

# State of Colorado

## Enhanced Monitoring Plan for Ozone

Colorado Department of Public Health and Environment  
Air Pollution Control Division

APCD-TS-B1

4300 Cherry Creek Drive South

Denver, Colorado

80246-1530

October 1, 2019



**COLORADO**  
Department of Public  
Health & Environment

## Introduction

The United States Environmental Protection Agency (EPA) promulgated a revision to the National Ambient Air Quality Standard for ozone on October 26, 2015. These revisions also included new requirements for Photochemical Assessment Monitoring Stations (PAMS). One requirement was that, “State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures” (40 CFR 58, Appendix D (5)(a)). The Denver Metropolitan area meets this population requirement and a PAMS site was proposed, with a waiver, to be located at the existing Rocky Flats-North site (08-059-0006). This proposal was noticed in the 2017 Colorado Annual Monitoring Network Plan, submitted to the EPA on June 30, 2017, and EPA approval was received on January 17, 2018.

The ozone revision also required, “States with Moderate and above 8-hour O<sub>3</sub> nonattainment areas and states in the Ozone Transport Region as defined in 40 CFR 51.900 shall develop and implement an Enhanced Monitoring Plan (EMP) detailing enhanced O<sub>3</sub> and O<sub>3</sub> precursor monitoring activities to be performed” (40 CFR 58, Appendix D (5)(h)). The Colorado North Front Range Nonattainment Area is currently designated as “moderate” and is in the process of being bumped up to a “serious” designation. This plan is to be submitted to the EPA Regional Administrator no later than October 1, 2019 or two years following the effective date of a designation to a classification of Moderate or above ozone nonattainment, whichever is later. At a minimum, the EMP shall be reassessed and approved as part of the 5-year network assessments as required under 40 CFR 58.10(d). The EMP will include monitoring activities deemed important to understanding the ozone problems in the state. For Colorado, these activities fall into four general categories:

1. Additional ozone monitors beyond those that are required in 40 CFR Part 58 Appendix D, Section 4.1;
2. Additional NO<sub>x</sub> or NO<sub>y</sub> monitors beyond those that are required in 40 CFR Part 58 Appendix D, Section 4.3;
3. Additional speciated volatile organic compounds (VOC) measurements including data gathered during different periods other than those required under 40 CFR Part 58 Appendix D, Section 5(g), or locations other than those required under 40 CFR Part 58 Appendix D, Section 5(a); and
4. Enhanced upper air measurements of meteorology or pollution concentrations.

This EMP was put out for a 30-day public comment period on August 22, 2019, and closed on September 23, 2019.

## Enhanced Monitoring Plan

### *1. Additional ozone monitoring beyond the minimally required*

The Colorado North Front Range is comprised of four metropolitan statistical areas, with a minimum of five required ozone monitoring locations, per 40 CFR Part 58, Appendix D, Section 4.1. Currently the Colorado Department of Public Health and Environment (CDPHE) operates 16 ozone monitoring locations in the Colorado North Front Range Nonattainment Area, resulting in an additional 11 stations beyond what is minimally required by the EPA. These additional stations help support the basic monitoring objectives of public data reporting, air quality mapping, air quality modeling, air quality forecasting, and an understanding of ozone photochemistry. The CDPHE will continue to support these additional stations as part of this EMP and will make adjustments to the network to further align with CDPHE'S air quality monitoring goals and objectives as defined in CDPHE'S 5-year Network Assessment.

Currently, planned adjustments to the ozone network include the possible commissioning of two other stations, one in the North Front Range foothills in Evergreen and another in the Denver-Julesburg oil and gas development area in Weld County. Also planned is the decommissioning of the Aspen Park and Welch stations. The decommissioning of these stations are due to their relocation to Black Hawk and Evergreen, respectively. In addition to these regulatory type ozone monitoring stations, the CDPHE also plans to deploy a small network of solar powered ozone analyzer systems (2B Tech 205) for short term special purpose air monitoring studies in support of efforts to further understand or define ozone formation in and/or near the Colorado North Front Range Nonattainment Area. Locations for these short term studies have yet to be defined but will be determined on an as needed basis annually. The CDPHE will also support other governmental organizations and researchers, to the extent possible, in their collection of quality ozone data that could be used in further understanding Colorado's ozone problem.

Table 1 shows a list of all current North Front Range ozone monitoring stations and a list of proposed ozone monitoring stations that may be implemented under this plan.

