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Response to Public Comments Regarding the 2020 Air Monitoring Network Plan

Responses

DAQ greatly appreciates the thoughtful and well-reasoned recommendations by the Utah Petroleum Association (UPA) regarding DAQ's 2020 Air Monitoring Network Plan. DAQ is committed to maintaining an Air Monitoring Network that best supports developing economically efficient and effective regulations that will bring (or keep) Utah in attainment of federal pollution standards. As such, DAQ has carefully considered each of the UPA's recommendations.

Comment:

Recommendation: Add co-located PM_{2.5} monitors to the Near Road, Copperview, Herriman #3, and Saltair sites and include a co-located PM_{2.5} monitor at the second near road site, at the time of initial installation.

Current status: The Copperview, Herriman #3, Near Road (NR), and Saltair sites each have a primary PM_{2.5} monitor of continuous monitoring design with no co-located monitor.

Justification: In prior years, inconsistent performance of primary PM_{2.5} monitors resulted in less than a full data-set for 24-hour PM_{2.5} measurements at some monitor locations, and, as a result, the 98th percentile values for determining the monitor design values dropped from the 8th high to as low as the 4th or 5th high. This in turn resulted in calculating artificially high design values, putting even more strain on the pursuit of attainment for the Salt Lake City PM_{2.5} nonattainment area. While the continuous monitors located at these sites perform more reliably than the Federal Reference Method (FRM) monitors with filter papers requiring before/after weighing, and while UDAQ has enhanced their consistency of operating PM_{2.5} monitors, having a single monitor at a location with no co-located monitor poses an untenable and unacceptable risk to the attainment status of the area and the associated requirements for added costly emissions controls under the Clean Air Act.

This is most important at the Near Road monitor, which had the highest 98th percentile value of all PM_{2.5} monitors in Salt Lake County in 2019, with a value of 31.0 µg/m³ compared to the next highest 98th percentile value, at the Copperview monitor which has a 2019 value of 28.7 µg/m³, more than 2 µg/m³ lower than the Near Road monitor. It may be equally important at the second Near Road monitor, to be added, considering that these near road monitors are intended by design to measure the highest ambient PM_{2.5} concentrations.

Despite the improved performance and more reliable monitor operation, many things can still go wrong with a delicate monitor that would threaten the 8th high as 98th percentile, such as the

monitor that incurred vandalism damage early this year. Co-located monitors at every PM_{2.5} monitoring location reduce this risk.

DAQ Response –

Hawthorne and Rose Park (and likely, the Tech Center) consistently record the highest PM_{2.5} concentrations in the airshed. UDAQ's data completeness is improving. Quality assurance and quality control (QA/QC) measures have improved with greater efficiency and less instrument downtime. DAQ will continue to improve its QA/QC efforts. The comment also points out an error in a chart on page 8 that Saltair has a PM_{2.5} monitor. It does not, as it is a Met-only site and the chart has been corrected. As the commenter points out, co-located monitors are in place at other sites that are the controlling monitors for Salt Lake County and the network meets all co-location requirements. Additional monitors would require additional resources that are not available at this time. The NR site may or may not show higher values, thus far the operations of the monitors have been concurrent with adjacent road construction on I-15. We are watching closely the values that the monitors report now that construction has been completed.

Comment:

Recommendation: Increase PM_{2.5} speciation at the Hawthorne and Bountiful monitoring sites to daily.

Current status: Speciation occurs at the Hawthorne monitor 1 in every 3 days. Speciation occurs at the Bountiful monitor 1 in every 6 days.

Justification for recommendation: High PM_{2.5} concentrations may occur on any day, at any time of the year, due to both the normal wintertime cold pool episodes plus exceptional events such as wildfires, high winds, and fireworks. Daily speciation would ensure availability of speciation data on any date of concern and thus provide supporting evidence for exceptional events. In addition, should the Salt Lake City PM_{2.5} nonattainment area fail to be redesignated to attainment or if a future lowered PM_{2.5} standard puts the area in nonattainment again, more consistent and reliably obtained speciation data during wintertime cold pool episodes will provide valuable information to support modeling and attainment planning. For example, with the 1/3 speciation at Hawthorne, ammonium chloride cannot be readily and consistently matched to area chloride releases to ascertain the effect of chloride emissions on PM_{2.5}. As emissions of direct PM_{2.5} and other PM_{2.5} precursors (NO_x, SO_x, VOC, and ammonia) ratchet down, understanding the chloride contribution to air quality becomes increasingly important to be able to make further gains in air quality.

DAQ Response

During the last winter, DAQ did run daily speciated PM_{2.5} monitoring at Hawthorne and is currently evaluating the efficacy of such a monitoring schedule. The value of the data will be compared to the resources required to collect it. DAQ is discussing running daily wintertime speciation at Hawthorne on a triannual basis. It is unlikely that PM_{2.5} composition will change year-to-year, so a triannual schedule could be effective in determining if Salt Lake County's PM_{2.5} composition is changing. It's unlikely we would experience exceptional event contributions, such as from dust storms or wildfires, to the Salt Lake Valley during a wintertime persistent cold air pool (i.e., inversion) period when wind speeds are quite low. Current speciation is conducted as

part of the Chemical Speciation Network (CSN) and is funded by EPA. Increasing the frequency of speciation would require increased resources that the DAQ does not have available at this time.

