Nebraska Department of Environmental Quality

2019 Ambient Air Monitoring Network Plan

For the period July 1, 2019 through June 30, 2020

NDEQ Document #19-005

Jim Macy, Director
June 26, 2019

This document fulfills the requirements of 40 CFR Part 58.10 for an annual monitoring network plan as it pertains to the ambient air quality monitoring conducted by the Nebraska Department of Environmental Quality (NDEQ), the Lincoln-Lancaster County Health Department (LLCHD), and the Douglas County Health Department (DCHD).

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Acronyms, Abbreviations, and Definitions

Agencies/Organizations

DCHD - Douglas County Health Department

EPA - United States Environmental Protection Agency

EPA R7 - United States Environmental Protection Agency Region VII

LLCHD - Lincoln/Lancaster County Health Department

NDEQ - Nebraska Department of Environmental Quality

Regulations

CFR - Code of Federal Regulations

DRR - Data Requirements Rule or 40 CFR Part 51 Subpart BB - Data Requirements for Characterizing Air Quality for the Primary SO_2 NAAQS

NAAQS - National Ambient Air Quality Standards

Title 129 - Nebraska Air Quality Regulations

Site Types

IMPROVE - Interagency Monitoring of Protected Visual Environments (monitoring performed to evaluate regional haze)

MDN - Mercury Deposition Network (a type of NADP site)

NADP - National Atmospheric Deposition Program (analysis of deposition components in precipitation. May include NTN and MDN sites)

NCore - National Core multi-pollutant monitoring stations. Monitors at these sites are required to measure particles ($PM_{2.5}$, speciated $PM_{2.5}$, $PM_{10–2.5}$), O_3, SO_2, CO, nitrogen oxides (NO/NO_y), Pb, and basic meteorology.

NTN - National Trends Network (a type of NADP site that analyzes for acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., CA, Mg, K and Na))

SLAMS - State and Local Air Monitoring Stations

Monitor Terminology

AQS - Air Quality System, the name for EPA's air monitoring data base

FRM - Federal Reference Method used for determining compliance with the NAAQS

FEM - Federal Equivalent Method used for determining compliance with the NAAQS

PWEI - Population Weighted Emissions Index (a term defined in 40 CFR Part 58 Appendix D that relates to SO_2 monitoring requirements)

2015 Network Plan - Nebraska's *2015 Ambient Air Monitoring Network Plan & 5-Year Assessment*

2017 Network Plan – Nebraska's *2017 Ambient Air Monitoring Network Plan*

2018 Network Plan – Nebraska's *2018 Ambient Air Monitoring Network Plan*

2019 Network Plan – *Nebraska's 2019 Ambient Air Monitoring Network Plan (i.e., this document)*

Concentration Units

ppb - Parts per billion (a volume/volume concentration unit)

ppm - Parts per million (a volume/volume concentration unit)

mg/m^3 - Milligrams per cubic meter (a mass/volume concentration unit)

$\mu g/m^3$ - Micrograms per cubic meter (a mass/volume concentration unit)

Acronyms, Abbreviations, and Definitions (continued)

Pollutants

CO - Carbon Monoxide

H_2S - Hydrogen sulfide (typically a major component of TRS)

NO - Nitric Oxide

NO_2 - Nitrogen Dioxide

NOy - Total reactive oxides of nitrogen. The parameter NOy – NO measured at NCore sites approximates the concentration of NO_2, but may be higher.

O_3 - Ozone

Pb - Lead

TSP-Pb - Lead sampled using a TSP sampler

$PM_{2.5}$ - Particulate matter with a diameter equal to or less than 2.5 micrometers or microns (reported as $\mu g/m^3$ with air volumes measures at local conditions)

PM_{10} - Particulate matter with a diameter equal to or less than 10 micrometers or microns (reported as $\mu g/m^3$ with air volumes measures at standard conditions (25º C, 1 atm))

$PM_{10-2.5}$ - The difference between PM_{10} and $PM_{2.5}$ (Both being calculated at local conditions)

SO_2 - Sulfur Dioxide

TRS - Total Reduced Sulfur (H_2S + other reduced sulfur-containing compounds)

TSP - Total Suspended Particulates

Definitions

Criteria Pollutants – The six pollutants for which National Ambient Air Quality Standards (NAAQS) have been established: carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, particulates and lead.

in situ - A Latin phrase meaning *in the place*. As used in this report it refers to the formation of pollutants in the atmosphere. For example, ozone is formed *in situ* from the photochemical reaction of pollutant precursors. Ozone is not emitted directly from sources. $PM_{2.5}$ and haze are also formed *in situ*, although they are also emitted by sources. PM_{10} and CO, on the other hand, are largely emitted from sources; *in situ* formation being of minimal importance. NOx and SOx are emitted and then undergo transformations to NO_2 and SO_2; they also can play a role in the *in situ* formation of ozone and $PM_{2.5}$.

Census Terms

Core-Based Statistical Area (CBSA) – a geographic area defined by the Office of Management and Budget containing an urbanized core of at least 10,000 people and adjacent areas that have a high degree of social and economic integration with the core. CBSAs are made up of whole counties or county equivalents.

Metropolitan Statistical Area (MSA) – a CBSA that has at least one urbanized area with population of 50,000 or more.

Micropolitan Statistical Area (MiSA) – a CBSA that has at least one urban cluster with population at least 10,000 but less than 50,000.

I. Introduction and Purpose

This 2019 Ambient Air Monitoring Network Plan (hereafter referred to as the "2019 Network Plan") was prepared to meet the federal requirements set forth in 40 CFR Part 58.10. It serves several purposes.

- Describes the current ambient air monitoring network in Nebraska including:
  - The purpose of each monitoring site, and
  - Changes made since January 1, 2018.
- Discusses ambient air quality issues as they relate to the monitoring network.
- Reviews the ambient air monitoring network to determine that the requirements of 40 CFR Part 58 Appendixes A, C, D and E are met.
- Describes planned and possible changes to the ambient air monitoring network through 2020, as best they can be determined at the time this review was conducted.

II. Public Participation

Federal regulations require annual network plans to be made available for public inspection. The NDEQ meets this requirement by posting it on the NDEQ web site (http://deq.ne.gov/) for 30 days. During the 30 day public inspection period, written comments regarding this Network Plan may be submitted to the Nebraska Department of Environmental Quality (NDEQ). Contact information is provided below.

Mail:

Nebraska Department of Environmental Quality
Attn: David Adams - Air Quality Compliance Section
PO Box 98922
1200 N Street, The Atrium Suite 400
Lincoln, NE 68509

Email:

NDEQ.airquality@nebraska.gov

Informal inquiries may also be directed to David Adams at 402-471-4159. Non-written comments are not necessarily included or addressed as review comments.

The deadline for written comment submittal can be found on the NDEQ web site.

III. Overview of Current Ambient Air Monitoring Network

Nebraska's current air monitoring network is summarized in Table III-1 below, and monitor locations are shown in Figures III-1 and III-2 below. The network description tables in Appendix A provide more detailed information on the network, including site locations and monitoring objectives.

The network includes monitoring sites for ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, lead, PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$ and regional haze (i.e., IMPROVE monitor). The network is operated by the Nebraska Department of Environmental Quality and two local agencies: the Douglas County Health Department (DCHD) and the Lincoln-Lancaster County Health Department (LLCHD).

Table III-1. Nebraska Air Monitoring Network on March 31, 2019. (1)					
	DCHD Omaha MSA (2)(3)	NDEQ Cass County (4)	LLCHD Lincoln MSA	NDEQ Other Areas of NE	Total
SLAMS Sites (includes NCore)	9	1	3	3	16
IMPROVE (5)	0	0	0	1	1
NADP (6)	1	0	0	1	2
Total Monitoring Sites	10	1	3	5	19
Sites by Pollutant: SLAMS Sites including NCore (3)					
Ozone	3	0	1	0	4
Carbon Monoxide	2	0	0	0	2
Nitrogen Oxides	1	0	0	0	1
Sulfur Dioxide	3	0	1	0	4
PM_{10}	3	1	0	0	4
$PM_{2.5}$	4	0	1	2	7
$PM_{10-2.5}$	1	0	0	0	1
$PM_{2.5}$ Speciation	1	0	0	0	1
Lead	0	0	0	1	1
Total Pollutant Sites	18 (3)	1	3	3	25

Footnotes:

(1) This table summarizes the number of operating sites as of 3/31/19 in the NE SLAMS network (including NCore) as well as IMPROVE and NADP sites in Nebraska.

(2) The Omaha MSA encompasses 5 NE counties: Cass, Douglas, Sarpy, Saunders, & Washington. DCHD operates sites in Douglas, Sarpy & Washington counties. NDEQ operates a site in Cass County.

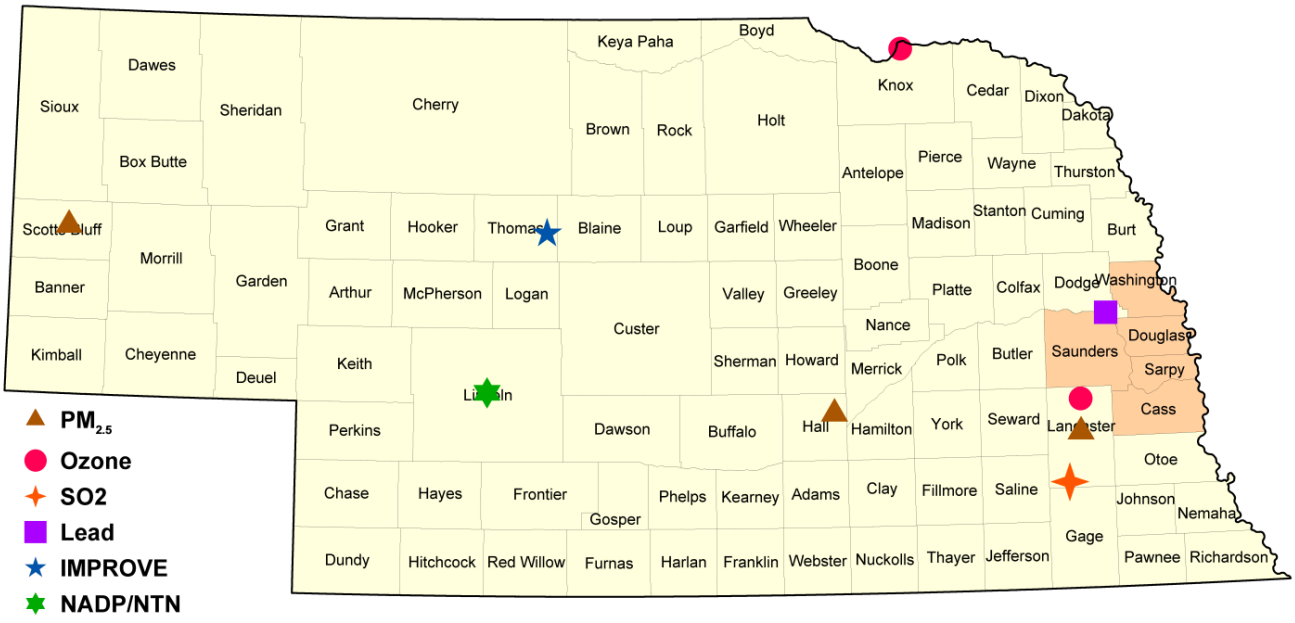
(3) There were 3 multi-pollutant monitoring sites in the Omaha MSA in 2018: 1616 Whitmore – SO_2 & Ozone (2 pollutants); 24th & O Sts (South Omaha) : Ozone and PM_{10} (2 pollutants); and NCore (42nd & Woolworth) - CO, NO-NOy, O_3, SO_2, and PM (8 pollutants). The NCore lead monitor was closed 12/31/17. The number of monitoring sites by individual pollutant is thus greater than the number of monitoring locations within the Omaha MSA and for the state as a whole.

(4) Cass County has limestone mining and processing facilities, which are subject to specific air emission rules for the county set forth in Chapter 21 of Nebraska Administrative Code Title 129 – Nebraska Air Quality Regulations.

(5) IMPROVE – Interagency Monitoring of Protected Visual Environments. These are fine particulate and particulate speciation monitors intended to provide information for studying regional haze that may impact Class I National Park and wilderness Areas. IMPROVE sites are not part of the SLAMS network. EPA is responsible for the design of the IMPROVE network. Changes to the IMPROVE Network within Nebraska do not need to be included in Nebraska's annual network plan, but the existence of the sites are recognized within the network plans. The NDEQ provides administrative support (with EPA funding) for one IMPROVE site at the Nebraska National Forest near Halsey, NE.

(6) NADP - National Atmospheric Deposition Program sites are not part of the SLAMS network. They are not subject to 40 CFR Part 58 requirements, and are not used for NAAQS attainment determinations. They are included in the Network Plan for informational purposes only.