### *2. Additional oxides of nitrogen monitoring beyond the minimally required*

Per 40 CFR Part 58 Appendix D, Section 4.3, the Colorado North Front Range Nonattainment Area is required to operate five nitrogen dioxide (NO<sub>2</sub>) monitoring stations. These include two near-road monitoring stations (Section 4.3.2), one PAMS true NO<sub>2</sub> monitoring station (Section 5(b)(4)), one area-wide monitoring station (Section 4.3.3), and one Regional Administration monitoring station in support of EPA's national effort to expand monitoring protections of susceptible and vulnerable populations (Section 4.3.4). Currently the CDPHE operates six NO<sub>2</sub> analyzers in the North Front Range area, two of which are true NO<sub>2</sub> analyzers that are run tandem with NO<sub>y</sub> analyzers. These six analyzers meet and exceed the minimum monitoring requirements for regulatory monitoring. The CDPHE will continue to

support these stations/analyzers as part of this EMP and will make adjustments to the network to further align with CDPHE'S air quality monitoring goals and objectives as defined in CDPHE's 5-year Network Assessment.

Despite the decreased relevance of NO<sub>2</sub> as an ambient air pollutant, the CDPHE feels that the monitoring network should be expanded due to the importance of NO<sub>2</sub> as an ozone precursor. Specifically, the CDPHE recognizes the need for new NO<sub>2</sub> monitoring in the Denver-Julesburg oil and gas development area. It is CDPHE's intent to centrally locate a station within the Denver-Julesburg Basin in Weld County to provide an estimate of NO<sub>2</sub> within the basin. In addition to these regulatory type NO<sub>2</sub> monitoring stations, the CDPHE also has a 2BTech 405 NO/NO<sub>2</sub>/NO<sub>x</sub> monitor that can be used for short term special purpose air monitoring studies in support of efforts to further understand or define NO<sub>2</sub> emissions and/or photochemistry in or near the Colorado North Front Range Nonattainment Area. These short term studies have yet to be defined but will be determined on an as needed basis annually. The CDPHE will also support other governmental organizations and researchers, to the extent possible, in their collection of quality NO<sub>2</sub> data that could be used in further understanding Colorado's ozone problem.

Table 2 shows a list of all current North Front Range nitrogen dioxide monitoring stations and a list of proposed NO<sub>2</sub> monitoring stations that may be implemented under this plan.

### *3. Additional VOC monitoring beyond the minimally required*

Included in EPA's revision to the 2015 Ozone NAAQS is a redesign of the PAMS network. Specifically, this redesign required state and local air monitoring agencies to collect and report PAMS measurements at each NCore station in CBSAs with a population of 1,000,000 or more based on the latest available census data (40 CFR Part 58 Appendix D (5)(a)). Included in the rule was a waiver option to relocate the PAMS station to an alternative location other than the NCore station. Colorado's Denver-Boulder CBSA has a population in excess of 1,000,000 and is thus required to install a PAMS monitoring station. A waiver request was made in Colorado's 2017 Annual Monitoring Network Plan to locate its PAMS monitoring station at the Rocky Flats North (08-059-0006) monitoring site instead of the NCore monitoring site (La Casa, 08-031-0026). This waiver request was granted by EPA on January 17, 2018. This station was to be operational by June 1, 2019. The CDPHE has yet to begin full PAMS monitoring due to limited funding and staffing resources. Because of support limitations, the EPA has proposed an extension of the implementation date. It is anticipated that a two year implementation date extension will be promulgated in the CFR by the end of 2019. The CDPHE will implement PAMS monitoring once EPA provides the resources necessary to procure supplies and operate the station. Hourly averaged speciated VOC measurements are required at all PAMS locations as well as carbonyls, ozone, NO/NO<sub>2</sub>/NO<sub>x</sub>/NO<sub>y</sub>, meteorology and mixing height.

In addition to PAMS VOC monitoring, the CDPHE operates two other VOC monitoring stations. One station is located at CDPHE's Platteville station and the other is at the downtown

Denver CAMP station. The Platteville station (08-123-0008) was selected due to its central location in the Denver-Julesburg oil and gas development area, and as an existing CDPHE monitoring location. The Denver CAMP station (08-031-0002) was selected due to its proximity to motor vehicle and other urban sources, and as an existing CDPHE monitoring location. These stations operate on a 1/6 day schedule where ambient air samples are collected via Summa canisters from 6:00 am to 9:00 am in the morning and are analyzed for the PAMS compound list. It is CDPHE's intent to continue operations of these stations as part of this EMP.