Comment:

Recommendation: Add a new PM_{2.5} speciation site in the western part of the Salt Lake City PM_{2.5} nonattainment area. Salt Lake County has only one PM_{2.5} speciation site, at Hawthorne.

Justification: Photochemical modeling to-date has not replicated ammonium chloride PM_{2.5} formation at the Hawthorne site, nor has it replicated measured chlorine concentrations in the eastern portion of the County. Various studies including the most recent one, WaFACO2 study, point to the large point source west of Salt Lake County as the source of chlorides. Adding a speciation site in the western portion of the County will aid in understanding the contribution of ammonium chloride to ambient PM_{2.5} and the contribution to ambient chlorides from the point source and will also provide additional information valuable towards enhancing model performance with respect to ammonium chloride formation.

DAQ Response:

The lack of modeled particulate ammonium chloride (pNH₄Cl) could be due to either a lack of ammonium chloride precursors (e.g., hydrochloric acid, chlorine gas, other halogen species) in the emissions inventory or a lack of westerly transport in the model. It is not clear that more monitoring, by itself, would help resolve the low bias in modeled ammonium chloride. DAQ was able to model significant plumes of pNH₄Cl west of the nonattainment region (the location referenced in the recommendation). However, the pNH₄Cl didn't move eastward into Salt Lake City at any time during the duration of the modeled episode. Therefore, it's unclear if westerly transport was simulated poorly or if yet-unknown local sources of pNH₄Cl precursors were responsible.

DAQ is still examining results from the WaFACO study. DAQ recently funded a NOAA research project led by WaFACO principal investigator, Dr. Steve Brown. The goal of the project is to help us better understand the role of halogen sources in wintertime pollution along the Wasatch Front. The results of this state-funded project will be made publicly available after the project's completed. DAQ desires to improve model performance for pNH₄Cl.

DAQ will enquire of EPA if resources are available to add another CSN site to the western side of Salt Lake County.

Comment:

Recommendation: Add at least one more Photochemical Assessment Monitoring Station (PAMS) monitor for Volatile Organic Compound (VOC) monitoring in the Northern Wasatch Front ozone nonattainment area.

Current status: The Northern Wasatch Front ozone nonattainment area has two PAMS monitors, one at the Hawthorne monitoring site in Salt Lake County which serves as the required National Core multipollutant monitoring station (NCore), and one at Bountiful in Davis County.

Justification: With the newly designated Northern Wasatch Front ozone nonattainment areas, UDAQ may be required to develop a photochemical ozone model for the area and use it to determine appropriate controls to achieve attainment. The two PAMS monitors provide valuable information to tune the model but may not provide enough information regarding how VOC concentrations vary across the nonattainment area and especially about how they vary across the most populous county, Salt Lake. Research in the Uintah Basin has shown that VOC concentrations and constituent profiles vary widely across the Basin and influence model performance. Similar information in the Wasatch Front will be valuable towards ozone attainment planning efforts. Furthermore, even in the absence of ozone attainment planning, better information about the variability of VOCs across the Wasatch Front will be valuable towards understanding air quality and to identifying cost-effective ways to enhance air quality.

DAQ Response

A large component of operating a PAMS site requires running a Gas Chromatograph (GC). A GC is used to simultaneously measure a multitude of volatile organic compound (VOC) species, which is important because different VOC's are not equally reactive. In other words, certain VOC species (e.g., carbonyls, BTEX) contribute to ozone formation more than others (e.g., propane).

However, it must be stated that operating a GC is both expensive and labor-intensive. The EPA has not provided DAQ any operational PAMS funding for the existing PAMS site and will not in the foreseeable future. Even if DAQ were to acquire more funding for one additional PAMS site, it would be required to establish an enhanced monitoring site in the Uintah Basin. Although DAQ has recently funded VOC composition studies in the Uinta Basin, there is a lack of reliable continuous VOC data in that region. Additional PAMS sites along the Wasatch front would require considerable resources that DAQ does not have available at this time.

Comment:

Add one or more additional Mix Layer Height instrument to a monitor location within the Northern Wasatch Front ozone nonattainment area.

Current status: The Hawthorne NCore monitoring site in the Northern Wasatch Front ozone nonattainment area has a mix layer height instrument. Additionally, the Lindon monitoring site in the Southern Wasatch Front ozone nonattainment area has a mix layer height instrument.

Justification: Demonstrating ozone and PM_{2.5} exceptional events due to wildfires remains an important tool for managing policy relevant NAAQS decisions and ensuring that Utah does not find itself in the problematic situation of needing to try to control ozone outside of its ability to control, such as that caused by distant wildfires. Mix layer height instruments provide important information towards demonstrating that wildfire smoke from distant states that traveled over Utah has mixed down to ground level and therefore could be valuable towards demonstrating exceptional events.

DAQ Response:

As the commentator stated, one ceilometer must be stationed at Hawthorne due to PAMS requirements at the NCOR site. However, there is no federal requirement as to where to place other DAQ ceilometer instruments or to have any additional ceilometers. As such, DAQ will

discuss the recommendation and determine if placing an additional ceilometer in the Northern Wasatch Front ozone nonattainment region would be beneficial. It is unclear how multiple instruments in relatively close proximity would provide added benefit. As with any additional instruments, these would require scarce resources that may not be available at this time or in the future.