Figure III-1. Nebraska Air Quality Monitoring Sites Outside of the Omaha-Council Bluffs Metropolitan Statistical Area, 3/31/2019



$PM_{2.5}$
Lincoln (Lancaster County)
Grand Island (Hall County)
Scottsbluff (Scottsbluff County)

Ozone
Davey (Lancaster County)
Santee (Knox County; operated by EPA)

Lead
Fremont (Dodge County)

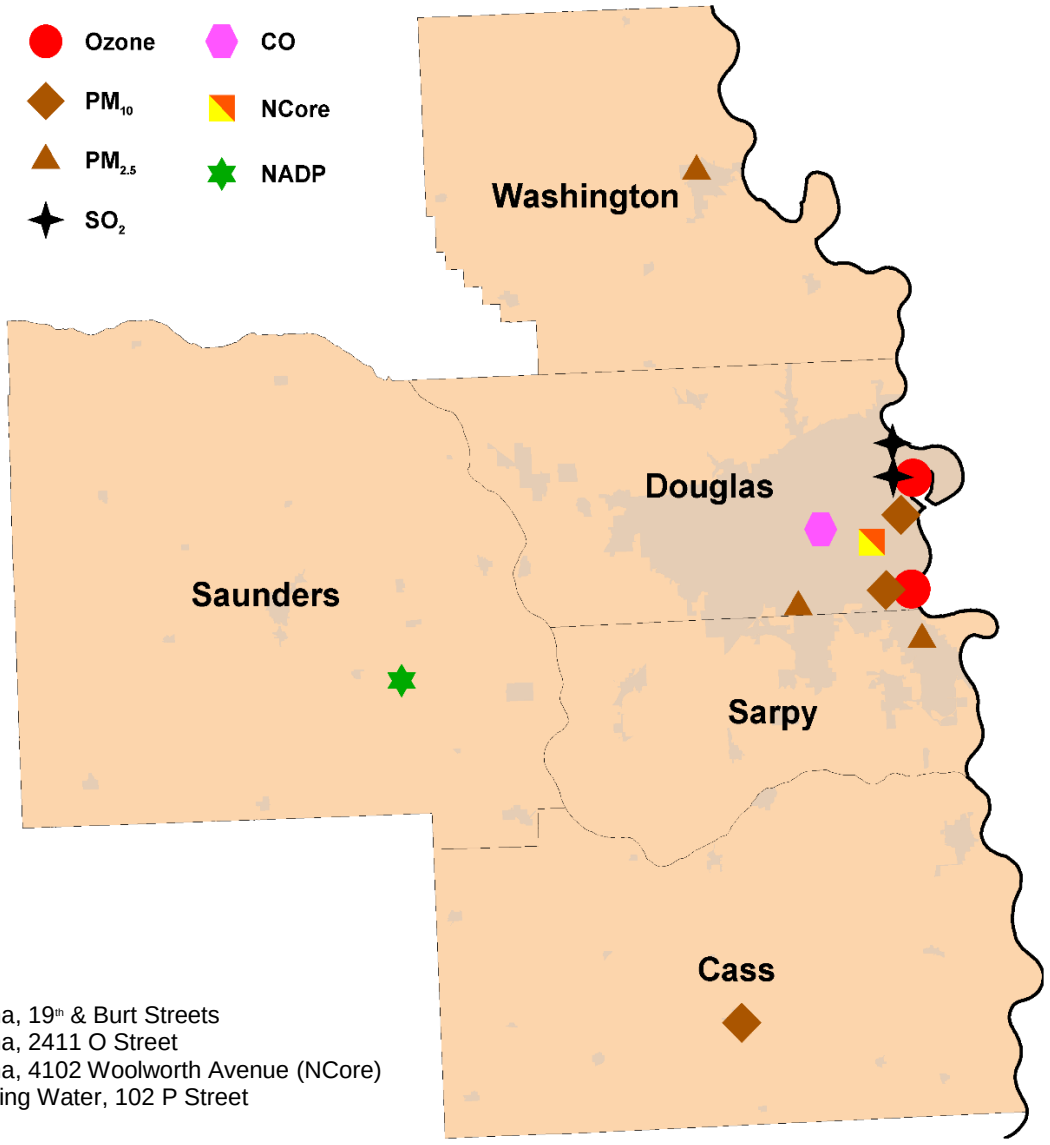
Sulfur Dioxide (SO_2)
Sheldon Station (Lancaster County)

NADP/NTN
Maxwell (Lincoln County)

IMPROVE
Nebraska National Forest (Thomas County)

The Nebraska counties in the Omaha-Council Bluffs Metropolitan Statistical Area are indicated by the orange gray shading.

Figure III-2. Air Quality Monitor Locations in the Nebraska Portion of the Omaha-Council Bluffs Metropolitan Statistical Area



PM_{10}
Omaha, 19th & Burt Streets
Omaha, 2411 O Street
Omaha, 4102 Woolworth Avenue (NCore)
Weeping Water, 102 P Street

$PM_{2.5}$
Omaha, 4102 Woolworth Avenue (NCore)
Omaha, 9225 Berry Street
Bellevue, 2912 Coffey Avenue
Blair, 2242 Wright Street

Ozone
Omaha, 4102 Woolworth Avenue (NCore)
Omaha, 1616 Whitmore Street
Omaha, 2411 O Street

NCore
4102 Woolworth Avenue

Carbon Monoxide
Omaha, 4102 Woolworth Avenue (NCore Trace Monitor)
Omaha, 7747 Dodge Street

Sulfur Dioxide (SO_2)
Omaha, 4102 Woolworth Avenue (NCore Trace Monitor)
Omaha, 1616 Whitmore Street
Omaha, OPPD North Omaha Station

NADP/NTN/MDN
Mead, Saunders County

IV. Nebraska Ambient Air Monitoring Network: January 1, 2018 thru March 31, 2019

This section describes Nebraska's Ambient Air Monitoring Network in place from January 1, 2018 through March 31, 2019, and changes made during that time period. Detailed information on individual monitoring sites, including purpose, scale, monitor specifications, and start dates is contained in Appendix A.

For the most part, this section is organized around the Metropolitan Statistical Areas (MSAs) and Micropolitan Statistical Areas (MiSAs) in which monitoring is conducted.

A. Omaha-Council Bluffs MSA Sites Operated by the DCHD

DCHD operates an ambient air network of 9 sites in Douglas, Sarpy, and Washington Counties, Nebraska. Multi-pollutant monitoring is currently conducted at three of the sites:

- The NCore site monitors for 8 pollutant parameters (CO, NOy/NO, O_3, SO_2, $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, and $PM_{2.5}$ speciation), as well as meteorological parameters and atmospheric radiation (RADNET*);
- The South Omaha site has both an ozone and a PM_{10} monitor; and
- The 1616 Whitmore site has both SO_2 and ozone monitors.

In addition, there are single-pollutant monitoring sites for carbon monoxide (1), $PM_{2.5}$ (3), PM_{10} (1), and SO_2 (1). Thus the Omaha area monitoring network is more extensive than the 9 site total might indicate; if the pollutants are counted separately, there are 18 pollutant monitoring sites.

NDEQ and Iowa DNR share responsibilities for air quality monitoring in the Omaha-Council Bluffs MSA. Iowa currently relies on monitors in the Nebraska portion of the MSA to meet minimum monitoring requirements for ozone, $PM_{2.5}$, PM_{10}, and SO_2.

* Note: RadNet is a nationwide system that monitors the nation's air, drinking water, precipitation, and pasteurized milk to determine levels of radiation in the environment. RadNet sample analyses and monitoring results provide baseline data on background levels of radiation in the environment and can detect increased radiation from radiological incidents. The RadNet monitor is not subject to the network planning process set forth in 40 CFR Part 58.10. It is recognized above for informational purposes only.

There were several changes in the Omaha-DCHD monitoring network on or after January 1, 2018, as detailed below. See Appendix A for detailed information on the sites operated by DCHD.

1. Total Suspended Particulate-Lead Monitoring Discontinued at Omaha NCore Site

As discussed in the 2018 Network Plan, modifications to 40 CFR Part 58 Appendix D effective April 27, 2016 removed the requirement to operate a lead monitor at NCore sites. The Omaha NCore lead monitor historically has found very low lead levels (less than 5% of the NAAQS). DCHD made the decision to close the NCore lead monitor as of December 31, 2017. The 2018 Network Plan presented data in support of DCHD's decision, and in December 2018 EPA Region 7 approved the discontinuation of lead monitoring at this site.

2. Permanent Closure of PM_{10} Monitor at 46th and Farnam Streets

On March 22, 2018 the PM_{10} monitor at 46th and Farnam Streets suffered a major electronics failure requiring temporary closure of the site. DCHD recommended permanent closure of this PM_{10} monitoring site, and NDEQ concurred with this recommendation in the 2018 Network Plan. EPA Region 7 approved the closure of this monitoring site in December 2018.

B. Omaha MSA Sites Operated by the NDEQ

The NDEQ has operated two PM_{10} monitoring sites in the Weeping Water area in Cass County, which is a relatively rural area with limestone mining and processing activities. The Weeping Water Farm site is approximately 1/3 mile northwest of the intersection of Weeping Water spur (State Spur 13K) and Highway 50, close to one of the limestone operations. This site was closed in 2018 at the request of the landowner. NDEQ continues to operate a MetOne BAM continuous sampler at the Weeping Water wastewater treatment plant (Weeping Water City site).

C. Lincoln MSA Sites Operated by the LLCHD

LLCHD operates three SLAMS monitoring sites:

- A $PM_{2.5}$ site at 3140 N Street in Lincoln,
- An ozone site in Davey, (northern Lancaster County) NE, and
- A source-oriented SO_2 monitoring site at NPPD's Sheldon Station near Hallam, NE.

The N Street $PM_{2.5}$ site has three monitors: a primary filter-based FRM sampler, a collocated filter-based FRM sampler, and a continuous MetOne BAM monitor. Data from the continuous monitor is reported to AirNow, but not to AQS.

The Sheldon Station monitor began operation on December 23, 2016 to satisfy changes to 40 CFR Part 51 Subpart BB, §51.1200 – §51.1205 (a.k.a. the Data Requirements Rule) finalized on August 21, 2015. These changes set forth additional requirements with respect to demonstrating attainment with the 1-hour SO_2 NAAQS promulgated in 2010.

D. Sioux City MSA in Dakota and Dixon Counties

There are no monitoring sites in the Nebraska portion of the Sioux City MSA. There are two monitoring sites in the Iowa and South Dakota portions of the MSA:

- A $PM_{10}/PM_{2.5}$ site in Sioux City operated by the Iowa DNR, and
- A multi-pollutant site for SO_2, NO_2, O_3, PM_{10}, and $PM_{2.5}$ in Union County, South Dakota operated by the South Dakota DENR.

The NDEQ has an agreement with South Dakota DENR that Nebraska relies on the Union County monitors and data to meet minimum monitoring requirements for ozone and SO_2 in the Sioux City MSA. Based on population size and ambient PM levels measured at the Iowa and South Dakota sites, PM_{10} and $PM_{2.5}$ monitors are not currently required in the Sioux City MSA (see Table C-2 in Appendix C).

E. Grand Island MSA

The NDEQ operates a $PM_{2.5}$ filter-based FRM sampler at Grand Island Senior High. There were no changes to the monitoring site in the Grand Island MSA from January 1, 2018 through March 31, 2019.

F. Scottsbluff MiSA

The NDEQ operates a $PM_{2.5}$ filter-based FRM sampler at the Scottsbluff Senior High School. There were no changes at this site from January 1, 2018 through March 31, 2019.

G. Fremont MiSA

The NDEQ has operated a TSP-Pb (lead) monitoring site at 1255 Front Street in Fremont since 2010. This site is source-oriented with respect to Magnus-Farley, a brass/bronze foundry. There are two TSP samplers at this site: a primary sampler and a collocated sampler. The site owner notified the Department in March 2018 that he no longer wished to host the lead monitors, which were removed from this location at the end of September 2018. Several alternative locations in Fremont have been identified and are being evaluated. See the discussion in section VI-A.

H. Lexington MiSA

Currently there are no ambient air monitoring sites in the Lexington MiSA.

I. IMPROVE Site

IMPROVE is the acronym for Interagency Monitoring of Protected Visual Environments. These sites contain fine particulate and particulate speciation monitors intended to provide information for studying regional haze that may impact Class I National Park and Wilderness Areas. There are no Class I National Park and Wilderness Areas in Nebraska; the nearest sites are in Colorado and South Dakota.

NDEQ provides administrative support for one IMPROVE site at Halsey National Forest in Thomas County. Data collected at this site facilitates regional haze and pollution transport studies.

J. National Atmospheric Deposition Program (NADP): National Trends Network (NTN) & Mercury Deposition Network (MDN)

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) is a federal, nationwide network of sites that monitor for deposition constituents in precipitation. The deposition parameters examined include acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., calcium, magnesium, potassium and sodium).

There are two NADP/NTN sites in Nebraska: one near Mead that has operated since 1978 and one near North Platte that has operated since 1985. These sites are operated by the University of Nebraska with analytical and data development support from the federal NADP. There were no changes to the NADP/NTN network from January 1, 2018 thru March 31, 2019.

Mercury Deposition Network (MDN) monitoring was initiated at the Mead site on June 26, 2007, and is continuing. At the North Platte site, MDN monitoring was conducted from October 2008 thru October 2010.

The operation of NADP sites is not subject to the provisions of 40 CFR Part 58.10. Their inclusion in this Network Plan is for informational purposes only. More information on the NADP/NTN and the NADP/MDN sites can be found in Appendix A of this network plan. For NADP, NTN and MDN program information see: http://nadp.sws.uiuc.edu/ or http://nadp.sws.uiuc.edu/mdn/.

V. Considerations for Network Planning

A. EPA Air Monitoring and Network Design Requirements

The Nebraska Ambient Air Quality Network must comply with the applicable requirements of 40 CFR Part 58 Appendices A through E. As the review in Appendix C of this plan verifies, the Nebraska ambient air monitoring network, operated by the NDEQ, DCHD, and LLCHD, is meeting all the applicable requirements of 40 CFR Part 58 Appendixes A, C, D & E.

Additional information is provided below concerning several potential monitoring site requirements.

1. Prevention of Significant Deterioration (PSD) Monitoring

Part 58 Appendix B applies to Prevention of Significant Deterioration (PSD) sites. Monitoring required for PSD is generally conducted by the source, not a state or local monitoring agency (i.e., not by NDEQ, DCHD, or LLCHD). This is the case at this time. Thus compliance with Appendix B is not directly addressed in this network plan. No PSD-required background monitoring took place in Nebraska during 2018.

2. Lead Monitoring Waiver for Nucor Steel in Norfolk

40 CFR Part 58 Appendix D Section 4.5 requires source-oriented lead monitoring near lead sources that emit 0.5 tons or more per year. A waiver from this monitoring requirement is allowed if it can be demonstrated that ambient lead levels will not exceed 50% of the NAAQS.

Nucor Steel in Norfolk, NE submitted a waiver request in 2011 and provided modeling that demonstrated ambient lead levels would not exceed 50% of the NAAQS. NDEQ reviewed and concurred with a revised Nucor submittal. EPA approved this waiver request in April 16, 2014. The waiver is effective for 5 years and thus expired in April 2019.

Table V-1. Reported Lead (Pb) Emissions at Nucor Steel 2012 through 2018

Year	2012	2013	2014	2015	2016	2017	2018
Pb Emissions (tons per yr)	0.63	0.81	0.11	0.91	0.15	0.19	0.22

Table V-1 above lists reported lead emissions at Nucor Steel from 2012 through 2018. Nucor lead emissions were above the 0.5 ton per year monitoring threshold in 2012, 2013, and 2015 and below it in 2014, 2016, 2017, and 2018. Thus a lead monitor may be required at the Nucor Steel site in 2019 unless the current monitoring waiver is renewed.

The NDEQ is formally requesting renewal of this waiver. The basis for this request is the source-oriented lead modeling analysis completed for this facility in 2019, which demonstrated a modeled maximum ambient lead concentration of 0.04 $\mu g/m^3$, which is less than 50% of the lead NAAQS. See Appendix D for a detailed description of the modeling analysis.