In addition to these existing VOC monitoring stations, the CDPHE recognizes the need for additional VOC monitoring in the Denver-Julesburg oil and gas development area to support photochemical modeling, current emissions inventories and the evaluation of VOC trends. Two additional VOC monitoring stations that would also use Summa canisters are under investigation, one in the northern part of the basin near Greeley, and the other in the southern part of the basin west of Brighton. The CDPHE will also support other governmental organizations and researchers, to the extent possible, in their collection of quality VOC data that could be used in further understanding Colorado's ozone problem.

Table 3 shows a list of all current North Front Range VOC monitoring stations and a list of proposed VOC monitoring stations that may be implemented under this plan.

#### *4. Additional meteorological monitoring beyond the minimally required*

Per 40 CFR Part 58 Appendix D, Section 3(b) and Section 5(a), the Colorado North Front Range Nonattainment Area is required to operate two meteorological monitoring stations. One at Colorado's NCore station (La Casa) and the other at Colorado's PAMS station (Rocky Flats North). Currently the CDPHE operates 15 meteorological stations in the North Front Range area, resulting in an additional 13 stations beyond what is minimally required by the EPA. The CDPHE will continue to support all of these stations as part of this EMP and will make adjustments as necessary to the network to further align with CDPHE'S air quality monitoring goals and objectives as defined in CDPHE's 5-year Network Assessment.

Two of CDPHE's 15 meteorological stations are tentatively scheduled to be closed and relocated. These two stations are Aspen Park and Welch. The Aspen Park meteorological tower and sensors will be relocated to the Black Hawk station and the Welch tower and sensors will be relocated to the planned Evergreen station. The CDPHE is also planning on installing a meteorological tower and sensors at the Fort Collins-West ozone site. In addition to these relocations and addition, the CDPHE is tentatively planning on installing an air monitoring station in the central Denver-Julesburg oil and gas development area that will also include a meteorological tower and sensors. The development of this station is pending the identification of viable location.

Table 4 shows a list of all current North Front Range meteorological monitoring stations and a list of proposed meteorological monitoring stations that may be implemented under this plan.

Table 1: North Front Range Ozone Monitoring Stations

Monitor Count	AQS ID	Station Name	County
1	08-001-3001	Welby	Adams
2	08-005-0002	Highlands	Arapahoe
3	08-005-0006	Aurora East	Arapahoe
4	08-013-0014	Boulder Reservoir	Boulder
5	08-019-0006	Mines Peak *	Clear Creek
6	08-031-0002	CAMP	Denver
7	08-031-0026	La Casa (NCore)	Denver
8	08-035-0004	Chatfield	Douglas
9	08-047-0003	Black Hawk	Gilpin
10	08-059-0005	Welch (to be closed)	Jefferson
11	08-059-0006	Rocky Flats North (PAMS)	Jefferson
12	08-059-0011	NREL	Jefferson
13	08-059-0013	Aspen Park (to be closed)	Jefferson
14	08-069-0011	Fort Collins - West	Larimer
15	08-069-1004	Fort Collins - CSU/Mason	Larimer
16	08-123-0009	Weld County Tower	Weld
<b>Proposed Enhanced Monitoring Plan Stations:</b>			
17	TBD	Front Range Foothills (Evergreen)	Jefferson
18	TBD	Central DJ Basin (Platteville area)	Weld
19	TBD	Special Studies in North Front Range	TBD

\* Mines Peak O<sub>3</sub> is only used for forecasting purposes and not for comparison to the NAAQS.

Table 2: North Front Range Oxides of Nitrogen Monitoring Stations

Monitor Count	AQS ID	Station Name	County	Parameters
1	08-001-3001	Welby (regional administrator site)	Adams	NO/NO <sub>2</sub> /NO <sub>x</sub>
2	08-031-0002	CAMP	Denver	NO/NO <sub>2</sub> /NO <sub>x</sub>
3	08-031-0026	La Casa (NCore)	Denver	NO/NO <sub>y</sub> -NO/ NO <sub>y</sub> /True NO <sub>2</sub> /NO <sub>x</sub>
4	08-031-0027	I-25 Denver (near road site)	Denver	NO/NO <sub>2</sub> /NO <sub>x</sub>
5	08-031-0028	I-25 Globeville (near road site)	Denver	NO/NO <sub>2</sub> /NO <sub>x</sub>
6	08-059-0006	Rocky Flats North (PAMS)	Jefferson	NO/NO <sub>y</sub> -NO/ NO <sub>y</sub> /True NO <sub>2</sub> /NO <sub>x</sub>
<b>Proposed Enhanced Monitoring Plan Stations:</b>				
7	TBD	Central DJ Basin (Platteville area)	Weld	NO/NO <sub>2</sub> /NO <sub>x</sub>
8	TBD	Special Studies	TBD	NO/NO <sub>2</sub> /NO <sub>x</sub>

