renovator, dust sampling technician, or lead-based paint activities courses offered except for any renovator course without hands-on training delivered via electronic learning. The original notification must be received by the director at least 7 business days prior to the start date of any renovator, dust sampling technician, or lead-based paint activities course;

(ii) The training manager must provide the director updated notification when renovator, dust sampling technician, or lead-based paint activities courses will begin on a date other than the start date specified in the original notification, as follows:

(A) For renovator, dust sampling technician, or lead-based paint activities courses beginning prior to the start date provided to the director, an updated notification must be received by the director at least 7 business days before the new start date; and

(B) For renovator, dust sampling technician, or lead-based paint activities courses beginning after the start date provided to the director, an updated notification must be received by the director at least 2 business days before the start date provided to the director;

(iii) The training manager must update the director of any change in location of renovator, dust sampling technician, or lead-based paint activities courses at least 7 business days prior to the start date provided to the director;
(iv) The training manager must update the director regarding any course cancellations, or any other change to the original notification. Updated notifications must be received by the director at least 2 business days prior to the start date provided to the director;

(v) Each notification, including updates, must include the following:

(A) Notification type (original, update, or cancellation);

(B) Training program name, address, and telephone number;

(C) Course discipline, type (initial/refresher), and the language in which instruction will be given;

(D) Date(s) and time(s) of training;

(E) Training location(s) telephone number, and address;

(F) Principal instructor's name; and

(G) Training manager's name and signature;

(vi) Notification must be accomplished using any of the following methods: Written notification, or electronically using the Utah Division of Air Quality electronic notification system. Written notification of renovator, dust sampling technician, or lead-based paint activities course schedules can be accomplished by using either the sample form titled "Renovator, Dust Sampling Technician, or Lead-Based Paint Activities Training Course Notification Form" or a similar form containing the information required in paragraph (3)(m)(v) of this section. All written notifications must be delivered to the director by United States Postal Service, fax, commercial delivery service, hand delivery, or by email. Instructions and sample forms can be obtained from the Utah Division of Air Quality Lead-Based Paint Program web site;

(vii) Renovator, dust sampling technician, or lead-based paint activities courses must not begin on a date, or at a location other than that specified in the original notification unless an updated notification identifying a new start date or location is submitted, in which case the course must begin on the new start date and/or location specified in the updated notification; and

(viii) No training program shall provide renovator, dust sampling technician, or lead-based paint activities courses without first notifying the director of such activities in accordance with the requirements of this paragraph.

(n) The training manager must provide notification following completion of renovator, dust sampling technician, or lead-based paint activities courses.

(i) The training manager must provide the director notification after the completion of any renovator, dust sampling technician, or lead-based paint activities course. This notification must be received by the director no later than 10 business days following course completion. Notifications for any e-learning renovator refresher course that does not include hands-on training must be submitted via written notification or electronically using the Utah Division of Air Quality electronic notification system no later than the 10th day of the month and include all students trained in the previous month. Written notification for any e-learning renovator refresher course, can be accomplished by using either the sample form titled "Renovator, Dust Sampling Technician, or Lead-Based Paint Activities Training Course Notification Form" or a similar form containing the information required in paragraph (3)(n)(ii) of this section. All written notifications must be delivered to the director by United States Postal Service, fax, commercial delivery service, hand delivery, or by email. Instructions and sample forms can be obtained from the Utah Division of Air Quality Lead-Based Paint Program web site;

(ii) The notification must include the following:

(A) Training program name, address, and telephone number;

(B) Course discipline and type (initial/refresher);

(C) Date(s) of training;

(D) The following information for each student who took the course:

(I) Name,

(II) Address,

(III) Date of birth,

(IV) Course completion certificate number,

(V) Course test score,

(VI) For renovator or dust sampling technician courses, a digital photograph of the student, and

(VII) For renovator refresher courses, the expiration date of the training certificate;

(E) Training manager's name and signature; and

(F) Utah Division of Air Quality Lead-Based Paint Program training verification statement.

(iii) Notification must be accomplished using any of the following methods: Written notification, or electronically using the Utah Division of Air Quality electronic notification system. Written notification following renovator, dust sampling technician, or lead-based paint activities training courses can be accomplished by using either the sample form titled "Renovator, Dust Sampling Technician, or Lead-Based Paint Activities Training Course Notification Form" or a similar form containing the information required in paragraph (3)(n)(ii) of this section. All written notifications must be delivered to the director by United States Postal Service, fax, commercial delivery service, hand delivery, or by email. Instructions and sample forms can be obtained from the Utah Division of Air Quality Lead-Based Paint Program web site;

(4) Minimum training curriculum requirements. A training program accredited by the director to offer lead-based paint courses in the specific disciplines listed in paragraph (4) must ensure that its courses of study include, at a minimum, the following course topics.

(a) Inspector. Instruction in the topics described in paragraphs (4)(a)(iv), (v), (vi), and (vii) of this section must be included in
the hands-on portion of the course.

(i) Role and responsibilities of an inspector;
(ii) Background information on lead and its adverse health effects;
(iii) Background information on federal, state, and local regulations and guidance that pertains to lead-based paint and lead-based paint activities;
(iv) Lead-based paint inspection methods, including selection of rooms and components for sampling or testing;
(v) Paint, dust, and soil sampling methodologies;
(vi) Clearance standards and testing, including random sampling;
(vii) Preparation of the final inspection report; and
(viii) Recordkeeping.

(b) Risk assessor. Instruction in the topics described in paragraphs (4)(b)(iv), (vi), and (vii) of this section must be included in the hands-on portion of the course.

(i) Role and responsibilities of a risk assessor;
(ii) Collection of background information to perform a risk assessment;
(iii) Sources of environmental lead contamination such as paint, surface dust and soil, water, air, packaging, and food;
(iv) Visual inspection for the purposes of identifying potential sources of lead-based paint hazards;
(v) Lead hazard screen protocol;
(vi) Sampling for other sources of lead exposure;
(vii) Interpretation of lead-based paint and other lead sampling results, including all applicable federal or state guidance or regulations pertaining to lead-based paint hazards;
(viii) Development of hazard control options, the role of interim controls, and operations and maintenance activities to reduce lead-based paint hazards; and
(ix) Preparation of a final risk assessment report.

(c) Supervisor. Instruction in the topics described in paragraphs (4)(c)(v), (vii), (viii), (ix), and (x) of this section must be included in the hands-on portion of the course.

(i) Role and responsibilities of a supervisor;
(ii) Background information on lead and its adverse health effects;
(iii) Background information on federal, state, and local regulations and guidance that pertain to lead-based paint abatement;
(iv) Liability and insurance issues relating to lead-based paint abatement;
(v) Risk assessment and inspection report interpretation;
(vi) Development and implementation of an occupant protection plan and abatement report;
(vii) Lead-based paint hazard recognition and control;
(viii) Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices;
(ix) Interior dust abatement/cleanup or lead-based paint hazard control and reduction methods;
(x) Soil and exterior dust abatement or lead-based paint hazard control and reduction methods;
(xi) Clearance standards and testing;
(xii) Cleanup and waste disposal; and
(xiii) Recordkeeping.