B. Air Quality and NAAQS Attainment

The monitoring results for 2016 through 2018 from all monitoring sites in Nebraska and adjacent state portions of the Omaha and Sioux City MSAs are in attainment with the NAAQS. See the monitoring data tables in Appendix B for more information on the 2016 through 2018 monitoring results.

Nebraska has never had a declared non-attainment determination. Nebraska is currently classified as "unclassified/attainment' with respect to the 1-hour NO_2 and SO_2 NAAQS established in 2010. See the Sulfur Dioxide and Nitrogen Dioxide sections below for an explanation as to how this relates to monitoring needs.

1. **Sulfur Dioxide (SO_2)**: The NAAQS for SO_2 was revised in 2010 to establish a 1-hour average standard of 75 ppb (99th percentile of daily maximum 1-hour concentrations), which was reviewed and retained in 2018. All areas of Nebraska have been designated as "Attainment/Unclassifiable" with respect to this standard except for Lancaster County, which has been designated "Unclassifiable", and Douglas County, which will be designated by December 31, 2020. In accordance with 40 CFR Part 51 Subpart BB (known as the Data Requirements Rule), source-oriented ambient air monitoring is being conducted at two coal-fired electricity generating stations in these counties: North Omaha Station (Douglas County) and Sheldon Station (Lancaster County).

   There are three SO_2 monitors in Omaha, one in the Union County, SD portion of the Sioux City MSA, and one in the Lincoln MSA (Lancaster County). The 1-hour SO_2 levels found at these sites are in attainment with the NAAQS. See Appendix B Table B-3.

   In Omaha the 1-hour SO_2 Design Value for 2016-2018 at the neighborhood-scale NCore site was 38% of the NAAQS. The first two years of data at the North Omaha Station monitor show maximum SO_2 concentrations at 48% of the NAAQS, while the 2016-2018 Design value at the nearby Whitmore site was 67% of the NAAQS.

   In the Sioux City MSA, the SO_2 Design Value in Union County, SD was 5% of the NAAQS.

   The first two years of data at the Sheldon Station monitor in the Lincoln MSA show maximum SO_2 concentrations at 36% of the NAAQS.

   Nebraska also has two areas that are subject to the ongoing requirements of the Data Requirements Rule by demonstrating attainment with the SO_2 NAAQS by air quality modeling. As required by 40 CFR 51.1205(b), the NDEQ is submitting an annual report to document the annual SO_2 emissions of each applicable source in these areas and assess the cause of any emissions increase from the previous year. This report is being submitted as Appendix E of this Annual Monitoring Network Plan.

2. **Nitrogen Dioxide (NO_2)**: The NAAQS for NO_2 was revised in 2010 to establish a 1-hour maximum standard of 100 ppb (98th percentile of the daily maximum 1-hour values). The annual mean standard of 53 ppb was retained at that time. An "unclassifiable/attainment" classification currently applies to all counties in Nebraska with respect to these standards. In April 2018 EPA announced the results of a review of the 2010 NO_2 NAAQS, which concluded that the current standards protect the public health with an adequate margin of safety and would be retained. NDEQ has recommended that all counties in Nebraska be classified "Unclassifiable/Attainment" for NO_2.

   There is one NO_2 monitoring site in Union County, SD within the Sioux City MSA. This is an area background site with 1-hour NO_2 levels at 16% of the NAAQS.

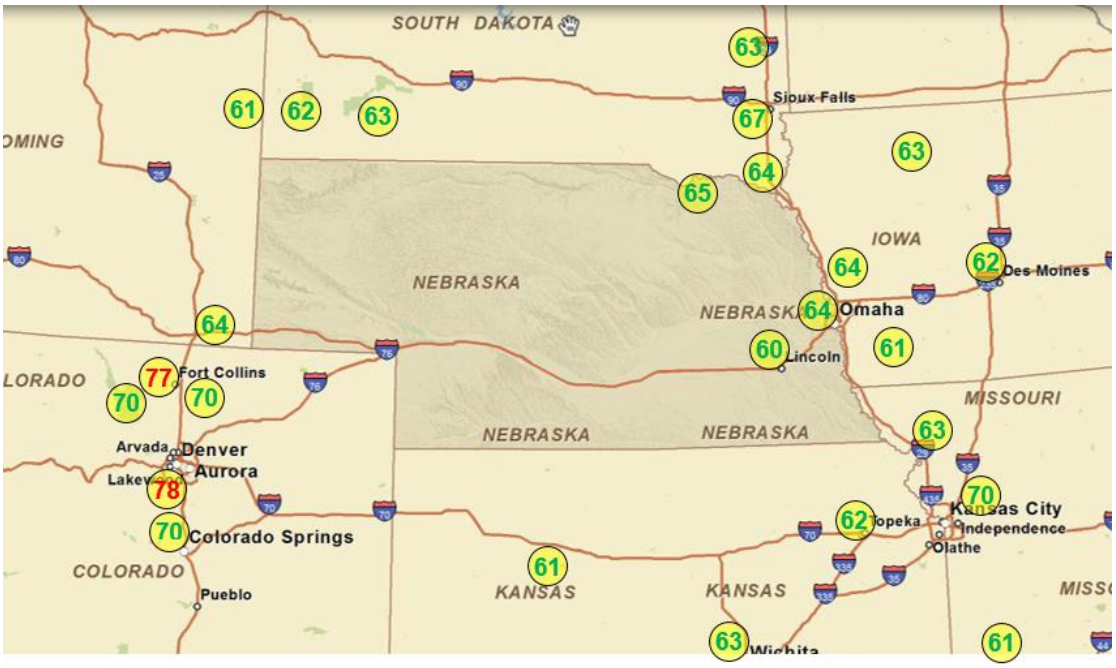
   There is an NOy/NO monitor at the Omaha NCore site. The NOy-NO parameter generally approximates NO_2, with NOy-NO being equal to or possibly higher than NO_2. The 1-hour NOy-NO levels at the Omaha NCore site were at 36% of the 1-hour NO_2 NAAQS in the 2016 through 2018 time frame.

See Appendix B Tables B-4a and B-4b for NO_2 and NOy-NO concentration data.

3. **Carbon Monoxide (CO):** There are 2 CO monitors in Nebraska. The 78th & Dodge Streets site is a near-road, highest concentration site, while the Omaha NCore CO monitor is a neighborhood-scale site. Both monitors are finding CO levels less than 20% of the 8-hour NAAQS and less than 10% of the 1-hour NAAQS. See Appendix B Table B-2. Vehicle emissions are the primary source of ambient CO, which has been reduced by stricter federal vehicle emission standards. The current CO NAAQS were established in 1984 and last reviewed by EPA in 2011, when it was determined that the NAAQS were protective and did not need to be changed.

4. **Ozone:** On October 1, 2015, EPA strengthened (lowered) the ozone NAAQS from 0.075 ppm to 0.070 ppm. As shown in Appendix B Table B-1, the 2016-2018 Design Values (DVs) at monitoring sites in Nebraska and adjacent state areas in the Omaha and Sioux City MSAs are in attainment with this standard. Ozone DVs ranged from 87% to 91% of the NAAQS in the 2016-2018 time-frame. The highest ozone levels are found in the Omaha MSA and near Santee, NE (an EPA CASTNET site). The map in Figure V-1 below shows the 2016-2018 ozone DVs for monitoring sites in and around Nebraska.

Figure V-1. Three-Year (2016 -- 2018) Ozone Design Values (DVs, in ppb) for Locations In and Around Nebraska(1)

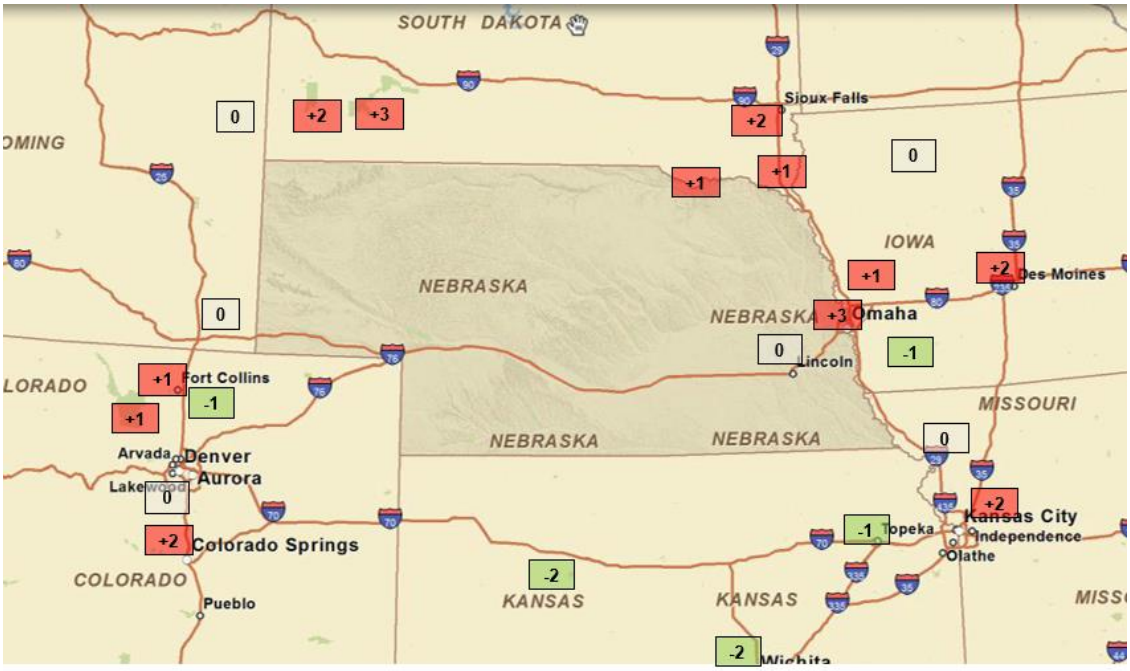


Footnotes:

(1) Where there is more than one monitoring site in a locale, the highest ozone DV is shown. DVs in green are in attainment with the NAAQS (70 ppb), while red values exceed the NAAQS.

The map in Figure V-2 shows the difference between the 2016-2018 ozone design value and the site-average design value from 2014 through 2018 for monitor sites in the Nebraska region. This time period encompasses ozone trends since the historic drought year of 2012. With the exception of Kansas, most sites in the region show 2016-2018 ozone design values that are higher than the site average since 2014.

Figure V-2. Difference between 2016-2018 Ozone Design Value (ppb) and 2014-2018 Site Average Design Value for Monitor Sites in and Around Nebraska



Footnote: Red background behind difference value indicates sites with 2018 DV higher than the site average; green background indicates sites with 2018 DV lower than the site average. Where there is more than one monitoring site in a locale, the value for the site with the highest difference is shown.

Figures V-3a, V-3b, and V-3c show plots of annual 4th-high 8-hour ozone values for monitors in the Omaha-Council Bluffs MSA, Lincoln and Sioux City MSAs, and for rural monitor sites in the region, respectively. The plots show no clear trend from 2013 to 2015, with some sites showing increasing values, some flat, and some decreasing. However, nearly all sites in the region show an upward trend in 4th-high 8-hour ozone values since 2015 or 2016. This trend is evident for many of the rural sites as well as those in more urban areas.

Figure V-3a. Annual 4th High 8-Hour Ozone Trends 2013 through 2018 in the Omaha-Council Bluffs MSA

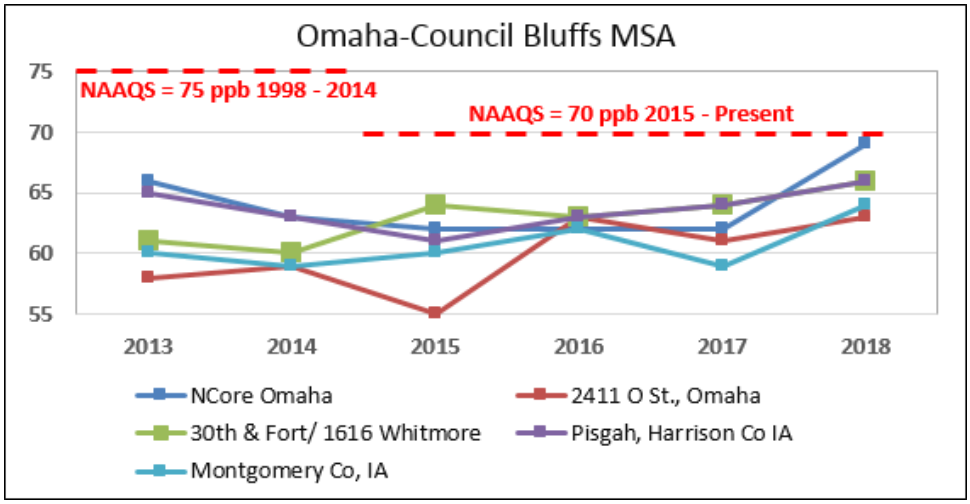


Figure V-3b. Annual 4th High 8-Hour Ozone Trends 2013 through 2018 in the Lincoln, NE and Sioux City, IA MSAs