Table 3: North Front Range VOC Monitoring Stations

Monitor Count	AQS ID	Station Name	County	Sample Type
1	08-031-0002	CAMP	Denver	VOC (Summa canisters)/ carbonyls (DNPH cartridges)
2	08-123-0008	Platteville Middle School	Weld	VOC (Summa canisters)/ carbonyls (DNPH cartridges)
3	08-059-0006	Rocky Flats North (PAMS)	Jefferson	VOC (AutoGC)/ carbonyls (DNPH cartridges)
Proposed Enhanced Monitoring Plan Stations:				
5	TBD	Northern DJ Basin (Greeley area)	Weld	VOC (Summa canisters)
6	TBD	Southern DJ Basin (west of Brighton)	Adams	VOC (Summa canisters)

Table 4: North Front Range Meteorological Monitoring Stations

Monitor Count	AQS ID	Station Name	County	Parameters
1	08-001-3001	Welby	Adams	WS/WD/Temp
2	08-005-0002	Highlands	Arapahoe	WS/WD/Temp
3	08-005-0006	Aurora East	Arapahoe	WS/WD/Temp
4	08-013-0014	Boulder Reservoir	Boulder	WS/WD/Temp/RH
5	08-031-0002	CAMP	Denver	WS/WD/Temp
6	08-031-0026	La Casa (NCore)	Denver	WS/WD/Temp/Temp Diff/ RH/Solar
7	08-031-0027	I-25 Denver	Denver	WS/WD/Temp
8	08-031-0028	I-25 Globeville	Denver	WS/WD/Temp/RH
9	08-035-0004	Chatfield	Douglas	WS/WD/Temp
10	08-059-0002	Arvada	Jefferson	WS/WD/Temp
11	08-059-0005	Welch (to be closed)	Jefferson	WS/WD/Temp
12	08-059-0006	Rocky Flats North (PAMS)	Jefferson	WS/WD/Temp/Temp Diff/RH/BP/Solar/ Precip/mixing height
13	08-059-0013	Aspen Park (to be closed)	Jefferson	WS/WD/Temp
14	08-069-1004	Fort Collins - CSU/Mason	Larimer	WS/WD/Temp
15	08-123-0009	Weld County Tower	Weld	WS/WD/Temp
Proposed Enhanced Monitoring Plan Stations:				
16	08-047-0003	Black Hawk	Gilpin	WS/WD/Temp
17	08-069-0011	Fort Collins - West	Larimer	WS/WD/Temp
18	TBD	Front Range Foothills (Evergreen)	Jefferson	WS/WD/Temp
19	TBD	Central DJ Basin (Platteville)	Weld	WS/WD/Temp

## **Appendix**

### **Public Comments and Responses**

This Enhanced Monitoring Plan was made available for public comment from August 22, 2019 through September 23, 2019. Three comments were received. These comments, and responses, are presented below in this Appendix.

## 1. Comment from Karen Artell, received 9/16/2019

9/17/2019

Air Pollution Control Division  
Colorado Department of Public Health and Environment  
APCD-TS-B1  
4300 Cherry Creek Drive South  
Denver Colorado  
80246

Thank you for the opportunity to comment on the State's Enhanced Monitoring Plan for Ozone.

I am a resident of Fort Collins and am concerned about the City's high ozone days during the summer months.

I fully support your plan for enhanced ozone, NO<sub>x</sub>, VOCs, and meteorological monitoring in the north front range area. The more air quality data we have, the better air quality policy and planning can be.

Fort Collins' air quality is affected by oil and gas emissions from Weld County to the east and southeast of the City. Future air quality will be affected by the north front range area's rapid population growth and resulting traffic emissions and oil and gas operations moving into the southeast portions of Larimer County and north of Fort Collins. Hotter summers and more western wild fires with resultant high ozone levels, seem to also be the norm that must be planned for.

In 2017, Lisa Kaser, Gabriele Pfister and Frank Flocke with the National Center for Atmospheric Research (NCAR) prepared an assessment of the City's ozone monitoring network using data from the 2014 [FRAPPE and Discover-AQ studies](#) and observational data. The final report can be found on the City's air quality web site. <https://www.fcgov.com/airquality/reports> Two of the assessment author's, Gabriele Pfister and Frank Flocke, provided an overview of their analysis and recommendations to concerned citizens and various Fort Collins and Larimer County Boards that can also be accessed from the City's web site.