(d) Project designer.

(i) Role and responsibilities of a project designer;
(ii) Development and implementation of an occupant protection plan for large-scale abatement projects;
(iii) Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices for large-scale abatement projects;
(iv) Interior dust abatement/cleanup or lead hazard control and reduction methods for large-scale abatement projects;
(v) Clearance standards and testing for large scale abatement projects; and
(vi) Integration of lead-based paint abatement methods with modernization and rehabilitation projects for large scale abatement projects.

(e) Abatement worker. Instruction in the topics described in paragraphs (4)(e)(iv), (v), (vi), and (vii) of this section must be included in the hands-on portion of the course.

(i) Role and responsibilities of an abatement worker;
(ii) Background information on lead and its adverse health effects;
(iii) Background information on federal, state, and local regulations and guidance that pertain to lead-based paint abatement;
(iv) Lead-based paint hazard recognition and control;
(v) Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices;
(vi) Interior dust abatement methods/cleanup or lead-based paint hazard reduction; and
(vii) Soil and exterior dust abatement methods or lead-based paint hazard reduction.

(f) Renovator. Instruction in the topics described in paragraphs (4)(f)(iv), (vi), (vii), and (viii) of this section must be included in
the hands-on portion of the course.

(i) Role and responsibility of a renovator;

(ii) Background information on lead and its adverse health effects;

(iii) Background information on EPA, HUD, OSHA, and other federal, state, and local regulations and guidance that pertains to lead-based paint and renovation activities;

(iv) Procedures for using acceptable test kits to determine whether paint is lead-based paint;

(v) Procedures for collecting a paint chip sample and sending it to a laboratory recognized by EPA under section 405(b) of TSCA;

(vi) Renovation methods to minimize the creation of dust and lead-based paint hazards;

(vii) Interior and exterior containment and cleanup methods;

(viii) Methods to ensure that the renovation has been properly completed, including cleaning verification, and clearance testing;

(ix) Waste handling and disposal;

(x) Providing on-the-job training to other workers; and

(xi) Record preparation.

(g) Dust sampling technician. Instruction in the topics described in paragraphs (4)(g)(iv) and (vi) of this section must be included in the hands-on portion of the course.

(i) Role and responsibility of a dust sampling technician;

(ii) Background information on lead and its adverse health effects;

(iii) Background information on federal, state, and local regulations and guidance that pertains to lead-based paint and renovation activities;

(iv) Dust sampling methodologies;

(v) Clearance standards and testing; and


(5) Requirements for the accreditation of refresher training programs. A training program may seek accreditation to offer refresher training courses in any of the following disciplines: Inspector, risk assessor, supervisor, project designer, abatement worker, renovator, and dust sampling technician. A training program accredited by the director to offer refresher training must meet the following minimum requirements:

(a) Each refresher course shall review the curriculum topics of the full-length courses listed under paragraph (4) of this section, as appropriate. In addition, to become accredited to offer refresher training courses, training programs shall ensure that their courses of study include, at a minimum, the following:

(i) An overview of current safety practices relating to lead-based paint in general, as well as specific information pertaining to the appropriate discipline;

(ii) Current laws and regulations relating to lead-based paint in general, as well as specific information pertaining to the appropriate discipline; and

(iii) Current technologies relating to lead-based paint in general, as well as specific information pertaining to the appropriate discipline;

(b) Refresher courses for inspector, risk assessor, supervisor, and abatement worker must last a minimum of 8 training hours. Refresher courses for project designer, renovator, and dust sampling technician must last a minimum of 4 training hours. Refresher courses for all disciplines except renovator and project designer must include a hands-on component. Renovators must take a refresher course that includes hands-on training at least every other re-certification;

(c) Except for e-learning renovator refresher courses and project designer courses, for all other courses offered, the training program shall conduct a hands-on assessment. With the exception of project designer courses, the training program shall conduct a course test at the completion of the course. Renovators must take a refresher course that includes hands-on training at least every other re-certification;

(d) A training program may apply for accreditation of a refresher course concurrently with its application for accreditation of the corresponding initial training course as described in paragraph (2) of this section. If so, the director shall use the approval procedure described in paragraph (2) of this section. In addition, the minimum requirements contained in paragraphs (3)(a) through (3)(e), (3)(f)(viii), and (3)(g) through (3)(n), and (5)(a) through (5)(c) of this section shall also apply; and

(e) A training program seeking accreditation to offer refresher training courses only shall submit a written application to the director containing the following information:

(i) The refresher training program's name, address, and telephone number;

(ii) A list of courses for which it is applying for accreditation;

(iii) The name and documentation of the qualifications of the training program manager;

(iv) The name(s) and documentation of the qualifications of the principal instructor(s);

(v) A statement signed by the training program manager certifying that the refresher training program meets the minimum requirements established in paragraph (3) of this section, except for the requirements in paragraph (3)(f) of this section. If a training program uses EPA-developed model training materials, the training manager shall include a statement certifying that, as well;
(viii) If the refresher training course materials are not based on EPA-developed model training materials, the training program's application for accreditation shall include:

(A) A copy of the student and instructor manuals to be used for each course; and
(B) A copy of the course agenda for each course;

(vii) All refresher training programs shall include in their application for accreditation the following:

(A) A description of the facilities and equipment to be used for lecture and hands-on training;
(B) A copy of the course test blueprint for each course;
(C) A description of the activities and procedures that will be used for conducting the assessment of hands-on skills for each course (if applicable); and
(D) A copy of the quality control plan as described in paragraph (3)(i) of this section;
(viii) The requirements in paragraphs (3)(a) through (3)(e), (3)(f)(viii) and (3)(g) through (3)(n) of this section apply to refresher training providers; and
(ix) If a refresher training program meets the requirements listed in this paragraph, then the director shall approve the application for accreditation no more than 180 days after receiving a complete application from the refresher training program. In the case of approval, a certificate of accreditation shall be sent to the applicant. Prior to disapproval, the director may, at the director's discretion, work with the applicant to address inadequacies in the application for accreditation. The director may also request additional materials retained by the refresher training program under paragraph (8) of this section. If a refresher training program's application is disapproved, the program may reapply for accreditation at any time.

(6) Re-accreditation of training programs.

(a) Unless re-accredited, a training program's accreditation, including refresher training accreditation, shall expire 4 years after the date of issuance. If a training program meets the requirements of this section, the training program shall be re-accredited.
(b) A training program seeking re-accreditation shall submit an application to the director no later than 180 days before its accreditation expires. If a training program does not submit its application for re-accreditation by that date, the director cannot guarantee that the program will be re-accredited before the end of the accreditation period.
(c) The training program's application for re-accreditation shall contain:
(i) The training program's name, address, and telephone number;
(ii) A list of courses for which it is applying for re-accreditation;
(iii) The name and qualifications of the training program manager;
(iv) The name(s) and qualifications of the principal instructor(s);
(v) A description of any changes to the training facility, equipment or course materials since its last application was approved that adversely affects the students' ability to learn;
(vi) A statement signed by the program manager stating:
(A) That the training program complies at all times with all requirements in paragraphs (3) and (5) of this section, as applicable; and
(B) The recordkeeping and reporting requirements of paragraph (8) of this section shall be followed; and
(vii) A payment of appropriate fees in accordance with the current Department of Environmental Quality Fee Schedule.
(d) Upon request, the training program shall allow the director or the director's authorized representative to audit the training program to verify the contents of the application for re-accreditation as described in paragraph (6)(c) of this section.