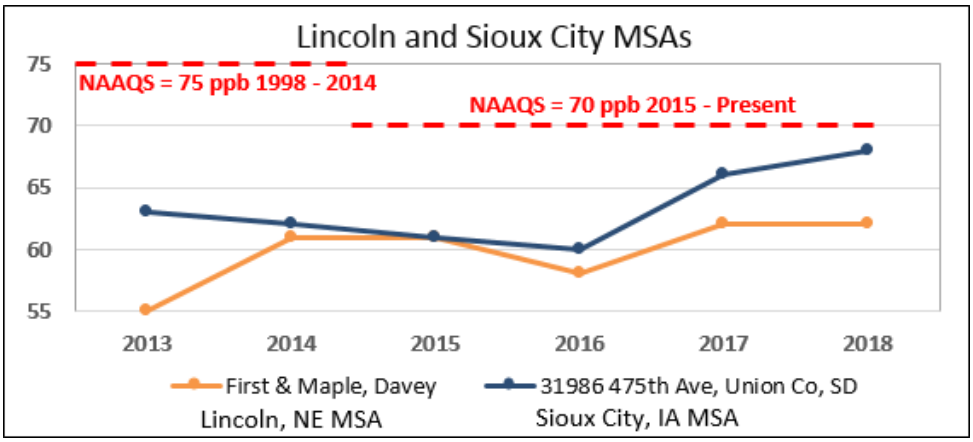
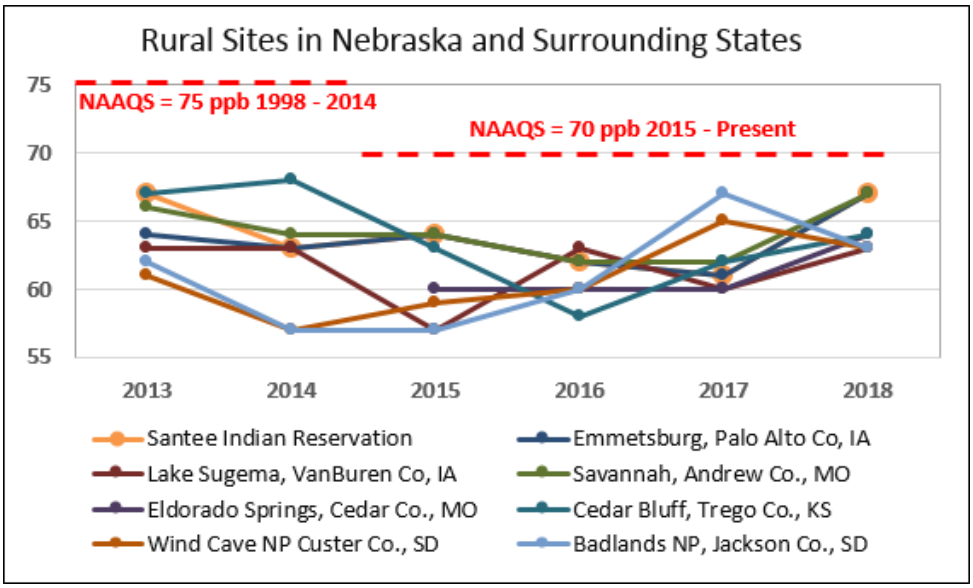


Figure V-3c. Annual 4th High 8-Hour Ozone Trends 2013 through 2018 at Rural Sites in Nebraska and Surrounding States



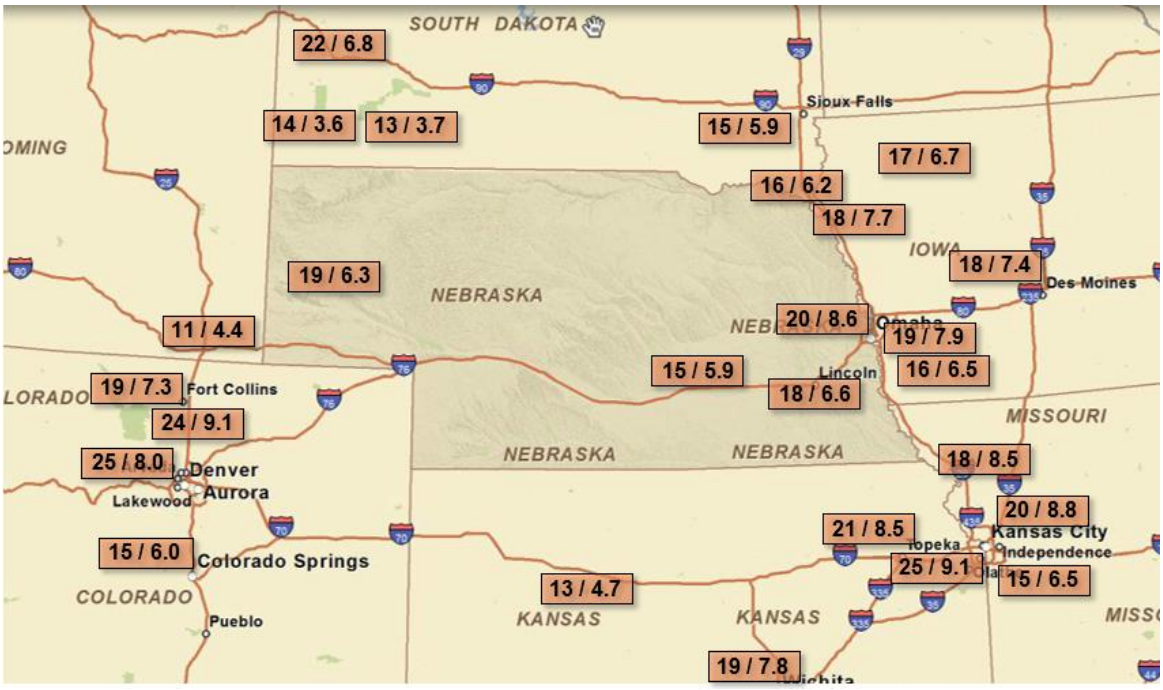
5. **$PM_{2.5}$:** EPA last revised the $PM_{2.5}$ NAAQS in 2012, setting the annual average NAAQS at 12 µg/m^3 (changed from 15 µg/m^3) and retaining the 24-hour NAAQS at 35 µg/m^3. As shown in Table V-2 below and in more detail in Appendix B Tables B-6a and B-6b, all $PM_{2.5}$ sites in Nebraska are in attainment with the NAAQS.

Table V-2. $PM_{2.5}$ Levels (2016 -- 2018 DVs) as a Percent of the NAAQS (1)		
Location	24-Hour Average DV	Annual Average DV
Omaha MSA	56%	74%
Lincoln MSA	48%	55%
Sioux City MSA	52%	64%
Grand Island MSA	43%	51%
Scottsbluff MiSA	54%	52%
Footnote (1): Where there is more than one monitoring site in a locale, the highest DV was used to calculate the % NAAQS value shown above.		

The highest $PM_{2.5}$ concentrations were found in the Omaha MSA and the second highest in the Sioux City MSA.

Figure V-4 below shows the DVs for $PM_{2.5}$ sites in and around Nebraska. Unlike ozone, $PM_{2.5}$ concentrations do not appear to be uniformly distributed over large areas of Nebraska. $PM_{2.5}$ levels are generally lower in Grand Island and Scottsbluff than in the larger metropolitan areas in eastern Nebraska. The relatively high 24-hour DV at Scottsbluff (19 $\mu g/m^3$) appears to be an exception. A high 98th percentile value in 2017 (24.1 $\mu g/m^3$) is likely to have been caused by smoke impacts from wildfires. The highest daily values in 2017 coincided with a widespread smoke plume from wildfires in the western states and a cluster of fires in southeastern Montana and northern Wyoming.

Figure V-4. $PM_{2.5}$ 2016-2018 Design Values (DVs) for Sites In and Around Nebraska(1)(2)



Footnotes:
(1) The first number is the 24 hour average DV and the second number is the annual average DV.
(2) When there was more than one site in a metropolitan area, the highest DVs are shown.

Wildfires as well as prescribed fires also can impact air quality in eastern Nebraska. Prescribed burns are used in Nebraska and near-by states for prairie conservation and maintenance of grazing lands. The Flint Hills of Kansas and Oklahoma, and areas near the Flint Hills in Kansas, are areas of concentrated use of prescribed fires, primarily in the spring months. In 2017 smoke from prescribed fires in the Flint Hills and near-by areas was a major source of elevated $PM_{2.5}$ levels experienced in Lincoln and Omaha in early April. In 2018 favorable weather patterns during Flint Hills burn events resulted in minimal impacts on air quality in Nebraska.

NDEQ is working with Kansas Department of Health and Environment (KDHE), EPA Region 7, local air quality agencies, and other stakeholders on strategies to improve air quality in Nebraska during the spring prescribed burn season. In February 2018, representatives of NDEQ, EPA Region 7, Kansas Department of Health and Environment, Douglas County Health Department, Omaha Air Quality Control, and Lincoln-Lancaster County Health Department met in Lincoln to discuss issues surrounding prescribed burning and the forecast for the 2018 spring burn season. These activities were continued and refined during the 2019 spring burn season.

To provide up-to-date information to the public regarding prescribed burning, NDEQ created a smoke awareness web page in March 2017. During the burn season, current smoke forecast information is provided, along with links to the Kansas Smoke Management Plan, AirNow, and other related information. NDEQ has also collaborated with the Nebraska Department of Health and Human Services (DHHS), LLCHD, and DCHD to develop a public smoke advisory system which was announced on April 10, 2018. Smoke advisories are issued by DHHS for impacted counties based on forecasts provided by KDHE.

6. **PM_{10}:** EPA last modified the PM_{10} NAAQS in 2006 when the 50 $\mu g/m^3$ annual average standard was dropped and the 150 $\mu g/m^3$ 24-hour standard was retained; this standard was also reviewed and retained in 2012. PM_{10} is more source-oriented and remains more localized to its point of origin than $PM_{2.5}$. As shown by the data in Appendix B Table B-5a and B-5b, all the monitors in Nebraska are demonstrating attainment with the PM_{10} NAAQS over the 2016 through 2018 time-frame.

   The PM_{10} NAAQS states that the 24-hour standard of 150 μ g/m^3 is not to be exceeded more than once per year on average over the latest 3-year time frame, where an exceedance is a 24-hour average value of 155 $\mu g/m^3$ or more. This means that the 4th high value over the most recent 3 years needs to be below 155 $\mu g/m^3$. For the 2016-2018 time frame, most PM_{10} monitors in Nebraska had 4th-high 24-hour average values that were 42% or less of the NAAQS (see Appendix B, Table B-5b).

7. **Lead:** The lead NAAQS was last changed in 2008, when it was tightened from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$. This standard was reviewed and retained in 2016. At the beginning of 2018 there were two lead monitoring sites in Nebraska: Fremont and Omaha NCore. Both demonstrated attainment with the NAAQS (see Appendix B Table B-7).

   a) Omaha NCore Site: The 2016-2018 Design Value (DV) for this site was 2% of the NAAQS. The Part 58 revisions effective April 27, 2016 no longer require lead monitoring at NCore sites. As discussed in Section IV-A, DCHD discontinued lead monitoring at the Omaha NCore site on December 31, 2017, and this action was approved by EPA Region 7 in December 2018.

b) Fremont Site: This site is source-oriented with respect to Magnus-Farley, a bronze and brass casting facility. In 2012 the maximum 3-month average ambient lead level was 0.14 $\mu g/m^3$ or 93% of the NAAQS. In 2016 thru 2018 the maximum 3-month average lead concentrations were lower at 41%, 28%, and 16% of the NAAQS, respectively. Facility awareness and diligence, coupled with NDEQ feedback on ambient air lead concentrations, appear to have facilitated the air quality improvements. See Appendix B Table B-7 for the 2016 thru 2018 ambient air quality summary data. As noted in section IV-G, in 2018 the landowner at this site asked that the monitor be removed, which occurred at the end of September 2018. Alternative sites for this monitor are being evaluated. See Section VI-A for further discussion.

C. Population Trends and Network Design

Population data is reviewed as part of the network planning process because:

- Population growth may be associated with pollution source growth;
- High population density generally correlates with high air pollution potential; and
- Some 40 CFR Part 58 requirements are based on population and/or federally defined metropolitan statistical definitions.

Overall growth trends in Nebraska appear basically unchanged from those described in previous annual Network Plans. Most of the population growth is occurring in Nebraska's three most populous and densely populated counties: Douglas, Lancaster, and Sarpy (i.e., the Omaha and Lincoln MSAs).

The basic design of the Nebraska ambient air monitoring network is consistent with these population trends: 74% of the monitoring sites and 88% of the pollutant monitors are located within the Omaha and Lincoln MSAs. The Omaha MSA network contains 58% of the monitoring sites in Nebraska and 76% of the monitors.

D. Funding

Air monitoring is supported by a combination of federal, cash, state, and local funding sources. Table V-3 on the next page provides a summary of the primary funding sources used for air monitoring.

Federal CAA §103 funding is used to operate $PM_{2.5}$ and IMPROVE monitors. Funding for April 2018 through March 2019 was maintained at the same level as the previous year.

Current funding levels are adequate to continue the operation of the existing Nebraska air monitoring network, provided major new equipment purchases are not required.

Table V-3: Primary Funding Sources Used to Support Air Monitoring in Nebraska	
Nebraska Department of Environmental Quality (NDEQ)	
Funding Source	**Comments**
State General Funds	At a minimum must be sufficient to meet minimum federal match requirements
State Title V Funds	Fees paid by major sources based on the quantity of air pollutants they emit. NDEQ collects Title V fees for sources throughout Nebraska, except those regulated by LLCHD and Omaha Air Quality Control. Title V funds cannot be used for state/local match.
CAA §105 Funds	Federal grant funds used for air monitoring activities set forth in a bi-annually negotiated EPA-NDEQ work plan. Requires a 40% state/local match. A portion of this grant funding is passed on to DCHD and LLCHD.
CAA §103 Funds	Federal grant funds used for air monitoring activities set forth in a bi-annually negotiated EPA-NDEQ work plan. This money is currently limited to funding $PM_{2.5}$ and IMPROVE monitoring, and sometimes for specified equipment purchases and/or special monitoring studies. Requires no state/local match. A portion of this grant funding is passed on to DCHD and LLCHD.
Douglas County Health Department (DCHD)	
Local County Funds	At a minimum must be sufficient to meet minimum federal match requirements
City of Omaha Title V funds	See *State Title V Funds* comments above. Omaha Air Quality Control regulates air emission sources in the City of Omaha, including the collection of Title V fees from major sources. A portion of the Omaha Title V funds are directed to DCHD to support air monitoring. Title V funds cannot be used for state/local match.
CAA §105 Funds	NDEQ passes-through a portion of the Federal §105 funds to DCHD for activities described in an NDEQ/DCHD work plan. DCHD is required to meet the 40% state/local match requirement.
CAA §103	NDEQ passes-through a portion of the federal §103 funds to DCHD for activities described in an NDEQ/DCHD work plan, primarily $PM_{2.5}$ related monitoring activities. There is no state/local match requirement.
Metropolitan Area Planning Assoc. (MAPA) Funds	Typically federal grant funds obtained by MAPA are for specific purposes such as transportation or homeland security. Historically they have been used for equipment purchases and site set-up, not network operating costs.
Lincoln Lancaster County Health Department (LLCHD)	
Local County Funds	At a minimum must be sufficient to meet minimum federal match requirements
Lancaster County Title V funds	See *State Title V Funds* comments above. LLCHD regulates air emission sources in Lancaster County, including the collection of Title V fees from major sources. A portion of the Title V funds are used to support air monitoring activities performed by LLCHD. Title V funds cannot be used for state/local match.
CAA §105 Funds	NDEQ passes-through a portion of the Federal §105 funds to LLCHD for activities described in an NDEQ/LLCHD work plan. LLCHD is required to meet the 40% state/local match requirement.
CAA §103	NDEQ passes-through a portion of the federal §103 funds to LLCHD for activities described in an NDEQ/LLCHD work plan, primarily $PM_{2.5}$ related monitoring activities. There is no state/local match requirement.