I would like to see the authors' recommendations to the City be included in CDPHE's enhanced monitoring in the north front range area. Please see the authors' report for more detailed information. The following are my understanding of the recommendations:

- The addition of a meteorological sensor (this is included in CDPHE's plan) and NO<sub>x</sub> sensor at the West Fort Collins monitoring station
- Possibly move the Fort Collins CSU monitor but the authors noted that this would compromise the long-term record of this monitor. Alternatively, another monitor could be added in the City.
- The addition of a NO<sub>x</sub> sensor in the City, but not at the FC CSU site.
- An additional meteorological, ozone, NO<sub>x</sub> and VOV sensors in the southeast area of the City to measure emissions coming into the City from oil and gas operations to the east and southeast of the City and mobile emissions that will increase with the area's increasing population.

Thank you for your consideration.

Karen Artell

***APCD Response:***

Thank you for your comments. We agree, based on emissions inventories and modeling, that motor vehicles and oil and gas development are the two largest contributors to ozone formation in the North Front Range area. Moving the Fort Collins CSU station to a different location is an item that we have considered. However, the carbon monoxide monitor at that site is required until the carbon monoxide maintenance plan has been fulfilled and the area has been re-designated to attainment.

For ozone, we do conduct targeted ozone studies every year in areas that have never had monitoring, in areas that have significantly changed, or areas where we are looking to move or add monitoring. Northern Colorado is under consideration for summer next year and would provide information on more optimal monitoring locations. Based on monitoring for ozone in the North Front Range, it is not likely that a site in the southeast area of Fort Collins will be as high a concentration area due to the proximity of “fresh” NO<sub>x</sub> sources that will degrade ozone.

For NO<sub>x</sub>, existing monitoring in the Denver area provides a good indication of concentrations that are likely to occur in urban areas. It is noted that even at high-volume near-roadway sites in Denver, we do not have violations of the standards for NO<sub>2</sub>. However, as noted in our 2019 Ambient Air Monitoring Network Plan, additional NO<sub>2</sub> monitors may be installed in the North Front Range area as resources exist.

For VOC's, one of the main goals is determine concentrations in source areas prior to daytime reactions in sunlight taking place. These “precursor” measurements provide a good idea of what sources may need to be controlled to reduce ozone concentrations. Thus, for oil and gas development, we need to monitor more in that area. Motor vehicle sources are fairly well characterized by monitoring we perform in Downtown Denver and unfortunately, due to federal rules, we do not have the ability to put regulations on those emissions. As we have resources, we do plan on conducting limited VOC sampling at different locations in the North Front Range to get additional information.

## 2. Comment from City of Fort Collins, received 9/23/2019



Environmental Services  
222 Laporte Ave  
PO Box 580  
Fort Collins, CO 80522  
970-221-6600  
fcgov.com

September 23, 2019

Air Pollution Control Division  
4300 Cherry Creek Drive South  
Denver, Colorado  
80246-1530

**RE: City of Fort Collins comments regarding the State of Colorado Enhanced Monitoring Plan for Ozone**

To Whom It May Concern:

Thank you for this opportunity to provide comments regarding the State of Colorado Enhanced Monitoring Plan (EMP) for Ozone. The City of Fort Collins is part of the Denver Metro/North Front Range nonattainment area, which is expected to be downgraded from "moderate" to "serious" nonattainment status in December 2019.

In Fort Collins and the northern part of the nonattainment area, transport of VOC emissions from oil and gas operations northeast of the City have been demonstrated to show a stronger influence than mobile sources, while the area around Denver and the southern part of the nonattainment area is more influenced by mobile sources<sup>1</sup>. The City of Fort Collins appreciates the CDPHE's intent to support local governments and researchers in further understanding our ozone issues, and we offer the following recommendations to better characterize the northern part of the nonattainment area.

**Section 1. Additional ozone monitoring beyond the minimally required:**

The EMP indicates that an additional ozone monitoring station will be considered in the Denver-Julesburg oil and gas development area in Weld County. For this site, it is recommended that it be placed in an area that would best represent southeasterly flow of transported oil and gas emissions to the northern part of the nonattainment area (e.g., Windsor area).

Alternately (or additionally), an optimal location for enhanced ozone monitoring location within Fort Collins City limits might be in the southeast part of the City, in or near the Fossil Creek Reservoir Natural Area. This would represent transport into Fort Collins, and add a representative monitor, as the current ozone monitor in downtown Fort Collins is not ideally suited for monitoring ozone due to nearby "fresh" NO<sub>x</sub> emissions scavenging ozone.