(7) Suspension, revocation, and modification of accredited training programs.

(a) The director may, after notice and an opportunity, for hearing, suspend, revoke, or modify training program accreditation, including refresher training accreditation, if a training program, training manager, or other person with supervisory authority over the training program has:
(i) Misrepresented the contents of a training course to the director and/or the student population;
(ii) Failed to submit required information or notifications in a timely manner;
(iii) Failed to maintain required records;
(iv) Falsified accreditation records, instructor qualifications, or other accreditation-related information or documentation;
(v) Failed to comply with the training standards and requirements in this section;
(vi) Failed to comply with federal, state, or local lead-based paint statutes or regulations; or
(vii) Made false or misleading statements to the director in its application for accreditation or re-accreditation which the director relied upon in approving the application.
(b) In addition to an administrative or judicial finding of violation, execution of a consent agreement in settlement of an enforcement action constitutes, for purposes of this section, evidence of a failure to comply with relevant statutes or regulations.

(8) Training program recordkeeping requirements.

(a) Accredited training programs shall maintain, and make available to the director or the director's authorized representative, upon request, the following records:
(i) All documents specified in paragraph (3)(d) of this section that demonstrate the qualifications listed in paragraphs (3)(a) and
(3)(b) of this section of the training manager and principal instructors;
   (ii) Current curriculum/course materials and documents reflecting any changes made to these materials;
   (iii) The course test blueprint;
   (iv) Information regarding how the hands-on assessment is conducted including, but not limited to:
   (A) Who conducts the assessment;
   (B) How the skills are graded;
   (C) What facilities are used; and
   (D) The pass/fail rate;
   (v) The quality control plan as described in paragraph (3)(i) of this section;
   (vi) Results of the students' hands-on skills assessments and course tests, and a record of each student's course completion certificate;
   (vii) Any other material not listed in paragraphs (8)(a)(i) through (8)(a)(vi) of this section that was submitted to the director as part of the program's application for accreditation.
   (viii) For renovator refresher and dust sampling technician refresher courses, a copy of each trainee's prior course completion certificate showing that each trainee was eligible to take the refresher course; and
   (ix) For course modules delivered in an electronic format, a record of each student's log-ins, launches, progress, and completion, and a copy of the electronic learning completion certificate for each student.

(b) The training program must retain records pertaining to renovator, dust sampling technician and lead-based paint activities courses at the address specified on the training program accreditation application (or as modified in accordance with paragraph (8)(c) of this section) for the following minimum periods:
   (i) Records pertaining to lead-based paint activities courses must be retained for a minimum of 3 years and 6 months;
   (ii) Records pertaining to renovator or dust sampling technician courses offered must be retained for a minimum of 5 years and 6 months.

(c) The training program shall notify the director in writing within 30 days of changing the address specified on its training program accreditation application or transferring the records from that address.

(9) Amendment of accreditation.
   (a) A training program must amend its accreditation within 90 days of the date a change occurs to information included in the program's most recent application. If the training program fails to amend its accreditation within 90 days of the date the change occurs, the program may not provide renovator, dust sampling technician, or lead-based paint activities training until its accreditation is amended.
   (b) To amend an accreditation, a training program must submit a completed Division of Air Quality Lead-Based Paint Application for Course Accreditation, signed by an authorized agent of the training provider, noting on the form that it is submitted as an amendment and indicating the information that has changed.

(c) Training managers, principal instructors, permanent training locations. If the amendment includes a new training program manager, any new or additional principal instructor(s), or any new permanent training location(s), the training provider is not permitted to provide training under the new training manager or offer courses taught by any new principal instructor(s) or at the new training location(s) until the director either approves the amendment or 30 days have elapsed, whichever occurs earlier. Except:
   (i) If the amendment includes a new training program manager or new or additional principal instructor that was identified in a training provider accreditation application that the director has already approved under this section, the training provider may begin to provide training under the new training manager or offer courses taught by the new principal instructor on an interim basis as soon as the provider submits the amendment to the director. The training provider may continue to provide training under the new training manager or offer courses taught by the new principal instructor if the director approves the amendment or if the director does not disapprove the amendment within 30 days.
   (ii) If the amendment includes a new permanent training location, the training provider may begin to provide training at the new permanent training location on an interim basis as soon as the provider submits the amendment to the director. The training provider may continue to provide training at the new permanent training location if the director approves the amendment or if the director does not disapprove the amendment within 30 days.

R307-842-2. Certification of Individuals and Firms Engaged in Lead-Based Paint Activities: Target Housing and Child-Occupied Facilities.

(1) Certification of individuals.
   (a) Individuals seeking certification by the director to engage in lead-based paint activities must either:
   (i) Submit to the director an application demonstrating that they meet the requirements established in paragraphs (2) or (3) of this section for the particular discipline for which certification is sought; or
   (ii) Submit to the director an application with a copy of a valid lead-based paint activities certification (or equivalent) from the EPA or a state or tribal program that has been authorized by EPA pursuant to subpart Q of 40 CFR 745; or
   (iii) For supervisor, inspector, and/or risk assessor certification, submit to the director an application with a copy of a valid lead-based paint training certificate from an EPA-accredited, or EPA-authorized state or tribal-accredited lead-specific training in the
appropriate discipline and pass the certification exam in the appropriate discipline offered by the director.

(b) Following the submission of an application demonstrating that all the requirements of this section have been met, the director shall certify an applicant as an inspector, risk assessor, supervisor, project designer, or abatement worker, as appropriate.

(c) Upon receiving director certification, individuals conducting lead-based paint activities shall comply with the work practice standards for performing the appropriate lead-based paint activities as established in R307-842-3.

(d) It shall be a violation of state administrative rules for an individual to conduct any of the lead-based paint activities described in R307-842-3 if that individual has not been certified by the director pursuant to this section to do so.

(e) Individuals applying for certification must submit the appropriate fees in accordance with the current Department of Environmental Quality Fee Schedule.

(2) Inspector, risk assessor or supervisor.

(a) To become certified by the director as an inspector, risk assessor, or supervisor, pursuant to paragraph (1)(a)(i) of this section, an individual must:

(i) Successfully complete an accredited initial training course in the appropriate discipline and receive a course completion certificate from an accredited training program;

(ii) Pass the certification exam in the appropriate discipline offered by the director; and

(iii) Meet or exceed the following experience and/or education requirements:

(A) Inspectors. No additional experience and/or education requirements;

(B) Risk assessors.