VI. Anticipated Nebraska Air Monitoring Network Modifications

NDEQ anticipates two permanent monitoring site relocations will be required in 2019-2020 as explained below.

A. Fremont Lead Monitor: Permanent Relocation

The NDEQ has operated a TSP-Pb monitoring site at 1255 Front Street in Fremont since 2010. This site is source-oriented with respect to Magnus-Farley, a brass/bronze foundry, and has primary and collocated TSP samplers. As described in Section IV-G, the site owner notified the Department in March 2018 that he no longer wished to host the lead monitors, which were removed from this location at the end of September 2018. Two alternative site locations in Fremont have been identified and are being evaluated. The NDEQ has provided information on these sites to EPA Region 7 and is awaiting visits to the prospective sites by Region 7 staff to assess their suitability. After a suitable site or sites are identified, NDEQ will begin negotiations with landowners on a site-hosting agreement.

B. Omaha PM_{10}: Anticipated Relocation of 19th and Burt Streets Monitor

DCHD has operated a Population and Source-Oriented PM_{10} monitoring site at 19th and Burt Streets in Omaha since 2001. This site has primary and collocated filter-based samplers situated on the roof of a building owned by Creighton University. The university has informed DCHD of its intent to demolish this building to make way for new construction. Demolition may begin later in 2019. As a result, DCHD is beginning the search for suitable alternative locations for this monitoring site.

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Appendix A: Ambient Air Monitoring Sites in Nebraska

See Appendix C for a compliance review with respect to 40 CFR Part 58 Appendixes A through E.

Omaha NCore Site Operated by DCHD

Site Name: Omaha NCore (1)	AIRS ID: 31-055-0019 (1)
Location: 4102 Woolworth St., Omaha	Latitude: 41.246792º Longitude: -95.973964º
Operating Agency: Douglas County Health Department	
Purpose: NCore	Scale: Neighborhood
Monitor/Pollutant: Carbon Monoxide (CO) - Trace Level	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 48i-TLE	EPA Method: RFCA-0981-054 (AQS 554)
Start-Up Date: 1/20/11	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Ozone (O_3)	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49i	EPA Method: EQOA-0880-047
Start-Up Date: 4/1/11	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Nitrogen Oxides (NO/NO_y)	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 42i $NO/NO_2/NOx$	EPA Method: RFNA-1289-074
Start-Up Date: 1/20/11	Closure Date: Currently operating
Data used for NAAQS comparison: Not Applicable. Monitors for NO & NOy, but not NO_2	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: Sulfur Dioxide (SO_2) – Trace Level	
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 43i-TLE	EPA Method: EQSA-0486-060 (AQS 560)
Start-Up Date: 1/20/11	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: $PM_{2.5}$ (2)	
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (2) (3)	EPA Method: EQPM-0308-170
Start-Up Date: 2/1/04 (2)	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: $PM_{2.5}$ (2)	
Type/POC: POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: 2025 Sequential (2)	EPA Method: RFPS-0498-118
Start-Up Date: 1/1/99 (2)	Closure Date: Currently operating
Data used for NAAQS comparison: Only when POC 1 data is not available.	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor/Pollutant: $PM_{2.5}$ Speciation	
Type/POC: Speciation / POC 05	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: $PM_{2.5}$ Speciation	Sampler Type: SASS and a 3000 URG (3)
Start-Up Date: 5/25/01	Closure Date: Currently operating
Data used for NAAQS comparison: Not applicable	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Continued on next page	

Appendix A: Ambient Air Monitoring Sites in Nebraska

Omaha NCore Site Operated by DCHD - continued

Site Name: Omaha NCore AIRS ID: 31-055-0019 (See Comment 1)
Location: 4102 Woolworth St., Omaha Latitude: 41.246792º Longitude: -95.973964º
Operating Agency: Douglas County Health Department (continued from previous page)

Monitor/Pollutant: PM_{10} – STP & Local Conditions
Type/POC: Continuous / POC 01 Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 [3)] EPA Method: EQPM-0798-122
Start-Up Date: 1/1/11 [(3)] Closure Date: Currently operating
Data used for NAAQS comparison: Local conditions data only
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Monitor/Pollutant: $PM_{10-2.5}$ – Local Conditions
Type/POC: Continuous / POC 01 Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 [(3)] EPA Method: EQPM-0709-185
Start-Up Date: 1/1/11 [(3)] Closure Date: Currently operating
Data used for NAAQS comparison: Yes
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable

Monitor/Pollutant: Lead (Pb) – Non-source oriented
Type/POC: Primary / POC 01 Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol TSP-Pb (ICP-MS) EPA Method: EQL-0310-189
Start-Up Date: 12/1/12 Closure Date: 12/31/17
Data used for NAAQS comparison: NA (not operating)
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: NA (site closed)

Meteorological Parameters – Manufacturer & Model – Start Date
Wind Direction & Velocity – MetOne 50.5 Sonic - 5/13/11
Temperature - MetOne Model 083D – 4/12/11 Barometric Pressure – MetOne Model 090D – 4/12/11
Relative Humidity – MetOne 083D – 4/12/11 Solar Radiation – MetOne Model 096-1 – 4/12/11
Closure Date: Currently operating

Atmospheric Radiation – RadNet Air Monitor
RadNet is a nationwide system that monitors the nation's air, drinking water, precipitation, and pasteurized milk to determine levels of radiation in the environment. RadNet sample analyses and monitoring results provide baseline data on background levels of radiation in the environment and can detect increased radiation from radiological incidents. The RadNet monitor is not subject 40 CFR Part 58 requirements. It is recognized in this Network Plan for informational purposes only. The RadNet monitor began operating at the Woolworth site in June 2006.

Comments:

1. Site History: Site 31-055-0019 was referred to as the "Woolworth site" through 12/31/10. The Woolworth site was a PM monitoring site with $PM_{2.5}$ filter-based, continuous and speciation monitors located on the roof of Douglas County Hospital. To accommodate NCore monitoring, more space was required and the site was moved approximately 550 ft north to the roof of an adjacent/attached building in December 2010. Gaseous and meteorological monitors began operation in 2011 and lead in 2012. Lead monitoring was discontinued at the end of 2017 in accordance with the 2017 Network Plan. Permanent discontinuation of lead monitoring was approved by EPA Region 7 in December 2018.
2. On 1/1/99 $PM_{2.5}$ sampling was initiated using primary and collocated R&P 2025 filter-based FRM samplers. A continuous monitor was first operated at this site 2/1/04. The initial continuous monitor was an R&P TEOM, which was not an FRM/FEM. It was used for AirNow reporting, but was not used for NAAQS comparison. It was replaced by a MetOne BAM FEM monitor on 1/6/09. The MetOne BAM was operated as an auxiliary monitor to the primary and collocated R&P 2025 FRM samplers through September 2009. Beginning 10/1/09, the MetOne BAM was designated the primary sampler and an R&P 2025 FRM sampler was retained as the collocated sampler.
3. Between 10/28/10 and 1/3/11, the $PM_{2.5}$ Met One BAM-1020 was temporarily removed from service while being reconfigured to operate as the $PM_{2.5}$ portion of a paired $PM_{10-2.5}$ monitoring system. The other part of the paired system is a PM_{10} Met One BAM-1020, which is configured to report data in local and STP conditions. The paired units comprising the $PM_{10-2.5}$ monitoring system were put on-line on 1/1/11.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Carbon Monoxide Sites in the Omaha MSA Operated by DCHD

Site Name: 78th & Dodge – Omaha	AIRS ID: 31-055-0056
Location: 78th St and W Dodge Rd, Omaha	Latitude: 41.259175º Longitude: -96.028628º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Carbon Monoxide (CO)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 48c	EPA Method:
Purpose: Highest Concentration	Scale: Microscale
Start-Up Date: 10/01/07	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Combined Sulfur Dioxide & Ozone Site in the Omaha MSA Operated by DCHD

Site Name: Whitmore – Omaha	AIRS ID: 31-055-0053
Location: 1616 Whitmore St, Omaha (1)	Latitude: 41.297778º Longitude: -95.937500º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Sulfur Dioxide (SO_2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 43c-tle	EPA Method: EQSA-0486-060
Purpose: High Conc. & Population Oriented (1)	Scale: Neighborhood (1)
Start-Up Date: 7/1/99	Closure Date: Currently operating*
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: Ozone (O_3) (2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49C	EPA Method: EQOA-0880-047
Purpose: Population Oriented (1)	Scale: Neighborhood (1)
Start-Up Date: 4/1/15	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments:	
(1) This site is in a socioeconomically disadvantaged area.	
(2) The ozone monitor from the 30th & Fort Street site was re-located to this site in 2015.	

Permanently Closed(1) Ozone Site in the Omaha MSA Operated by DCHD

Site Name: 30th & Fort - Omaha	AIRS ID: 31-055-0035
Location: 30th & Fort Sts., Omaha	Latitude: 41.306111º Longitude: -95.960278º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Ozone (O_3)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49C	EPA Method: EQOA-0880-047
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 5/1/81	Closure Date: 11/1/14
Data used for NAAQS comparison: NA (not operating)	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: NA (site permanently closed) (1)	
Comment:	
(1) This site was closed due to demolition/construction activity. The monitor was re-located to 1616 Whitmore St in 2015. Because the future availability of the 30th & Fort St site was in doubt, NDEQ recommended permanent relocation of the monitor to 1616 Whitmore St. Relocation was approved by EPA Region 7 in December 2018.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

Combined Ozone & PM_{10} Site in the Omaha MSA Operated by DCHD

Site Name: South Omaha – Ozone	AIRS ID: 31-055-0028
Location: 2411 O Street, Omaha	Latitude: 41.207500º Longitude: -95.947500º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Ozone (O_3)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 49C	EPA Method: EQOA-0880-047
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 7/1/78	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 6/1/06 (1)	Closure Date: Currently operating
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comment:	
The PM_{10} sampler was initially set-up as a SPAM at 25th & L Sts and then moved to 2411 O St on 8/22/07.	

PM_{10} Sites in the Omaha MSA Operated by DCHD

Site Name: 19th & Burt, Omaha	AIRS ID: 31-055-0054
Location: 19th & Burt Sts., Omaha	Latitude: 41.267770º Longitude: -95.940830º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Middle
Start-Up Date: 6/1/01	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days (1)
Analyzer/Sampler: Hi-Vol Filter	EPA Method: RFPS 1287-063
Purpose: Population & Source Oriented	Scale: Middle
Start-Up Date: 6/1/01	Closure Date: Currently operating
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

PM_{10} sites continued on next page

Appendix A: Ambient Air Monitoring Sites in Nebraska

Permanently Closed(1) PM_{10} Site in the Omaha MSA Operated by DCHD

Site Name: 46th & Farnam, Omaha	AIRS ID: 31-055-0045
Location: 46th & Farnam Sts, Omaha	Latitude: 41.257500º Longitude: -95.976111º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo FH 62 C14	EPA Method: EQPM-1102-150
Purpose: Source Oriented	Scale: Middle
Start-Up Date: 1/1/93 (1)	Closure Date: 3/22/18
Data used for NAAQS comparison: NA (not operating)	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: NA (site closed)	
Comments:	
(1) This site utilized a Hi-Vol sampler on a once every 6 day sampling schedule until 1/1/08, when a continuous sampler was installed. This site was source-oriented to Omaha Steel Castings, which relocated to Wahoo, NE and closed the Omaha facility in 2014. DCHD continued monitoring during site closure and redevelopment. This monitor suffered an equipment malfunction on 3/22/18, and DCHD recommends permanent closure, with concurrence from NDEQ. Closure approved by EPA Region 7 in December 2018.	

$PM_{2.5}$ Sites in the Omaha MSA Operated by DCHD

Site Name: Berry Street Omaha	AIRS ID: 31-055-0052
Location: 9225 Berry Street, Omaha	Latitude: 41.333056º Longitude: -96.099722º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: 2025 Sequential	EPA Method: RFPS-0498-118
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 1/1/99	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: 2025 Sequential	EPA Method: RFPS-0498-118
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 10/1/14	Closure Date: Currently operating
Data used for NAAQS comparison: Only when there is no primary data	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Appendix A: Ambient Air Monitoring Sites in Nebraska

$PM_{2.5}$ Sites in the Omaha MSA Operated by DCHD - continued

Site Name: Bellevue	AIRS ID: 31-153-0007
Location: 2912 Coffey Ave., Bellevue	Latitude: 41.166944º Longitude: -95.923889º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020 (1)	EPA Method: EQPM-0308-170
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 3/1/99	Closure Date: Currently operating
Data used for NAAQS comparison: Yes Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: (1) This site was operated with a 2025 sequential sampler from 3/1/99 thru 6/30/10 (RFPS-0498-118). On 7/1/10 a Met One BAM monitor began operating.	

Site Name: Blair	AIRS ID: 31-177-0002
Location: 2242 Wright St., Blair	Latitude: 41.551136º Longitude: -96.146753
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: 2025 Sequential	EPA Method: RFPS-0498-118
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 4/6/09	Closure Date: Currently operating
Data used for NAAQS comparison: Yes Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Sulfur Dioxide Site in the Omaha MSA Operated by DCHD

Site Name: OPPD North Omaha Station	AIRS ID: 31-055-0057
Location: 7288 John Pershing Drive	Latitude: 41.325579º Longitude: -95.946297º
Operating Agency: Douglas County Health Department	
Monitor Information	**Pollutant: Sulfur Dioxide (SO_2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Thermo 43i	EPA Method: EQSA-0486-060
Purpose: Population & Source Oriented	Scale: Microscale
Start-Up Date: 01/01/17	Closure Date: Currently operating
Data used for NAAQS comparison: Yes Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, Appendix B not applicable	
Comments: This site was established to satisfy requirements of the Data Requirements Rule (DRR) in 40 CFR Part 51	

PM_{10} Site in the Weeping Water Area* Operated by NDEQ

* The Weeping Water Area is in Cass County, which is part of the Omaha MSA. This is a relatively non-urbanized area of the county with limestone mining and processing activities. The PM_{10} monitoring conducted here is for evaluation of air quality in the vicinity of Weeping Water, and not the Omaha MSA as a whole.