**Section 2. Additional oxides of nitrogen monitoring beyond the minimally required:**

Currently, there are no NO<sub>x</sub> monitors in the northern part of the nonattainment area. Pairing NO<sub>x</sub> measurements with one or both of the Fort Collins ozone monitors is recommended due to the importance of NO<sub>2</sub> as an ozone precursor. In Fort Collins, unlike the Denver area, analysis by the National Center for Atmospheric Research (NCAR)<sup>2</sup> indicated an ongoing shift toward a more NO<sub>x</sub> limited ozone production regime, making NO<sub>x</sub> measurements and trends important to track in the Fort Collins area.

<sup>1</sup> [https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=FRAPPE-NCAR\\_Final\\_Report\\_July2017.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=FRAPPE-NCAR_Final_Report_July2017.pdf)

<sup>2</sup> [https://www.fcgov.com/airquality/pdf/20170731\\_NCAREAssessment\\_Final.pdf?1526312514](https://www.fcgov.com/airquality/pdf/20170731_NCAREAssessment_Final.pdf?1526312514)



**Section 3. Additional VOC monitoring beyond the minimally required:**

Similar to the recommendation for an additional ozone monitor to represent transported oil and gas emissions into Fort Collins and the northern part of the nonattainment area, it is recommended that a PAMS station be located upwind of Fort Collins, and downwind of the majority of oil and gas operations.

Thank you again for this opportunity to comment, and we would look forward to collaborating on discussions regarding any potential monitoring network changes that would better characterize the northern part of the nonattainment area, including Fort Collins.

Sincerely,

A handwritten signature in black ink, appearing to read "Cassie Archuleta".

Cassie Archuleta  
City of Fort Collins - Air Quality Program Manager  
970-416-2648  
carchuleta@fcgov.com

**APCD Response:**

Thank you for your comments. We have the following responses.

**Additional Ozone:** Based on monitoring for ozone in the North Front Range, it is not likely that a site in the southeast area of Fort Collins will be as high a concentration area due to the proximity of "fresh" NO<sub>x</sub> sources that will degrade ozone. We do conduct targeted ozone studies every year in different areas of the state. Northern Colorado is under consideration for summer next year and would provide information whether the southeast area of Fort Collins is a good location (such as the Fossil Creek Reservoir area), or if there are more optimal monitoring locations. We do agree that the Fort Collins CSU site is not a good location for maximum ozone concentrations.

**Additional NO<sub>x</sub>:** We agree that having more NO<sub>x</sub> sites is desirable. As noted in our final 2019 Ambient Air Monitoring Network Plan, additional NO<sub>2</sub> monitors may be installed in the North Front Range area as resources exist.

**Additional VOC's:** The general concept behind PAMS sites is to provide a representative, speciated ambient air database which is characteristic of source emission impacts. Thus, we are looking at a location in the oil and gas development area rather than a transported area. As we have resources, we do plan on conducting limited VOC sampling at different locations in the North Front Range to get additional information, including in transported areas.

### 3. Comment from Weld County, received 9/23/2019



OFFICE OF BOARD OF COMMISSIONERS  
PHONE: 970-336-7204  
FAX: 970-336-7233  
1150 O STREET  
P.O. BOX 758  
GREELEY, COLORADO 80632

September 23, 2019

*Via email to [cdphe.commentsapcd@state.co.us](mailto:cdphe.commentsapcd@state.co.us)*

Gordon Pierce  
Program Manager, Technical Services Program  
Colorado Department of Public Health and the Environment – Air Pollution Control Division  
4300 Cherry Creek Drive South  
Denver, Colorado 80246-1530

**RE: Weld County Comments on State of Colorado Enhanced Monitoring Plan for Ozone**

Dear Mr. Pierce,

The Board of Commissioners of Weld County respectfully submits the following comments on the Colorado Department of Public Health and Environment – Air Pollution Control Division (APCD) report entitled: “State of Colorado Enhanced Monitoring Plan for Ozone,” published on August 21, 2019 (EMP). The Weld County Board of Commissioners appreciates the opportunity to provide comments to APCD on this important plan and requests the opportunity for Weld County staff and consultants to confer with APCD regarding air quality monitoring for ozone more generally.