(I) Successful completion of an accredited initial training course for inspectors; and

(II) Bachelor's degree and 1 year of experience in a related field (e.g., lead, asbestos, environmental remediation work, or construction), or an Associates degree and 2 years experience in a related field (e.g., lead, asbestos, environmental remediation work, or construction); or

(III) Certification as an industrial hygienist, professional engineer, registered architect and/or certification in a related engineering/health/environmental field (e.g., safety professional, environmental scientist); or

(IV) A high school diploma (or equivalent), and at least 3 years of experience in a related field (e.g., lead, asbestos, environmental remediation work or construction);

(C) Supervisor.

(I) One year of experience as a certified lead-based paint abatement worker; or

(II) At least 2 years of experience in a related field (e.g., lead, asbestos, or environmental remediation work) or in the building trades.

(b) The following documents shall be recognized by the director as evidence of meeting the requirements listed in (2)(b)(iii) of this paragraph:

(i) Official academic transcripts or diploma, as evidence of meeting the education requirements;

(ii) Resumes, letters of reference, or documentation of work experience, as evidence of meeting the work experience requirements; and

(iii) Course completion certificates from lead-specific or other related training courses, issued by accredited training programs, as evidence of meeting the training requirements.

(c) In order to take the certification examination for a particular discipline an individual must:

(i) Successfully complete an accredited initial training course in the appropriate discipline and receive a course completion certificate from an accredited training program; and

(ii) Meet or exceed the education and/or experience requirements in paragraph (2)(a)(iii) of this section.

(d) The initial training course completion certificate shall serve as interim certification for an individual until the next available opportunity to take the certification exam. Such interim certification shall expire 6 months after issuance.

(e) After passing the appropriate certification exam and submitting an application demonstrating that he/she meets the appropriate training, education, and/or experience prerequisites described in paragraph (2)(a) of this section, an individual shall be issued a certificate by the director. To maintain certification, an individual must be re-certified as described in paragraph (4) of this section.

(f) An individual may take the certification exam no more than three times within 6 months of receiving an initial training course completion certificate.

(g) If an individual does not pass the certification exam and receive a certificate within 6 months of receiving his/her initial training course completion certificate, the individual must retake the appropriate initial training course from an accredited training program before reappplying for certification from the director.

(3) Abatement worker and project designer.

(a) To become certified by the director as an abatement worker or project designer, pursuant to paragraph (1)(a)(i) of this section, an individual must:

(i) Successfully complete an accredited initial training course in the appropriate discipline and receive a course completion certificate from an accredited training program; and

(ii) Meet or exceed the following additional experience and/or education requirements:
(A) Abatement workers. No additional experience and/or education requirements; and

(B) Project designers.

(I) Successful completion of an accredited initial training course for supervisors;

(II) Bachelor's degree in engineering, architecture, or a related profession, and 1 year of experience in building construction and design or a related field; or

(III) Four years of experience in building construction and design or a related field.

(b) The following documents shall be recognized by the director as evidence of meeting the requirements listed in this paragraph:

(i) Official academic transcripts or diploma, as evidence of meeting the education requirements;

(ii) Resumes, letters of reference, or documentation of work experience, as evidence of meeting the work experience requirements; and

(iii) Course completion certificates from lead-specific or other related training courses, issued by accredited training programs, as evidence of meeting the training requirements.

(c) The initial training course completion certificate shall serve as an interim certification until certification from the director is received, but shall be valid for no more than 6 months from the date of completion.

(d) After successfully completing the appropriate initial training courses and meeting any other qualifications described in paragraph (3)(a) of this section, an individual shall be issued a certificate from the director. To maintain certification, an individual must be re-certified as described in paragraph (4) of this section.

(4) Re-certification.

(a) To maintain certification in a particular discipline, a certified individual shall apply to and be re-certified by the director in that discipline by the director either:

(i) Every 3 years if the individual completed a training course with a course test and hands-on assessment; or

(ii) Every 5 years if the individual completed a training course with a proficiency test.

(b) An individual shall be re-certified if the individual successfully completes the appropriate accredited refresher training course and submits a valid copy of the appropriate refresher training course completion certificate. For the supervisor, inspector, or risk assessor disciplines, if more than 3 years but less than 4 years have passed since certification or re-certification for an individual that completed an initial or a refresher training course with a course test and hands-on assessment, or if more than 5 years but less than 6 years have passed since certification or re-certification for an individual that completed an initial or a refresher training course with a proficiency test, then the individual must also pass the certification exam in the appropriate discipline offered by the director. During the time period when the individual is not certified by the director, that individual cannot perform any regulated work activities that requires individual certification.

(c) Individuals applying for re-certification must submit the appropriate fees in accordance with the current Department of Environmental Quality Fee Schedule.

(5) Certification of firms.

(a) All firms which perform or offer to perform any of the lead-based paint activities or renovations described in R307-842-3 shall be certified by the director.

(b) A firm seeking certification shall submit to the director a letter attesting that the firm shall only employ appropriately certified employees to conduct lead-based paint activities, and that the firm and its employees shall follow the work practice standards in R307-842-3 for conducting lead-based paint activities.

(c) From the date of receiving the firm's letter requesting certification, the director shall have 90 days to approve or disapprove the firm's request for certification. Within that time, the director shall respond with either a certificate of approval or a letter describing the reasons for disapproval.

(d) The firm shall maintain all records pursuant to the requirements in R307-842-3.

(e) Firms may apply to the director for certification to engage in lead-based paint activities pursuant to this section.

(f) Firms applying for certification or re-certification must submit the appropriate fees in accordance with the current Department of Environmental Quality Fee Schedule.

(6) Suspension, revocation, and modification of certifications of individuals engaged in lead-based paint activities.

(a) The director may, after notice and opportunity for hearing, suspend, revoke, or modify an individual's certification if an individual has:

(i) Obtained training documentation through fraudulent means;

(ii) Gained admission to and completed an accredited training program through misrepresentation of admission requirements;

(iii) Obtained certification through misrepresentation of certification requirements or related documents dealing with education, training, professional registration, or experience;

(iv) Performed work requiring certification at a job site without having proof of certification;

(v) Permitted the duplication or use of the individual's own certificate by another;

(vi) Performed work for which certification is required, but for which appropriate certification has not been received;

(vii) Failed to comply with the appropriate work practice standards for lead-based paint activities at R307-842-3; or

(viii) Failed to comply with federal, state, or local lead-based paint statutes or regulations.
(7) Suspension, revocation, and modification of certifications of firms engaged in lead-based paint activities.

(a) The director may, after notice and opportunity for hearing, suspend, revoke, or modify a firm’s certification if a firm has:

(i) Failed to comply with the work practice standards established in R307-842-3;

(ii) Mislabeled facts in its letter of application for certification to the director;

(iii) Failed to maintain required records; or

(iv) Failed to comply with federal, state, or local lead-based paint statutes or regulations.

(b) In addition to an administrative or judicial finding of violation, for purposes of this section only, execution of a consent agreement in settlement of an enforcement action constitutes evidence of a failure to comply with relevant statutes or regulations.

R307-842-3. Work Practice Standards for Conducting Lead-Based Paint Activities: Target Housing and Child-Occupied Facilities.

(1) Effective date, applicability, and terms.

(a) All lead-based paint activities shall be performed pursuant to the work practice standards contained in this section.