Site Name: Weeping Water City (1)	AIRS ID: 31-025-0002
Location: 102 P Street, Weeping Water	Latitude: 40.866228 Longitude: -96.137678
Operating Agency: Nebraska Department of Environmental Quality	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM (2)	EPA Method: EQPM-0798-122
Purpose: Population & Source Oriented	Scale: Neighborhood
Start-Up Date: 01/01/85	Closure Date: Currently operating
Data used for NAAQS comparison: Yes Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes. See Section V.A.1.a. App B not applicable	

Comments:

(1) Site is located at the city waste water treatment facility.

(2) This site was operated with a primary 2025 sequential monitor from 8/12/2004 to 9/30/2016. A MetOne BAM continuous monitor began operating on 10/1/2016. A collocated 2025 sequential monitor at the site suffered a major electronic breakdown and last sampled on 3/25/15. With the installation of the continuous monitor, collocation is no longer required.

Permanently Closed(1) PM_{10} Site in the Omaha MSA Operated by NDEQ

Site Name: Weeping Water Farm	AIRS ID: 31-025-0009
Location: 5102 Hwy 50, Cass Co.	Latitude: 40.873309º Longitude: -96.183359º
Operating Agency: Nebraska Department of Environmental Quality	
Monitor Information	**Pollutant: PM_{10}**
Type/POC: Primary Continuous / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: R&P TEOM	EPA Method: RFPS 1090-079
Purpose: Source Oriented	Scale: Neighborhood
Start-Up Date: 4/8/05	Closure Date: 2/21/18
Data used for NAAQS comparison: NA (not operating) Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, Appendix B not applicable	

Comments:

(1) Site closed at the request of the landowner. NDEQ's recommendation for permanent closure was approved by EPA Region 7 in December 2018.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Sites in the Lincoln MSA Operated by LLCHD

Site Name: Davey	AIRS ID: 31-109-0016
Location: 1st & Maple Sts., Davey	Latitude: 40.984722º Longitude: -96.677222º
Operating Agency: Lincoln Lancaster County Health Department	
Monitor Information	**Pollutant: Ozone**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Teledyne API 400E	EPA Method: EQOA-0992-087
Purpose: Population Oriented	Scale: Urban
Start-Up Date: 1/1/85	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: This site was upgraded at the beginning of the 2014 ozone season with the Teledyne API 400E analyzer replacing the Dasibi 1003 AH analyzer.	

Site Name: LLCHD Building	AIRS ID: 31-109-0022
Location: 3140 N St., Lincoln	Latitude: 40.812590º Longitude: -96.683020º
Operating Agency: Lincoln Lancaster County Health Department	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: R&P 2025 Seq. Filter	EPA Method: RFPS 0498-118
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 1/1/99	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: R&P 2025 Seq. Filter	EPA Method: RFPS 0498-118
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 1/1/99	Closure Date: Currently operating
Data used for NAAQS comparison: Only when primary data is not available.	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Continuous / POC 03(1)	Monitoring Frequency: Continuous
Analyzer/Sampler: Met One BAM-1020	EPA Method: EQPM-0308-170
Purpose: Population Oriented	Scale: Neighborhood
Start-Up Date: 7/1/06	Closure Date: Currently operating
Data used for NAAQS comparison: No. Reports to AirNow, but not AQS (1)	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comment:

(1) The MetOne BAM monitor reported data to AirNow , but not AQS. Data from the MetOne BAM is not used for NAAQS comparison. The MetOne BAM data typically demonstrates a positive bias when compared to same day FRM data. In 2015, there was a 39% bias on same-day annual average data, and a 17% positive bias for the same-day 98th percentile.

Sites in the Lincoln MSA Operated by LLCHD - continued

Site Name: Sheldon Station	AIRS ID: 31-109-0025
Location: SW 42nd St ~0.2 mi N of W Pella Rd	Latitude: 40.554722º Longitude: -96.780278º
Operating Agency: Lincoln-Lancaster County Health Department	
Monitor Information	**Pollutant: Sulfur Dioxide (SO_2)**
Type/POC: Primary / POC 01	Monitoring Frequency: Continuous
Analyzer/Sampler: Teledyne API T100	EPA Method: EQSA-0495-100
Purpose: Highest Concentration	Scale: Microscale
Start-Up Date: 12/23/16	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: This site was established to satisfy requirements of the Data Requirements Rule (DRR) in 40 CFR Part 51	

$PM_{2.5}$ Sites Operated by NDEQ

Site Name: Grand Island Senior High	AIRS ID: 31-079-0004
Location: 2124 N Lafayette Ave, Grand Island	Latitude: 40.942099º Longitude: -98.364967º
Operating Agency: Nebraska Department of Environmental Quality	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary FRM/ POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: Thermo 2025i Sequential	EPA Method: RFPS-0498-118
Purpose: Transport & Population Oriented	Scale: Regional & Neighborhood
Start-Up Date: 5/7/04	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: None	

Site Name: Scottsbluff Senior High School	AIRS ID: 31-157-0004
Location: Hwy 26 & 5th Ave, Scottsbluff (1)	Latitude: 41.87609º Longitude: -103.6587º
Operating Agency: Nebraska Department of Environmental Quality	
Monitor Information	**Pollutant: $PM_{2.5}$**
Type/POC: Primary FRM/ POC 01	Monitoring Frequency: Once every 3 days
Analyzer/Sampler: Thermo 2025i Sequential	EPA Method: RFPS-0498-118
Purpose: Background & Population Oriented	Scale: Regional & Neighborhood
Start-Up Date: 5/13/09	Closure Date: Currently operating
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Comments: (1) The sampler was moved ~170 m W-SW on 4/15/16 (1st sample date at new location). The move was necessitated by re-construction of athletic fields and at the request of the school. The site ID # was retained. The new site uses standard 110 v AC line power, as the solar and wind power supply used at the old location was not retained.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

Temporarily Closed Source-Oriented Lead (Pb) Sites Operated by NDEQ

Site Name: Fremont	AIRS ID: 31-053-0005
Location: 1255 Front St., Fremont, NE	Latitude: 41.90583º Longitude: -97.31583º
Operating Agency: Nebraska Department of Environmental Quality	
Monitor Information	**Pollutant: Lead (Pb)**
Type/POC: Primary / POC 01	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol TSP-Pb (ICP-MS)	EPA Method: EQL-0310-189
Purpose: Source-Oriented (1)	Scale: Micro-scale
Start-Up Date: 3/9/10	Closure Date: 9/31/2018
Data used for NAAQS comparison: Yes	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	
Monitor Information	**Pollutant: Lead (Pb)**
Type/POC: Collocated / POC 02	Monitoring Frequency: Once every 6 days
Analyzer/Sampler: Hi-Vol TSP-Pb (ICP-MS)	EPA Method: EQL-0310-189
Purpose: Source Oriented	Scale: Micro-scale
Start-Up Date: 3/9/10	Closure Date: 9/31/2018
Data used for NAAQS comparison: Only if primary sampler data is not available	
Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Yes, App B not applicable	

Comments:
(1) Source-oriented with respect to Magnus Farley. Site closed at the request of the landowner. Several nearby alternative sites are currently being evaluated.

Source-Oriented Lead Monitoring Waivers pursuant to 40 CFR Part 58 Section 4.5(ii)

(1) Nucor Steel in Norfolk, NE: Waiver approved by the EPA R7 Administrator in April 2014 and is effective through April 2019, unless revoked or extended. Renewal of the waiver is requested in section V-A-2 of this document, with supporting modeling analysis presented in Appendix D.

Appendix A: Ambient Air Monitoring Sites in Nebraska

Interagency Monitoring of Protected Visual Environments (IMPROVE) Sites *

* Interagency Monitoring of Protected Visual Environments (IMPROVE) monitors are operated to evaluate regional haze that may impact Federal Class I areas in National Parks and Wilderness Areas. Fine particulate and particulate speciation monitoring is conducted at these sites. They do not have an AIRS ID, are not subject to 40 CFR Part 58 requirements, and are not used for NAAQS attainment determinations.

Site Name: NE National Forest IMPROVE **Location: Nebraska National Forest, Thomas Co.**	AIRS ID: Not applicable, See Comments Latitude: 41.8888º Longitude: -100.3387º
Operating Agency: Nebraska Department of Environmental Quality / US Forest Service	
Monitor Information Type/POC: IMPROVE Method Description: : IMPROVE Purpose: Background & Transport Start-Up Date: 2002	**Pollutant: IMPROVE** (See Comments) Monitoring Frequency: Continuous EPA Method: Not applicable Scale: Regional Closure Date: Currently operating
Data used for NAAQS comparison: Not applicable. Meets applicable provisions of 40 CFR Part 58 Appendixes A thru E: Not applicable	
Comments: None	

National Atmospheric Deposition Program (NADP) Sites**

** The NADP site information below is included in the Network Plan for informational purposes only. They are not subject to 40 CFR Part 58 requirements, nor used for NAAQS attainment determinations.

Site Name: Mead NADP **Location: U of NE Field Lab, Saunders Co.** Operating Agency: University of Nebraska	AIRS ID: Not applicable, See Comments Latitude: 41.1528º Longitude: -96.4912
Monitor Information Type/POC: NTN/MDN Method Description: NTN/MDN Purpose: Background & Transport Start-Up Date: 7/25/78	**Pollutant: TNT/MDN** Monitoring Frequency: Continuous EPA Method: Not applicable Scale: Regional Closure Date: Currently operating
Comments: The Mead and North Platte National Atmospheric Deposition Program (NADP) sites are operated by the University of Nebraska with analytical and data processing support from the NADP. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only. • Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM). • The National Trends Network (NTN) sites collect deposition data on acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., calcium, magnesium, potassium and sodium). • Mercury Deposition Network (MDN) sites collect mercury deposition data. • The NADP oversees both NTN and MDN sites, and provides analytical and data processing support. • The Mead site initiated operation as an NTN site in 1978 and began MDN operations in June 2007. NDEQ provides financial support for MDN operations at this site through Title V fees.	

Appendix A: Ambient Air Monitoring Sites in Nebraska

National Atmospheric Deposition Program (NADP) Sites (continued)

Site Name: North Platte NADP **Location: U of Ne Ag Station, Lincoln, Co.** Operating Agency: University of Nebraska	AIRS ID: Not applicable, See Comments Latitude: 41.0592º Longitude: -100.7464º
Monitor Information Type/POC: NTN Method Description: NTN Purpose: Background & Transport Start-Up Date: 9/24/85	**Pollutant:** NTN Monitoring Frequency: Continuous EPA Method: Not applicable Scale: Regional Closure Date: Currently operating

Comments: The Mead and North Platte National Atmospheric Deposition Program (NADP) sites are operated by the University of Nebraska with analytical and data processing support from the NADP. NADP sites are not subject to review under the provisions of 40 CFR Part 58.10, and thus are not subject to review under this Network Plan. They are included herein for informational purposes only.

- Monitoring methods are specific to this program and are not Federal Reference or Equivalent Methods (FRM/FEM).
- The National Trends Network (NTN) sites collect deposition data on acidity, sulfate, nitrate, ammonium, chloride, and base cations (e.g., calcium, magnesium, potassium and sodium).
- Mercury Deposition Network (MDN) data was collected at this site from October 2009 thru October 2011 using Nebraska Environmental Trust funding.
- The NADP oversees both NTN and MDN sites, and provides analytical and data processing support.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

This appendix compares ambient air quality data from 2016 through 2018 to the NAAQS. The annual data and estimated Design Values (DVs) presented below were retrieved from the EPA AQS database.

Table B-1. Ozone Data

Comparison of 3-Year Design Values for 8-hour Ozone to NAAQS (1)						
Site	**Operator**	**2016**	**2017**	**2018**	**DV**	**% NAAQS**
Omaha MSA and Near-By Montgomery Co., IA (4)						
Omaha NCore	DCHD	0.062	0.062	0.069	0.064	91%
2411 O St., Omaha	DCHD	0.063	0.061	0.063	0.062	89%
1616 Whitmore St, Omaha	DCHD	0.063	0.064	0.066	0.064	91%
Pisgah, Harrison Co., IA	IA DNR	0.063	0.064	0.066	0.064	91%
Montgomery County, IA (2)	IA DNR	0.062	0.059	0.064	0.061	87%
Lincoln MSA						
First & Maple, Davey	LLCHD	0.058	0.062	0.062	0.060	86%
Sioux City MSA						
31986 475th Ave, Union Co, SD	SD DEP	0.060	0.066	0.068	0.064	91%
Nebraska Non-MSA						
Santee Indian Reservation	US EPA	0.064	0.067	0.065	0.065	93%
Sites in Surrounding States						
Emmetsburg, IA	IA DNR	0.062	0.061	0.067	0.063	90%
Des Moines, IA	IA DMR	0.061	0.060	0.065	0.062	89%
Savanah, MO	MO DNR	0.062	0.062	0.067	0.063	90%
Kansas City Metro (Max DV site)	MO DNR	0.069	0.070	0.072	0.070	100%
Topeka KS	KS DHE	0.063	0.062	0.062	0.062	89%
Cedar Bluff Reservoir, KS	KS DHE	0.058	0.062	0.064	0.061	87%
Denver, CO Metro (Max DV site)	CO DPHE	0.078	0.074	0.083	0.078	111%
Greeley, CO	CO DPHE	0.067	0.072	0.073	0.070	100%
Cheyenne, WY (Max DV site)	WY DEQ	0.061	0.065	0.068	0.064	91%
Newcastle, WY	WY BLM	0.060	0.062	0.063	0.061	87%
Sioux Falls, SD	SD DEP	0.066	0.066	0.069	0.067	96%
Wind Cave NP, Custer Co., SD	SD DEP	0.060	0.065	0.063	0.062	89%
Badlands NP, Jackson Co., SD	SD DEP	0.060	0.067	0.063	0.063	90%

Notes and Explanations:

(1) EPA AQS data retrieval 4/17/19. Concentrations are in units of ppm. Annual values are the 4th highest daily maximum 8-hour concentrations (ppm). The Design Value (DV) is the truncated 3-year average of the 4th highest max for each year. The NAAQS = 0.070 ppm (promulgated 10/1/2015).

(2) The Montgomery County, IA site is located outside the Omaha MSA at Viking Lake State Park;~18 miles east of the Mills-Montgomery County line and ~ 45 miles SE of the I-29/I-80 intersection.