The draft EMP proposes to add new ozone monitors in Weld County. Specifically, the draft EMP proposes one new ozone monitor in the Platteville area of Weld County; one new nitrogen monoxide (NO)/nitrogen dioxide (NO<sub>2</sub>)/nitrogen oxides (NO<sub>x</sub>) monitor in the Platteville area (referred to as the NO<sub>x</sub> monitor); one new total volatile organic carbon (VOC) monitor in Greeley; and one new meteorological measurement station in Platteville. Based on our understanding of the draft EMP, these monitors are in addition to various proposed monitors that would be deployed separately for special studies. Weld County would appreciate the opportunity to confer with and provide input to APCD whenever it proposes specific air quality monitoring locations within Weld County.

While not specifically mentioned in the draft EMP, we are aware that APCD is considering VOC, collocated ozone, and NO<sub>x</sub> monitoring as well as meteorological measurements at the Weld County Airport. From the EMP it is unclear if the ozone, NO<sub>x</sub>, and meteorological monitors

proposed for the Weld County Airport would be collocated with the new VOC monitor instead of the existing VOC monitor in Platteville, or if these monitors would be in addition to the ozone, NO<sub>x</sub>, and meteorological monitors the draft EMP proposes in Platteville. It would be helpful to Weld County's understanding if the final EMP was revised to clarify the relationship between these proposed monitoring locations. If APCD is considering collocating the ozone, NO<sub>x</sub>, and meteorological monitors at the new VOC monitoring site rather than the existing Platteville site, we recommend that the final EMP not specify the location of the ozone, NO<sub>x</sub>, and meteorological monitors to be sited in Weld County in order to increase flexibility during EMP implementation. On the other hand, if APCD is planning to install two ozone, NO<sub>x</sub>, and meteorological monitors in Weld County, we recommend the final EMP be revised to clarify this point, and Weld County would welcome the opportunity to discuss these potential locations with APCD more specifically.

It would be helpful if the final EMP elaborated on APCD's rationale for selecting specific areas for additional monitoring, particularly in the context of the recent ozone measurements collected during the 2019 ozone season and the need for additional data to further understand spatial/temporal trends. More specifically, APCD's Chatfield monitor is currently the highest-reading ozone monitor for the Denver Metro and North Front Range (DM/NFR) area, with a three-year average fourth max 8-hour concentration of 78 ppb for the 2017-2019 period. It could be beneficial for APCD to consider additional monitoring and/or special studies at this site or in the vicinity of Chatfield to provide a better understanding of what contributes to these high concentrations. This additional monitoring could be for NO<sub>x</sub> and VOCs using short-term monitors, long-term monitors, special studies equipment, or the APCD Mobile Lab. It would be helpful to understand if APCD considered Chatfield for deployment of the Photochemical Assessment Monitoring Station (PAMS) system and the rationale for selecting the Rocky Flats site to deploy the PAMS. Information regarding speciated VOCs, which would be measured by the PAMS and not by other VOC monitors being considered by APCD (i.e. summa canisters), could be highly informative in close proximity to the design value monitor. Speciated data could help to provide information about the photochemistry, reactivity, and pollutant aging at the design value monitor. Long-term trends of speciated data could also help inform the efficacy of control strategies. Speciated measurements near Chatfield could be supplemented by studies of the speciated VOC emissions closer to emissions sources. A short-term deployment of the Mobile Lab during a typical period for high ozone in 2020 might provide insights into the roles of urban, rural and industrial emissions from the DM/NFR area.

It would also be helpful if APCD included more information about its special studies monitoring plans in the final EMP or indicated that such plans will be the subject of future draft monitoring plans and therefore will afford Weld County and other stakeholders with an opportunity for review and comment prior to their implementation. It is difficult for Weld County to comment meaningfully on this aspect of the draft EMP without examples of the types of special studies being considered or discussed, the types of questions that special study monitors could help answer, and an understanding of APCD's past performance of special studies of the type being contemplated.

Letter, Gordon Pierce, CDPHE  
September 23, 2019  
Page 3

Additionally, it appears that the draft EMP deviates from both the “2015 Ambient Air Monitoring Network Assessment” (5-year network assessment last finalized in 2015) and the 2019 Ambient Air Network Monitoring Plan in some respects. This is understandable given the rate of change in regulations and advancements in our understanding of the science of Denver Basin air quality. Given the rapid rate of change in both regulations and the state of the science, it could be beneficial for APCD, as part of finalizing the draft EMP, to consider an out-of-cycle update of the 5-year network assessment to ensure that the final EMP is aligned with the 5-year plan and vice versa.