(b) When performing any lead-based paint activity described by the certified individual as an inspection, lead-hazard screen, risk assessment, or abatement, a certified individual must perform that activity in compliance with the appropriate requirements below.

(c) Documented methodologies that are appropriate for this section are found in the following: the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, the EPA Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead-Contaminated Soil, the EPA Residential Sampling for Lead: Protocols for Dust and Soil Sampling (EPA report number 7474-R-95-001), and other equivalent methods and guidelines.

(d) Clearance levels are appropriate for the purposes of this section may be found in the EPA Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead Contaminated Soil or other equivalent guidelines.

(2) Inspection.

(a) An inspection shall be conducted only by a person certified by the director as an inspector or risk assessor and, if conducted, must be conducted according to the procedures in this paragraph.

(b) When conducting an inspection, the following locations shall be selected according to documented methodologies and tested for the presence of lead-based paint:

(i) In a residential dwelling and child-occupied facility, each component with a distinct painting history and each exterior component with a distinct painting history shall be tested for lead-based paint, except those components that the inspector or risk assessor determines to have been replaced after 1978, or to not contain lead-based paint; and

(ii) In a multi-family dwelling or child-occupied facility, each component with a distinct painting history in every common area, except those components that the inspector or risk assessor determines to have been replaced after 1978, or to not contain lead-based paint.

(c) Paint shall be sampled in the following manner:

(i) The analysis of paint to determine the presence of lead shall be conducted using documented methodologies which incorporate adequate quality control procedures; and/or

(ii) All collected paint chip samples shall be analyzed according to paragraph (6) of this section to determine if they contain detectable levels of lead that can be quantified numerically.

(d) The certified inspector or risk assessor shall prepare an inspection report which shall include the following information:

(i) Date of each inspection;

(ii) Address of building;

(iii) Date of construction;

(iv) Apartment numbers (if applicable);

(v) Name, address, and telephone number of the owner or owners of each residential dwelling or child-occupied facility;

(vi) Name, signature, and certification number of each certified inspector and/or risk assessor conducting testing;

(vii) Name, address, and telephone number of the certified firm employing each inspector and/or risk assessor, if applicable;

(viii) Each testing method and device and/or sampling procedure employed for paint analysis, including quality control data and, if used, the serial number of any x-ray fluorescence (XRF) device;

(ix) Specific locations of each painted component tested for the presence of lead-based paint; and

(x) The results of the inspection expressed in terms appropriate to the sampling method used.

(3) Lead hazard screen.

(a) A lead hazard screen shall be conducted only by a person certified by the director as a risk assessor.

(b) If conducted, a lead hazard screen shall be conducted as follows:

(i) Background information regarding the physical characteristics of the residential dwelling or child-occupied facility and occupant use patterns that may cause lead-based paint exposure to one or more children age 6 years and under shall be collected;

(ii) A visual inspection of the residential dwelling or child-occupied facility shall be conducted to:
A visual inspection for risk assessment of the residential dwelling or child-occupied facility shall be undertaken to locate the existence of deteriorated paint, assess the extent and causes of the deterioration, and other potential lead-based paint hazards. Conducted according to the procedures in this paragraph.

Risk assessment shall be conducted only by a person certified by the director as a risk assessor and, if conducted, must be conducted according to the procedures in this paragraph.

The information required in a risk assessment report as specified in paragraph (4) of this section, including paragraphs (4)(k)(i) through (4)(k)(xiv), and excluding paragraphs (4)(k)(xv) through (4)(k)(xviii) of this section. Additionally, any background information collected pursuant to paragraph (3)(b)(i) of this section shall be included in the lead hazard screen report; and recommendations, if warranted, for a follow-up risk assessment, and as appropriate, any further actions.

Risk assessment.

A risk assessment shall be conducted only by a person certified by the director as a risk assessor and, if conducted, must be conducted according to the procedures in this paragraph.

A visual inspection for risk assessment of the residential dwelling or child-occupied facility shall be undertaken to locate the existence of deteriorated paint, assess the extent and causes of the deterioration, and other potential lead-based paint hazards.

Background information regarding the physical characteristics of the residential dwelling or child-occupied facility and occupant use patterns that may cause lead-based paint exposure to one or more children age 6 years and under shall be collected.

The surfaces which are determined, using documented methodologies, to have a distinct painting history, shall be tested for the presence of lead:

(i) Each friction surface or impact surface with visibly deteriorated paint; and
(ii) All other surfaces with visibly deteriorated paint.

In residential dwellings, dust samples (either composite or single-surface samples) from the interior window sill(s) and floor shall be collected and analyzed for lead concentration in all living areas where one or more children, age 6 and under, are most likely to come into contact with dust.

For multi-family dwellings and child-occupied facilities, the samples required in paragraph (4)(d) of this section shall be taken. In addition, interior window sill and floor dust samples (either composite or single-surface samples) shall be collected and analyzed for lead concentration in the following locations:

(i) Common areas adjacent to the sampled residential dwelling or child-occupied facility; and
(ii) Other common areas in the building where the risk assessor determines that one or more children, age 6 and under, are likely to come into contact with dust.

For child-occupied facilities, interior window sill and floor dust samples (either composite or single-surface samples) shall be collected and analyzed for lead concentration in each room, hallway, or stairwell utilized by one or more children, age 6 and under, and in other common areas in the child-occupied facility where one or more children, age 6 and under, are likely to come into contact with dust.

Soil samples shall be collected and analyzed for lead concentrations in the following locations:

(i) Exterior play areas where bare soil is present;
(ii) The rest of the yard (i.e., non-play areas) where bare soil is present; and
(iii) Driveway areas where bare soil is present.

Any paint, dust, or soil sampling or testing shall be conducted using documented methodologies that incorporate adequate quality control procedures.

Any collected paint chip, dust, or soil samples shall be analyzed according to paragraph (6) of this section to determine if they contain detectable levels of lead that can be quantified numerically.

The Certified risk assessor shall prepare a risk assessment report which shall include the following information:

(i) Date of assessment;
(ii) Address of each building;
(iii) Date of construction of buildings;
(iv) Apartment number (if applicable);
(v) Name, address, and telephone number of each owner of each building;
(vi) Name, signature, and certification number of the certified risk assessor conducting the assessment;
(vii) Name, address, and telephone number of the certified firm employing each certified risk assessor if applicable;
(viii) Name, address, and telephone number of each recognized laboratory conducting analysis of collected samples;
(ix) Results of the visual inspection;
(x) Testing method and sampling procedure for paint analysis employed;
(xi) Specific locations of each painted component tested for the presence of lead;
(xii) All data collected from on-site testing, including quality control data and, if used, the serial number of any XRF device.
(xiii) All results of laboratory analysis on collected paint, soil, and dust samples;
(xiv) Any other sampling results;
(xv) Any background information collected pursuant to paragraph (4)(c) of this section;
(xvi) To the extent that they are used as part of the lead-based paint hazard determination, the results of any previous inspections or analyses for the presence of lead-based paint, or other assessments of lead-based paint-related hazards;
(xvii) A description of the location, type, and severity of identified lead-based paint hazards and any other potential lead hazards;
(xviii) A description of interim controls and/or abatement options for each identified lead-based paint hazard and a suggested prioritization for addressing each hazard. If the use of an encapsulant or enclosure is recommended, the report shall recommend a maintenance and monitoring schedule for the encapsulant or enclosure.