Table B-2. Carbon Monoxide Data

Comparison of 3-Year Maximum Value for 1-Hour Carbon Monoxide to NAAQS (1) (2)					
Site	**2016**	**2017**	**2018**	**Design Value (2)**	**% NAAQS**
Omaha MSA					
78th & Dodge Sts, Omaha	1.8	2.0	1.7	2.0	6%
Omaha NCore (4)	0.74	1.31	1.01	1.31	4%
Comparison of 3-Year Maximum Value for 8-Hour Carbon Monoxide to NAAQS (1) (3)					
Site	**2016**	**2017**	**2018**	**Design Value (3)**	**% NAAQS**
Omaha MSA					
78th & Dodge Sts., Omaha	1.5	1.5	1.3	1.5	17%
Omaha NCore (4)	0.5	1.0	0.7	1.0	11%

Notes and Explanations:

(1) EPA AQS data retrieval 4/16/19. The CO NAAQS were last revised in 1984. The latest review was concluded in August 2011 when EPA determined no changes in the CO NAAQS were warranted.

(2) The 1-hour NAAQS = 35 ppm. The Design Value is the highest annual 2nd highest maximum value over the last 3 years. The annual values shown are the annual 2nd highest maximum values. Concentrations are in units of ppm.

(3) The 8-hour NAAQS = 9 ppm. The Design Value is the highest annual 2nd highest maximum value over the last 3 years. The annual values shown are the 2nd highest 8-hour maximum values. Concentrations are in units of ppm.

(4) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-3. Sulfur Dioxide Data

Comparison of Daily Maximum 1-Hour Sulfur Dioxide Levels to the Primary NAAQS (1)					
Site	**2016**	**2017**	**2018**	**Design Value (1)**	**% NAAQS**
Omaha MSA					
1616 Whitmore St., Omaha	0.065	0.055	0.029	0.050	67%
Omaha NCore (2)	0.024	0.046	0.017	0.029	38%
7288 John Pershing Dr., Omaha(3)	nd	0.036	0.037	0.036	48%
Lincoln MSA					
SW 42nd St., Lancaster Co.(4)	nd	0.044	0.010	0.027	36%
Sioux City MSA Sites					
31986 475th Ave, Union Co, SD (5)	0.003	0.004	0.003	0.004	5%

Notes and Explanations:

(1) EPA AQS data retrieval 4/16/19. The 1-hour NAAQS is 75 ppb or 0.075 ppm (promulgated in June 2010 and retained in March 2019). The annual values shown are the 99th percentile of the daily maximum values in ppm units. The Design Value is the three-year average of the annual 99th percentile daily maximum values. This NAAQS was promulgated on June 22, 2010. Values from monitors with less than 3 years of data are shown in red.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The 7288 John Pershing Dr. site began operation on 01/01/17 and is operated by DCHD. This site adjacent to the OPPD North Omaha Generating Station was established to satisfy the requirements of the Data Requirements Rule (DRR) in 40 CFR Part 51.

(4) The SW 42nd St., Lancaster County site began operation on 12/23/16 and is operated by LLCHD. This site adjacent to the NPPD Sheldon Generating Station was established to satisfy the requirements of the Data Requirements Rule (DRR) in 40 CFR Part 51.

(5) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-4a. Nitrogen Dioxide Data

Comparison of 1-Hour Maximum Levels of Nitrogen Dioxide to NAAQS (1)(2)					
Site	**2016**	**2017**	**2018**	**Design Value (2)**	**% NAAQS**
Sioux City MSA					
31986 475th Ave, Union Co, SD (4)	0.016	0.015	0.018	0.016	16%
Comparison of 3-Year Maximum Annual Average Value for Nitrogen Dioxide to NAAQS(3)					
Site	**2016**	**2017**	**2018**	**Design Value (3)**	**% NAAQS**
Sioux City MSA					
31986 475th Ave, Union Co, SD (4)	0.002	0.002	0.002	0.002	4%

Notes and Explanations:

(1) EPA AQS data retrieval 4/17/19. All concentrations expressed in ppm units.

(2) The 1-hour NO_2 NAAQS is 0.100 ppm (promulgated Feb. 2010 and retained Apr. 2018). NAAQS attainment is achieved if the 3-year average of the annual 98th percentile of the daily maximum 1-hour values does not exceed 0.100 ppm.

(3) The Annual Average NO_2 NAAQS is 0.053 ppm not to be exceeded in a calendar year. It was promulgated in 1971, and retained in the 1996 and 2010 reviews. The Design Value is the highest annual average over the 3-year comparison period.

(4) The Union Co., SD sites are operated by the South Dakota Department of Environment & Natural Resources

Table B-4b: Nitrogen Oxide Data from the Omaha NCore Site (1)(2)

Parameter	**2016**	**2017**	**2018**	**Approx. DV (3)**	**Max % NAAQS**
1-Hour Data: 98th Percentile					
NOy-NO (3)(4)(5)	0.0336	0.037	0.038	0.036	36%
Annual Average Data					
NOy-NO	0.0058	0.0059	0.0060	0.0059	11%

Footnotes:

(1) EPA AQS data retrieval 4/17/19. All concentrations expressed in ppm units.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) NOy – Reactive oxides of nitrogen, which includes NO, NO_2 and other nitrogen oxides, including organic nitrogen oxide compounds.

(4) NO – Nitrogen oxide

(5) NOy-NO provides an approximation of nitrogen dioxide (NO_2), with some possibility of over-estimating the true NO_2 concentration. For this reason, the NOy-NO parameter can be used to demonstrate attainment, but not non-attainment.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5a. PM_{10} – Annual Number of Exceedances (1) (2)

Site	2016	2017	2018	Design Value (1)
Omaha MSA Sites (6)				
Omaha NCore, 4102 Woolworth St. (3)	0.0	0.0	0.0	0.0
2411 O St, Omaha	0.0	0.0	0.0	0.0
19th & Burt Sts, Omaha	0.0	0.0	0.0	0.0
3130 C Ave, Council Bluffs, IA (4)	0.0	0.0	0.0	0.0
Weeping Water City (5)	0.0	0.0	0.0	0.0
Sioux City MSA Site				
31986 475th Ave, Union Co, SD (6)	0.0	0.0	0.0	0.0

Notes and Explanations:

(1) EPA AQS data retrieval 4/19/19. The PM10 NAAQS is an exceedance-based standard with a 24-hour averaging time and 150 *u*g/m3 level, not to be exceeded more than once per year on average over 3 years, where exceedence is defined as a value of 155 *u*g/m3 or more. Sites with 3-year average of exceedances of 1.0 or less are in attainment with the NAAQS. Concentrations are in units of µg/m^3at standard temperature (25º C) and pressure (760 mm Hg) conditions.

(2) NAAQS History: The primary 24-hour NAAQS was initially set at 150 *u*g/m3 in 1987, and was retained at this level in the 1997, 2006 and 2012 PM NAAQS reviews.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The Council Bluffs, IA site is operated by the IA DNR

(5) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(6) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5b. PM_{10} – Annual Maximum 24-Hour Data (1) (2)

Site	2016	2017	2018	4th Highest Value(1)	% NAAQS
Omaha MSA Sites(6)					
Omaha NCore, 4102 Woolworth St. (3)	81	63	64	63	42%
2411 O St, Omaha	50	47	55	49	33%
19th & Burt Sts, Omaha	43	51	55	43	29%
3130 C Ave, Council Bluffs, IA (4)	53	64	83	57	38%
Weeping Water City (5)	51	67	67	62	41%
Sioux City MSA Site					
31986 475th Ave, Union Co, SD (6)	61	52	131	84	56%

Notes and Explanations:

(1) EPA AQS data retrieval 4/19/19. Year columns show annual maximum 24-hour average values of PM_{10}. NAAQS = 150 *u*g/m3, not to be exceeded more than once per year on average over 3 years, where exceedence is defined as a value of 155 *u*g/m3 or more. The 4th-highest 24-hour average value in the three-year period is shown for informal comparison to the NAAQS.

(2) NAAQS History: The primary 24-hour NAAQS was initially set at 150 *u*g/m3 in 1987, and was retained at this level in the 1997, 2006 and 2012 PM NAAQS reviews.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The Council Bluffs, IA site is operated by the IA DNR

(5) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(6) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-5c. PM_{10} - Annual Average Data (1)

Site	2016	2017	2018	3-Year Average	% Old Std
Omaha MSA (4)					
Omaha NCore, 4102 Woolworth St. (2)	21.2	21.7	18.6	20.5	41%
2411 O St, Omaha	24.2	22.4	23.1	23.2	46%
19th & Burt Sts, Omaha	21.5	20.6	20.9	21.0	42%
3130 C Ave, Council Bluffs, IA (3)	20.2	21.1	21.5	20.9	42%
Weeping Water City (4)	19.5	20.0	17.3	18.9	38%
Sioux City MSA					
31986 475th Ave, Union Co, SD (5)	16.5	15.2	18.3	16.7	33%

Notes and Explanations:

(1) EPA AQS data retrieval 4/22/19. There is currently no NAAQS for the annual average PM_{10} concentration. An annual average NAAQS of 50 $\mu g/m^3$ was established in 1987, and then rescinded on December 18, 2006. Comparison to the rescinded NAAQS is provided for informational purposes only. Concentrations are in units of $\mu g/m^3$. Values from monitors with less than 3 years of data are shown in red.

(2) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(3) The Council Bluffs IA site is operated by the IA DNR

(4) Weeping Water is a limestone mining and processing area in Cass County, which is located 15 to 20 miles south of the main urbanized area within the Omaha MSA.

(5) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-6a. $PM_{2.5}$ - 98th Percentile 24-Hour Data (1) (2)

Site	2016	2017	2018	Design Value (1)	% NAAQS
Omaha MSA & Montgomery Co., IA (5)					
Omaha NCore (3)	18.1	21.0	19.5	20	56%
9225 Berry St.; Omaha	15.0	16.5	22.0	18	51%
2912 Coffey Ave., Bellevue	16.2	19.2	21.2	19	54%
2242 Wright St., Blair	14.0	15.9	20.8	17	48%
3130 C Ave., Council Bluffs, IA (4)	17.0	18.8	22.0	19	55%
Montgomery Co., IA (outside Omaha MSA) (4) (5)	15.5	14.3	18.5	18	52%
Lincoln MSA					
3140 N Street, Lincoln	16.0	19.2	19.2	17	48%
Sioux City MSA					
901 Floyd Blvd, Sioux City, IA (4)	15.4	18.7	20.0	18	52%
31986 475th Ave, Union Co, SD (6)	17.3	14.5	15.5	16	45%
Other Nebraska Sites					
Grand Island Senior High	12.2	14.7	18.6	15	43%
Scottsbluff (7)	14.6	24.1	17.6	19	54%

Notes and Explanations:

(1) EPA AQS data retrieval 4/22/19. The Design Values are the 3-year average of the annual 98th percentile values. To determine attainment status, the Design Values are compared to the 35 μg/m^3 NAAQS. Concentrations are in units of μg/m^3.

(2) NAAQS History: The 24-hour $PM_{2.5}$ NAAQS was initially established at 65μg/m^3 in 1997. It was lowered to 35 mg/m^3 in 2006 and retained at the 35 μg/m^3 level in 2012.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The Council Bluffs, Montgomery Co., and Sioux City IA sites are operated by the IA DNR

(5) The Montgomery County, IA site is located outside the Omaha MSA at Viking Lake State Park, ~18 miles east of the Mills-Montgomery County line and ~ 45 miles SE of the I-29/I-80 intersection.

(6) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources

(7) Scottsbluff Design Value Not Valid due to Incomplete Data:
Q1-2016 = 32%, Q2-2016 = 73%, CY2016 = 71%. Data loss issues were associated with power losses and monitor malfunctions.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-6b. $PM_{2.5}$ - Annual Average Data (1) (2)

Site	2016	2017	2018	Design Value (1)	% NAAQS
Omaha MSA & Montgomery Co., IA (4)					
Omaha NCore (3)	8.0	9.6	8.3	8.6	72%
9225 Berry St.; Omaha	6.4	7.0	8.0	7.1	59%
2912 Coffey Ave., Bellevue	7.9	9.7	9.1	8.9	74%
2242 Wright St., Blair	6.4	6.7	7.6	6.9	58%
3130 C Ave., Council Bluffs, IA (4)	7.2	7.7	8.8	7.9	66%
Montgomery Co., IA (outside Omaha MSA) (4) (5)	6.1	6.4	6.4	6.5	54%
Lincoln MSA					
3140 N Street, Lincoln	6.1	6.7	7.1	6.6	55%
Sioux City MSA					
901 Floyd Blvd, Sioux City, IA (4)	7.3	7.6	8.3	7.7	64%
31986 475th Ave, Union Co, SD (6)	5.8	6.4	6.4	6.2	51%
Other Nebraska Sites					
Grand Island Senior High	5.4	6.0	6.2	5.9	49%
Scottsbluff (7)	4.9	7.6	6.3	6.3	52%

Notes and Explanations:

(1) EPA AQS data retrieval 4/22/19. The Design Values are the 3 year average of the annual average values. To determine attainment status, the Design Values are compared to the 12 μg/m^3 NAAQS. Concentrations are in units of μg/m^3.

(2) NAAQS History: The annual average $PM_{2.5}$ NAAQS was initially established in 1997 at15μg/m^3. It was retained at this level in the 2006 review and then lowered to 12 μg/m^3 in December 2012.

(3) Omaha NCore is a multi-pollutant monitoring site located at 4102 Woolworth Street.

(4) The Council Bluffs, Montgomery Co., and Sioux City IA sites are operated by the IA DNR

(5) The Montgomery County, IA site is located outside the Omaha MSA at Viking Lake State Park, ~18 miles east of the Mills-Montgomery County line and ~ 45 miles SE of the I-29/I-80 intersection.

(6) The Union Co., SD site is operated by the South Dakota Department of Environment & Natural Resources

(7) Scottsbluff Design Value Not Valid due to Incomplete Data:
Q1-2016 = 32%, Q2-2016 = 73%, CY2016 = 71%. Data loss issues were associated with power losses and monitor malfunctions.

Appendix B: Comparison of Ambient Air Monitoring Data to NAAQS

Table B-7. Lead in Total Suspended Particulate (TSP-Pb)

Annual Maximum Rolling 3-Month Average Values (1) (2)					
Site	**2016**	**2017**	**2018**	**DV** (1)	**% NAAQS**
Fremont	0.061	0.042	0.024	0.061	41%
Omaha NCore (3)	0.003	0.003	nd	0.003	2%

Notes and Explanations:

(1) Concentrations are in units of $\mu g/m^3$. The 3-month average NAAQS = 0.15 $\mu g/m^3$. The DV or Design Value is the highest 3 month average in the last 3 years. Values from monitors with less than 3 years of data are shown in red.