In addition to submission of these and possibly other comments, Weld County would like to work with APCD to explore possible monitoring sites in Weld County that meet both scientific objectives and logistical requirements. Though we generally support site selection for certain additional monitoring in the greater Greeley area, we would like APCD be mindful that the Weld County Airport might not be an optimal monitoring site for a number of reasons. First, the airport will likely not be able to restrict access to the monitoring equipment, while other sites could control access more readily. Second, monitoring NO<sub>x</sub> and ozone would provide better and diverse data if located in areas other than near Greeley (as other monitors are currently in the area). Though collocation of monitors can be useful and efficient, in this case, siting monitors for different pollutants in separate locations would lead to a better understanding of air quality and emissions in the County and the relationships with air quality and emissions in other areas of the Northern Front Range area. Weld County has a number of county-owned parcels that may be superior to the Weld County Airport locations being considered by APCD.


Separately, we wanted APCD to be aware that Weld County is actively considering conducting an assessment of the County’s additional ozone and other air quality monitoring needs to guide development of a possible County monitoring network intended to complement the APCD’s network of monitors. Specific types of information that may be considered as part of this assessment include emissions source location, topography, meteorological factors, inflow of pollutants into the County, and the fate of emissions and pollutants transported away from the County. As Weld County continues to evaluate whether and how to conduct this assessment it would welcome feedback from APCD and opportunities to collaborate with APCD to achieve joint monitoring objectives. We believe that our work might be particularly valuable to APCD as it decides on the specific location of ozone monitors proposed in the draft EMP and in future monitoring plans.

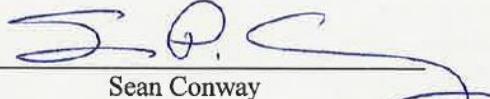
We look forward to discussing these issues with APCD and exploring the coordinated implementation of expanded ambient air monitoring in Weld County and the rest of the Denver Basin. Thank you for the opportunity to provide these comments and local government perspectives. If you have any questions or wish to schedule a meeting to discuss the draft EMP in greater detail, please contact Ben Frissell, Waste Program Coordinator with the Weld County Health Department at (970) 400-2220, and Courtney Taylor, Consultant to Weld County with Ramboll at (303) 382-5467.

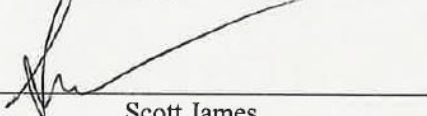
Sincerely,

BOARD OF COUNTY COMMISSIONERS OF WELD COUNTY

  
Barbara Kirkmeyer, Chair

  
Mike Freeman, Chair Pro-Tem

  
Sean Conway

  
Scott James

  
Steve Moreno

pc: Bruce Barker, Weld County Attorney  
Ben Frissell, Weld County Health Department  
John Jacus, Davis Graham & Stubbs LLP

**APCD Response:**

Thank you for your comments. We thank you as well for letting us know that Weld County is considering conducting an assessment of monitoring needs and welcome the opportunity to collaborate with you. To the extent possible, we also welcome your input on proposed monitoring locations within Weld County.

To address your comments, the EMP does not require specific locations to be identified for monitoring, but rather “enhanced O<sub>3</sub> and O<sub>3</sub> precursor monitoring activities to be performed to better understand area specific ozone issues.” The ozone, NO<sub>x</sub> and meteorological monitors proposed for Weld County Airport are not specific to this EMP and funding for those monitors, if obtained, would be from other sources. Thus, they are not discussed in this EMP. Only the VOC monitor is specific to this EMP as a location “in the northern part of the basin near Greeley.”

As the reason for the EMP is to “better understand area specific ozone issues,” the rationale behind focusing on the D-J oil and gas development area, primarily in Weld County, is to look closer at those emissions as ozone precursors. In contrast, the primary PAMS site and other existing monitoring in the Denver area focuses more on the mobile source aspects of ozone precursor emissions. These are the two largest anthropogenic sources of ozone precursors noted in emissions inventories. Due to ozone formation (as a secondarily formed pollutant), topography and meteorology, the highest ozone concentration areas are not in

the source regions, but towards the foothills. The Rocky Flats site was selected over the default NCore site (LaCasa) after meetings with EPA. Summa canister sampling (with speciated analyses) has been performed at the Chatfield site in the past (in 2014), and may be done in the future as part of a special project.

At this point, special studies cannot be further defined. Much of it will depend on staffing and funding resources, as well as specific needs that will come out of PAMS and enhanced PAMS monitoring or State Implementation Plan modeling. Monitoring by other agencies/entities may also be used to inform special studies monitoring. Changes with industry will also dictate what additional special studies monitoring may be performed in the future. As noted above, we would welcome Weld County's input on monitoring in the future.