(5) Abatement.
(a) An abatement shall be conducted only by an individual certified by the director, and if conducted, shall be conducted according to the procedures in this paragraph.
(b) A certified supervisor is required for each abatement project and shall be onsite during all work site preparation and during the post-abatement cleanup of work areas. At all other times when abatement activities are being conducted, the certified supervisor shall be onsite or available by telephone, pager or answering service, and able to be present at the work site in no more than 2 hours.
(c) The certified supervisor and the certified firm employing that supervisor shall ensure that all abatement activities are conducted according to the requirements of this section and all other federal, state, and local requirements.
(d) A certified firm must notify the director of lead-based paint abatement activities as follows:
(i) Except as provided in paragraph (5)(d)(ii) of this section, the director must be notified prior to conducting lead-based paint abatement activities. The original notification must be received by the director at least 5 business days before the start date of any lead-based paint abatement activities;
(ii) Notification for lead-based paint abatement activities required in response to an elevated blood lead level (EBL) determination, or federal, state, tribal, or local emergency abatement order should be received by the director as early as possible before, but must be received no later than the start date of the lead-based paint abatement activities. Should the start date and/or location provided to the director change, an updated notification must be received by the director on or before the start date provided to the director. Documentation showing evidence of an EBL determination or a copy of the federal/state/tribal/local emergency abatement order must be included in the written notification to take advantage of this abbreviated notification period;
(iii) Except as provided in paragraph (5)(d)(ii) of this section, updated notification must be provided to the director for lead-based paint abatement activities that will begin on a date other than the start date specified in the original notification, as follows:
(A) For lead-based paint abatement activities beginning prior to the start date provided to the director an updated notification must be received by the director at least 5 business days before the new start date included in the notification; and
(B) For lead-based paint abatement activities beginning after the start date provided to the director an updated notification must be received by the director on or before the start date provided to the director;
(iv) Except as provided in paragraph (5)(d)(ii) of this section, updated notification must be provided to the director for any change in location of lead-based paint abatement activities at least 5 business days prior to the start date provided to the director;
(v) Updated notification must be provided to the director when lead-based paint abatement activities are canceled, or when there are other significant changes including, but not limited to, when the square footage or acreage to be abated changes by more than 20%. This updated notification must be received by the director on or before the start date provided to the director, or if work has already begun, within 24 hours of the change;
(vi) The following must be included in each notification:
(A) Notification type (original, updated, or cancellation);
(B) Date when lead-based paint abatement activities will start;
(C) Date when lead-based paint abatement activities will end (approximation using best professional judgment);
(D) Firm's name, Utah lead-based paint firm certification number, address, and telephone number;
(E) Type of building (e.g., single family dwelling, multi-family dwelling, and/or child-occupied facilities) on/in which abatement work will be performed;
The occupant protection plan shall be unique to each residential dwelling or child-occupied facility and be developed prior to the abatement. The occupant protection plan shall describe the measures and management procedures that will be taken during the abatement.

A written occupant protection plan shall be developed for all abatement projects and shall be prepared according to the director of such activities according to the requirements of this paragraph. All written notifications must be delivered by United States Postal Service, fax, commercial delivery service, hand delivery, or by email on or before the applicable date. Instructions and sample forms can be obtained from the Utah Division of Air Quality Lead-Based Paint Program web site.

Lead-based paint abatement activities shall not begin on a date, or at a location other than that specified in either an original or updated notification, in the event of changes to the original notification; and

No firm or individual shall engage in lead-based paint abatement activities, as defined in R307-840-2, prior to notifying the director of such activities according to the requirements of this paragraph.

A written occupant protection plan shall be developed for all abatement projects and shall be prepared according to the following procedures:

(i) The occupant protection plan shall be unique to each residential dwelling or child-occupied facility and be developed prior to the abatement. The occupant protection plan shall describe the measures and management procedures that will be taken during the abatement to protect the building occupants from exposure to any lead-based paint hazards; and

(ii) A certified supervisor or project designer shall prepare the occupant protection plan.

(f) The work practices listed below shall be restricted during an abatement as follows:

(i) Open-flame burning or torching of lead-based paint is prohibited;

(ii) Machine sanding or grinding or abrasive blasting or sand blasting of lead-based paint is prohibited unless used with High Efficiency Particulate Air (HEPA) exhaust control which removes particles of 0.3 microns or larger from the air at 99.97% or greater efficiency;

(iii) Dry scraping of lead-based paint is permitted only in conjunction with heat guns or around electrical outlets or when treating defective paint spots totaling no more than 2 square feet in any one room, hallway, or stairwell or totaling no more than 20 square feet on exterior surfaces; and

(iv) Operating a heat gun on lead-based paint is permitted only at temperatures below 1100 degrees Fahrenheit.

(g) If conducted, soil abatement shall be conducted in one of the following ways:

(i) If the soil is removed:

(A) The soil shall be replaced by soil with a lead concentration as close to local background as practicable, but no greater than 400 ppm; and

(B) The soil that is removed shall not be used as top soil at another residential property or child-occupied facility; or

(ii) If soil is not removed, the soil shall be permanently covered, as defined in R307-840-2.

(h) The following post-abatement clearance procedures shall be performed only by a certified inspector or risk assessor:

(i) Following an abatement, a visual inspection shall be performed to determine if deteriorated painted surfaces and/or visible amounts of dust, debris, or residue are still present. If deteriorated painted surfaces or visible amounts of dust, debris, or residue are present, these conditions must be eliminated prior to the continuation of the clearance procedures;

(ii) Following the visual inspection and any post-abatement cleanup required by paragraph (5)(h)(i) of this section, clearance sampling for lead in dust shall be conducted. Clearance sampling may be conducted by employing single-surface sampling or composite sampling techniques;

(iii) Dust samples for clearance purposes shall be taken using documented methodologies that incorporate adequate quality control procedures;

(iv) Dust samples for clearance purposes shall be taken a minimum of 1 hour after completion of final post-abatement cleanup activities;

(v) The following post-abatement clearance activities shall be conducted as appropriate based upon the extent or manner of abatement activities conducted in or to the residential dwelling or child-occupied facility:

(A) After conducting an abatement with containment between abated and unabated areas, one dust sample shall be taken from one interior window sill and from one window trough (if present) and one dust sample shall be taken from the floors of each of no less than four rooms, hallways, or stairwells within the containment area. In addition, one dust sample shall be taken from the floor outside the containment area. If there are less than four rooms, hallways, or stairwells within the containment area, then all rooms, hallways, or stairwells shall be sampled;
(B) After conducting an abatement with no containment, two dust samples shall be taken from each of no less than four rooms, hallways, or stairwells in the residential dwelling or child-occupied facility. One dust sample shall be taken from one interior window sill and window trough (if present) and one dust sample shall be taken from the floor of each room, hallway, or stairwell selected. If there are less than four rooms, hallways, or stairwells within the residential dwelling or child-occupied facility, then all rooms, hallways, or stairwells shall be sampled; and

(C) Following an exterior paint abatement, a visible inspection shall be conducted. All horizontal surfaces in the outdoor living area closest to the abated surface shall be found to be cleaned of visible dust and debris. In addition, a visual inspection shall be conducted to determine the presence of paint chips on the dripline or next to the foundation below any exterior surface abated. If paint chips are present, they must be removed from the site and properly disposed of, according to all applicable federal, state, and local requirements;

(vi) The rooms, hallways, or stairwells selected for sampling shall be selected according to documented methodologies;

(vii) The certified inspector or risk assessor shall compare the residual lead level (as determined by the laboratory analysis) from each single surface dust sample with clearance levels in paragraph (5)(h)(viii) of this section for lead in dust on floors, interior window sills, and window troughs or from each composite dust sample with the applicable clearance levels for lead in dust on floors, interior window sills, and window troughs divided by half the number of subsamples in the composite sample. If the residual lead level in a single surface dust sample equals or exceeds the applicable clearance level or if the residual lead level in a composite dust sample equals or exceeds the applicable clearance level divided by half the number of subsamples in the composite sample, the components represented by the failed sample shall be re-cleaned and retested; and

(viii) The clearance levels for lead in dust are 40 ug/ft² for floors, 250 ug/ft² for interior window sills, and 400 ug/ft² for window troughs.

(i) In a multi-family dwelling with similarly constructed and maintained residential dwellings, random sampling for the purposes of clearance may be conducted provided:

(ii) A sufficient number of residential dwellings are selected for dust sampling to provide a 95% level of confidence that no more than 5% or 50 of the residential dwellings (whichever is smaller) in the randomly sampled population exceed the appropriate clearance levels; and

(iii) The randomly selected residential dwellings shall be sampled and evaluated for clearance according to the procedures found in paragraph (5)(h) of this section.

(j) An abatement report shall be prepared by a certified supervisor or project designer no later than 30 business days after receiving the results of final clearance testing and all soil analyses (if applicable). The abatement report shall include the following information:

(i) Start and completion dates of abatement;

(ii) The name and address of each certified firm conducting the abatement and the name of each supervisor assigned to the abatement project;

(iii) The occupant protection plan prepared pursuant to paragraph (5)(e) of this section;

(iv) The name, address, and signature of each certified risk assessor or inspector conducting clearance sampling and the date of clearance testing;

(v) The results of clearance testing and all soil analyses (if applicable) and the name of each recognized laboratory that conducted the analyses; and

(vi) A detailed written description of the abatement, including abatement methods used, locations of rooms and/or components where abatement occurred, reason for selecting particular abatement methods for each component, and any suggested monitoring of encapsulants or enclosures.

(6) Collection and laboratory analysis of samples. Any paint chip, dust, or soil samples collected pursuant to the work practice standards contained in this section shall be:

(a) Collected by persons certified by the director as an inspector or risk assessor; and

(b) Analyzed by a laboratory recognized by EPA pursuant to Section 405(b) of TSCA as being capable of performing analyses for lead compounds in paint chip, dust, and soil samples.

(7) Composite dust sampling. Composite dust sampling may only be conducted in the situations specified in paragraphs (3) through (5) of this section. If such sampling is conducted, the following conditions shall apply:

(a) Composite dust samples shall consist of at least two subsamples;

(b) Every component that is being tested shall be included in the sampling; and

(c) Composite dust samples shall not consist of subsamples from more than one type of component.

(8) Determinations.

(a) Lead-based paint is present:

(i) On any surface that is tested and found to contain lead equal to or in excess of 1.0 milligrams per square centimeter or equal to or in excess of 0.5% by weight; and

(ii) On any surface like a surface tested in the same room equivalent that has a similar painting history and that is found to be
lead-based paint.

(b) A paint-lead hazard is present:
   (i) On any friction surface that is subject to abrasion and where the lead dust levels on the nearest horizontal surface underneath the friction surface (e.g., the window sill or floor) are equal to or greater than the dust hazard levels identified in the definition of "Dust-lead hazard" in R307-840-2;
   (ii) On any chewable lead-based paint surface on which there is evidence of teeth marks;
   (iii) Where there is any damaged or otherwise deteriorated lead-based paint on an impact surface that is caused by impact from a related building component (such as a door knob that knocks into a wall or a door that knocks against its door frame); and
   (iv) If there is any other deteriorated lead-based paint in any residential building or child-occupied facility or on the exterior of any residential building or child-occupied facility.

(c) A dust-lead hazard is present in a residential dwelling or child-occupied facility:
   (i) In a residential dwelling on floors and interior window sills when the weighted arithmetic mean lead loading for all single surface or composite samples of floors and interior window sills are equal to or greater than 40 ug/ft² for floors and 250 ug/ft² for interior window sills, respectively;
   (ii) On floors or interior window sills in a building window sill in a multi-family dwelling, if a dust-lead hazard is present on floors or interior window sills, respectively, in at least one sampled residential unit on the property; and
   (iii) On floors or interior window sills in a building window sill in a multi-family dwelling, if a dust-lead hazard is present on floors or interior window sills, respectively, in at least one sampled common area in the same common area group on the property.

(d) A soil-lead hazard is present:
   (i) In a play area when the soil-lead concentration from a composite play area sample of bare soil is equal to or greater than 400 parts per million; or
   (ii) In the rest of the yard when the arithmetic mean lead concentration from a composite sample (or arithmetic mean of composite samples) of bare soil from the rest of the yard (i.e., non-play areas) for each residential building on a property is equal to or greater than 1,200 parts per million.

(9) Recordkeeping. All reports or plans required in this section shall be maintained by the certified firm or individual who prepared the report for no fewer than 3 years. The certified firm or individual also shall provide copies of these reports to the building owner who contracted for its services.

R307-842-4. Lead-Based Paint Activities Requirements.

Lead-based paint activities, as defined in R307-840-2, shall only be conducted according to the procedures and work practice standards contained in R307-842-3 of this rule. No individual or firm may offer to perform or perform any lead-based paint activity as defined in R307-840-2, unless certified to perform that activity according to the procedures in R307-842-2.

R307-842-5. Work Practice Requirements for Lead-Based Paint Hazards.

Applicable certification, occupant protection, and clearance requirements and work practice standards are found in R307-842 and in regulations issued by HUD at 24 CFR Part 35, Subpart R. The work practice standards in those regulations do not apply when treating paint-lead hazards of less than:
   (a) Two square feet of deteriorated lead-based paint per room or equivalent,
   (b) Twenty square feet of deteriorated paint on the exterior building, or
   (c) Ten percent of the total surface area of deteriorated paint on an interior or exterior type of component with a small surface area.

KEY: paint, lead-based paint, lead-based paint abatement
Date of Enactment or Last Substantive Amendment: May 9, 2017
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(i)
ITEM 7
Air Toxics
MEMORANDUM

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: November 12, 2019

SUBJECT: Air Toxics, Lead-Based Paint, and Asbestos (ATLAS) Section Compliance Activities – October 2019

Asbestos Demolition/Renovation NESHAP Inspections  
Asbestos AHERA Inspections  
Asbestos State Rules Only Inspections  
Asbestos Notification Forms Accepted  
Asbestos Telephone Calls  
Asbestos Individuals Certifications Approved  
Asbestos Company Certifications/Re-Certifications  
Asbestos Alternate Work Practices Approved/Disapproved  
Lead-Based Paint (LBP) Inspections  
LBP Notification Forms Approved  
LBP Telephone Calls  
LBP Letters Prepared and Mailed  
LBP Courses Reviewed/Approved  
LBP Course Audits  
LBP Individual Certifications Approved  

DAQA-852-19
LBP Firm Certifications        6
Notices of Violation Sent      1
Compliance Advisories Sent     14
Warning Letters Sent           11
Settlement Agreements Finalized 0

Penalties Agreed to:
Compliance
MEMORANDUM

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: November 21, 2019

SUBJECT: Compliance Activities – October 2019

_____________________________________________________________________________________

Annual Inspections Conducted:

Major ........................................................................................................................................ 4
Synthetic Minor .................................................................................................................. 1
Minor .................................................................................................................................. 30

On-Site Stack Test Audits Conducted: .................................................................................. 4

Stack Test Report Reviews: .................................................................................................... 62

On-Site CEM Audits Conducted: ............................................................................................ 0

Emission Reports Reviewed: .................................................................................................. 7

Temporary Relocation Requests Reviewed & Approved: ...................................................... 7

Fugitive Dust Control Plans Reviewed & Accepted: .............................................................. 187

Open Burn Permit Applications Completed: ................................................................. 0

Soil Remediation Report Reviews: ...................................................................................... 0

Miscellaneous Inspections Conducted: ................................................................................ 18

Complaints Received: ........................................................................................................... 16
Breakdown Reports Received: ................................................................. 0
Compliance Actions Resulting From a Breakdown: ................................................................. 0
Warning Letters Issued: ................................................................................................. 1
Notices of Violation Issued: .......................................................................................... 0

Unresolved Notices of Violation:

- Geneva Rock Products ........................................ 10/20/2017
- Mel Clark Construction ...................................... 01/11/2019
- Sunroc ......................................................... 02/28/2019
- University of Utah .............................................. 07/18/2019

Attorney General Office:

- Compass Minerals ................................................. 12/10/2018
- Gordon Creek Compressor Station ......................... 05/16/2018
- JRJ Services .......................................................... 06/21/2018
- JRJ Services .......................................................... 09/07/2018
- Norbest ............................................................. 11/15/2017
- Pacific Energy & Mining ......................................... 03/02/2018
- US Magnesium .................................................... 01/08/2019
- US Magnesium .................................................... 03/02/2018
- US Magnesium .................................................... 08/27/2015
- Strang Excavating ................................................. 01/17/2018

Compliance Advisories Issued: ................................................................. 1
No Further Action Letters Issued ................................................................. 1

Settlement Agreements Reached: ............................................................. 1
- Paradox Midstream - Lisbon .............................................. $9,600.00

1Miscellaneous inspections include, e.g., surveillance, level I inspections, VOC inspections, complaints, on-site training, dust patrol, smoke patrol, open burning, etc.
Air Monitoring
Utah 24-Hr PM2.5 Data  September 2019

Exceedence Value is 35 ug/m³
Utah 24-Hr PM2.5 Data  October 2019

Exceedence Value is 35 ug/m³

Utah Division of Air Quality
Utah Division of Air Quality

Utah 24-Hr PM2.5 Data  November 2019

Exceedence Value is 35 ug/m³
Utah 24-hr PM$_{10}$ Data  September 2019

Exceedance Value is 150 ug/m$^3$
Utah Division of Air Quality

Utah 24-hr PM$_{10}$ Data  October 2019

Exceedance Value is 150 ug/m$^3$

PM$_{10}$ (ug/m$^3$)

Days

Utah Tech Center

24-hr Exceedance Value is 150 ug/m$^3$
Highest 8-hr Ozone Concentration & Daily Maximum Temperature  November 2019

Ozone (ppm)

Daily Maximum Temperature (°C) (Roosevelt)

Days

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

7.0 10.1 13.2 13.7 13.2 14.6 13.2 12.9 12.9 12.5 15.8 13.8 13.8 11.9 10.6 10.7 10.6 11.9 10.4 8.3 10.4 12.9 13.2 13.2 13.4 12.3 13.2 13.2 10.4 7.0 5.1

-10.0 -5.0 0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0

0.000 0.010 0.020 0.030 0.040 0.050 0.060 0.070 0.080

Price #2 Roosevelt Vernal #4 Exceed. TM
Highest 8-hr Ozone Concentration & Daily Maximum Temperature  November 2019

- **Ozone (ppm)**
- **Daily Maximum Temperature (°C) [Smithfield]**

Days | Ozone (ppm) | Daily Maximum Temperature
--- | --- | ---
1   | 8.2    | 16.0
2   | 10.1   | 17.4
3   | 12.4   | 16.0
4   | 15.4   | 15.2
5   | 16.6   | 18.1
6   | 17.4   | 11.9
7   | 16.0   | 11.0
8   | 15.4   | 13.3
9   | 16.6   | 12.3
10  | 17.4   | 12.2
11  | 16.6   | 14.7
12  | 17.4   | 16.4
13  | 16.0   | 12.2
14  | 15.4   | 16.0
15  | 16.0   | 15.2
16  | 18.1   | 13.3
17  | 15.4   | 12.3
18  | 16.6   | 14.7
19  | 17.4   | 16.4
20  | 16.6   | 12.2
21  | 17.4   | 14.7
22  | 16.6   | 16.4
23  | 17.4   | 12.2
24  | 16.6   | 14.7
25  | 17.4   | 16.4
26  | 16.6   | 12.2
27  | 17.4   | 14.7
28  | 16.6   | 16.4
29  | 17.4   | 12.2
30  | 16.6   | 14.7

Note: Days 1-30 correspond to November 2019.
Highest 8-hr Ozone Concentration & Daily Maximum Temperature  November 2019

Ozone (ppm) vs. Daily Maximum Temperature (°C) (Lindon)

Days

10.8 12.6 13.3 14.1 15.2 14.5 12.6 12.3 13.4 13.2 12.6 12.6 18.2

6.2 11.2 12.6 13.4 13.2 12.6 10.9 11.2 12.3 12.6 12.3 12.6 18.2

Daily Maximum Temperature (°C) (Lindon)

Ozone (ppm)

Days

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Highest 8-hr Ozone Concentration & Daily Maximum Temperature  November 2019

Days

Daily Maximum Temperature (°C) (Hurricane)

Ozone (ppm)

19.8 21.2 21.5 21.2 20.2 20.0 21.8 21.7 21.2 19.7 20.4

16.8 20.5 21.2 21.2 20.8 19.1 19.0 19.0 19.7 20.4

0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Enoch
Escalante
Hurricane
Exceed.
TM