(2) NAAQS History: The initial NAAQS was promulgated in 1978 and was set at 1.5 $\mu g/m^3$ calendar quarter average. In 2008, it was modified to 0.15 $\mu g/m^3$ 3-month running average.

(3) Lead monitoring at the Omaha NCore site was discontinued as of December 31, 2017, as discussed in the 2018 Network Plan

Appendix C: Compliance Verification with 40 CFR Part 58

This appendix reviews compliance with applicable requirements in 40 CFR Part 58 Appendices A through E, including revisions effective 4/27/16. Nebraska Ambient Monitoring activities and network are in compliance with these requirements.

I. 40 CFR Part 58 Appendix A Review

40 CFR Part 58 Appendix A sets forth quality assurance requirements for the collection, calculation, and reporting of air monitoring data. The *Quality Assurance Project Plan (QAPP) for the Nebraska Ambient Air Monitoring Program for Criteria Pollutants, NCore Parameters, PM2.5 Speciation, and Total Reduced Sulfur* (EPA approved November 2014) was developed to comply with Part 58 requirements and the provisions of the EPA *Quality Assurance Handbook for Air Pollution Measurement Systems Volume II* (May 2013). The DCHD, LLCHD and NDEQ all use this QAPP. Actual procedures for operating monitors, as well as for collecting, reviewing and submitting data, are set forth in Standard Operating Procedures (SOPs) that comply with the QAPP.

40 CFR Part 58 Appendix A also sets forth requirements specifying the number of collocated monitors required for $PM_{2.5,}$ $PM_{10,}$ $PM_{10\text{-}2.5}$ and Lead (Pb) monitors. Table C-1 summarizes the collocated sites in Nebraska. All PM and Pb sub-networks operated by DCHD, LLCHD and NDEQ currently meet collocation requirements.

II. 40 CFR Part 58 Appendix C Review

40 CFR Part 58 Appendix C contains requirements for approved ambient air monitoring methodologies. Any monitor that is used to evaluate NAAQS compliance must be a Federal Reference Method (FRM) or a Federal Equivalent Method (FEM) or an alternatively approved method as defined in Appendix C. The network description tables in Appendix A of the network plan identify the monitoring method used by each monitor in the Nebraska ambient air monitoring network. All monitors used to evaluate compliance with the NAAQS are FRM or FEM certified. The only monitors that are not FRM/FEM certified are those not subject to 40 CFR Part 58 requirements; i.e., NADP, IMPROVE, RadNet, etc.

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-1. Compliance Summary: Collocation Requirements of Appendix A(1)

Parameter	Method	Percent Collocation Required	NDEQ/LLCHD (2)			DCHD (2)		
			# of Sites	# Collocated	% Collocated	# of Sites	# Collocated	% Collocated
PM_{10}	Hi-Vol Sampler	15%	0	0	na	2	1	50%
PM_{10}	Sequential 2025 Sampler	15%	0	0	na (3)	0	0	na
PM_{10}	Continuous Monitor	None	1	0	(4)	1	0	(4)
$PM_{2.5}$	Sequential 2025 Sampler	15%	3	1	33%	2	1	50%
$PM_{2.5}$	Met One BAM Method (5)	15%	1	1	100% (5)	2	1	50%
$PM_{10-2.5}$	Met One BAM Method	None	0	0	na	1	0	(6)
TSP-Lead	Hi-Vol Sampler	15% except NCore	1	1	100%	0	0	(7)

Footnotes:

(1) Collocation Requirements: Appendix A requires 15% of the sites in each parameter/method category to have collocated monitors with certain exceptions and additional requirements.

(2) Collocation requirements apply to each Primary Quality Assurance Organization (PQAO) separately. There are two PQAO's in Nebraska: DCHD and NDEQ/LLCHD.

(3) The Cozad and Gothenburg PM_{10} sites were closed in March 2016 and the Weeping Water primary monitor was replaced with a MetOne BAM continuous monitor in June 2016, for which no collocation is required.

(4) Collocated monitors are not required for continuous PM_{10} monitors.

(5) LLCHD operates a MetOne BAM $PM_{2.5}$ sampler for AirNow and AQI reporting. It is collocated with the primary and collocated sequential samplers at the site.

(6) DCHD operates 2 MetOne BAM samplers at the NCore site. One is set-up to sample $PM_{2.5}$ and the other samples PM_{10}. $PM_{10-2.5}$ is calculated using the results from these 2 samplers. There is a sequential $PM_{2.5}$ collocated sampler at the NCore site, but not a collocated PM_{10} sampler. Collocated PM_{10} samplers are not required in Appendix A for continuous PM_{10} samplers. EPA has designated some NCore sites to have collocated samplers for $PM_{10-2.5}$; the Omaha NCore site is not one of them.

(7) TSP-Lead monitoring at the Omaha NCore site was discontinued 12/31/2017.

Network Descriptions:	
NDEQ Continuous PM_{10}: Weeping Water City (collocation not required)	DCHD Hi-Vol PM_{10}: 19& Burt (collocated) and South Omaha
NDEQ TSP-Lead: Fremont (collocated)	DCHD Sequential 2025 $PM_{2.5}$: Berry St (collocated) & Blair
NDEQ & LLCHD Sequential 2025 $PM_{2.5}$: Lincoln (collocated), Grand island & Scottsbluff	DCHD MetOne BAM $PM_{2.5}$: NCore (collocated) & Bellevue
	DCHD MetOne BAM $PM_{10-2.5}$: NCore (collocation not required)

Appendix C: Compliance Verification with 40 CFR Part 58

III. 40 CFR Part 58 Appendix D Review

40 CFR Part 58 Appendix D sets forth monitoring objectives and minimum monitoring site requirements that must be met. The review that follows demonstrates that the Nebraska ambient air monitoring network meets the Appendix D requirements in effect on February 28, 2013.

EPA periodically re-evaluates the NAAQS and monitoring requirements. Regulatory modifications may impact the minimum monitoring requirements in one of two ways:

- Appendix D minimum monitoring requirements may be changed (i.e., more or less monitoring could be required); or
- Monitoring needs may change as a result of a NAAQS modification (e.g., when the annual average $PM_{2.5}$ NAAQS was lowered from 15 *u*g/m^3 to 12 *u*g/m^3, the 85% of NAAQS threshold set forth in 40 CFR Part 58 Appendix D Sec. 4.7 Table D.5 was crossed, and the minimum number of $PM_{2.5}$ monitoring sites for the Omaha MSA increased from 1 to 2).

III.A: 40 CFR Part 58 Appendix D - Objectives Review

40 CFR Part 58 Appendix D Section 1.1 sets forth 3 objectives that ambient air monitoring networks must be designed to meet:

- Provide air pollution data to the general public in a timely manner.
- Support compliance with ambient air quality standards and emissions strategy development.
- Support for air pollution research studies.

Each of these objectives is discussed below.

1. Timely Dissemination of Data - Met

Air monitoring data is made available to the public and other parties in several ways.

a. Ambient air monitoring data is reviewed quarterly and entered into the national EPA-operated AQS database. The AQS database is available to federal, state, and local monitoring agency personnel, as well as some other public agencies and researchers. AQS data cannot be directly accessed by the general public, but the NDEQ does respond to data requests.

b. Air Quality Index reporting is performed by DCHD and LLCHD for their respective jurisdictions. The AQI information is made available on their respective city websites.

c. Monitoring data from continuous particulate, ozone, and CO monitors in the Omaha and Lincoln MSAs report directly to the EPA AirNow system. The general public can access air quality index information on-line at www.airnow.gov.

2. Support compliance with ambient air quality standards and emissions strategy development – Met

The NDEQ reviews all of the data collected by DCHD, LLCHD, and NDEQ during the previous year as part of the annual data certification process, which is submitted to EPA by May 1st. At this time design values are calculated and compared with the NAAQS. This design value information is then incorporated into the annual Network Plan. The annual Network Plans discuss attainment/non-attainment status and monitoring strategies that may be related.

The NDEQ, DCHD, and LLCHD also perform data validation reviews at least once each quarter and in many instances monthly. Any potential non-attainment or near non-attainment circumstances will be recognized during these reviews. If such conditions are identified, efforts are made to ascertain the cause and to the extent possible bring about corrective action through regulatory and/or voluntary mechanisms.

An AirNow summary report for ozone and $PM_{2.5}$ is emailed daily to an NDEQ member. When elevated ozone or $PM_{2.5}$ levels are reported, this information is passed on to air quality managers at DCHD, LLCHD, and NDEQ.

The examples below illustrate how state and local air quality programs have recognized air quality issues and reacted to them.

a. In the fall of 2011, the 3-month average lead concentration at the Fremont site exceeded the NAAQS. EPA and Magnus Farley, the one known source, were notified. The data were discussed and presented to EPA for review. NDEQ and the source conducted an on-site review of the facility and potential emission sources.

   In 2012, NDEQ continued to calculate daily and 3-month average lead monitoring data as the data became available and disseminated this information to Magnus Farley. High daily lead levels in May thru early July brought the 3-month average within 93% of the NAAQS, and these lead levels were discussed with Magnus Farley. Lower lead levels were seen beginning in July and continuing thereafter. The impact of this information exchange with the source is difficult to evaluate, but it may have played an important role in facilitating the source in remaining diligent with their control efforts.

   The NDEQ continues to inform Magnus Farley of lead levels as the data become available. Lead levels have remained in attainment with the current DV at 41% of the NAAQS. See Appendix B Table B-7 for 2016-2018 maximum 3-month average data.

b. From September 2011 thru June 2012, the 46th & Farnam site recorded four (4) 24-hour average PM_{10} values greater than the 150 ug/m^3 standard. The 46th & Farnam site is source-oriented with respect to Omaha Steel Castings Company, and the company had initiated a move to a new location in Wahoo, NE.

   Douglas County Health Department notified Omaha Air Quality Control and Omaha Steel of the high values in a timely manner. Omaha Air Quality Control staff met with Omaha Steel to discuss potential PM_{10} sources and controls. Omaha Steel proceeded with process-handling and housekeeping changes intended to reduce PM_{10} emissions. These efforts were effective in reducing PM_{10} levels. Omaha Steel completed their move to their new facility in 2014 and closed the 46th & Farnam facility.

c. In the summer of 2012, Nebraska monitoring sites began reporting ozone levels above those seen in recent years. The NDEQ began using AirNow data to track the current 4th highest values for sites in and around Nebraska as the ozone season progressed. Although the 4th high values at 2 sites in the Omaha MSA exceeded 0.075 ppm 8-hour ozone NAAQS, the 3-year average design values did not exceed the NAAQS (i.e., the maximum unofficial 2010-2012 DVs = 0.069 ppm).

d. In the spring of 2014, 2016, and 2017, smoke from controlled grassland fires in the Flint Hills area of Kansas impacted Nebraska. AirNow data was used to track the degree and extent of the impact on ambient ozone and $PM_{2.5}$. At times, the impact from these controlled burns raised

ozone and $PM_{2.5}$ levels in Nebraska. Both DCHD and LLCHD issued air quality alerts related to these burns.

Beginning in early 2018, NDEQ engaged with stakeholders and key players to address the air quality impacts associated with prescribed fires in the Flint Hills. Roundtable meetings were held in February and June 2018 to discuss current trends, research, and options for collaboration and coordination to provide timely health advisories and notifications to the public. In addition to the local Nebraska air quality agencies, the group included representatives from EPA Region 7, Kansas Department of Health and Environment (KDHE), the National Weather Service, Lincoln Mayor's office, and the Nebraska Department of Health and Human Services (DHHS).

As a result of this effort, during the 2018 spring burn season KDHE provided NDEQ and local Nebraska air quality agencies with weekly summaries of burn activity in the Flint Hills, the resulting smoke impacts, and predictions of fire activity and impacts for the upcoming week. Working group conference calls were established to assess potential smoke impacts and to issue health advisories when needed. These advisories were relayed to relevant local health departments in Nebraska and disseminated to the public by DHHS. The Smoke Awareness web page on the NDEQ website has been expanded with additional information on spring burn activity and to provide access to smoke impact outlooks. These activities continued and were refined during the 2019 burn season, and additional stakeholders participated, including several Nebraska organizations that conduct prescribed burns and researchers from the University of Nebraska. Although favorable weather patterns during the 2018 and 2019 spring burn seasons resulted in minimal impacts on air quality in Nebraska from Flint Hills burning, the communication framework that has been established will be instrumental in addressing future smoke and air quality impacts and in providing timely communication to the public regarding those impacts and related health concerns.

3. Support for air pollution research studies – Met

The NDEQ, DCHD, and LLCHD operate the Nebraska SLAMS network in accordance with the monitor specifications, site placement, and QA requirements set forth in 40 CFR Part 50 and 58. EPA R7 provides oversight to ensure that regulatory requirements are met with respect to methodology and QA.

Data is reviewed quarterly before being submitted to EPA's AQS database. Once in AQS, the data is available for pollution research studies.

Near real-time data is also reported to the EPA AirNow data from the continuous PM, CO, and ozone monitors operating in the Omaha and Lincoln MSA. This data is also available for research purposes.

III.B: 40 CFR Part 58 Appendix D – Minimum Monitoring Site Requirements

Nebraska meets the minimum number of monitoring sites requirements set in 40 CFR Part 58 Appendix D. The minimum monitoring site requirements are set by Core Based Statistical Areas (CBSAs), which include Metropolitan Statistical Areas (MSAs) and Micropolitan Statistical Areas (MiSAs). The minimum monitoring site requirements for each of the four MSAs in Nebraska are examined separately and documented in Tables C-2.a through C-2.d below.

The review for non-MSA areas of the state was performed on a pollutant-specific basis. This review is documented in narrative form in Section III.C below.

Appendix C: Compliance Verification with 40 CFR Part 58

It should be noted that the number of monitoring sites required in a network generally needs to be greater than the minimum number required by Appendix D. This is stated in Appendix D Section 1.1.2: "… total number of monitoring sites that will serve the variety of data needs will be substantially higher than these minimum requirements provide…"

III.C: 40 CFR Part 58 Appendix D Minimum Monitoring Requirements for non-MSAs

NCore – (40 CFR Part 58 App. D Sec. 3) No sites required or operated.

At this time there is no requirement or plan to develop an NCore site in Nebraska, other than the current site in Omaha.

Ozone (O_3) – (40 CFR Part 58 App. D Sec. 4.1) No sites required or operated.

At this time there is no requirement or plan to deploy ozone monitoring sites outside of the MSAs.

Carbon Monoxide (CO) – (40 CFR Part 58 App. D Sec. 4.2) No sites required or operated.

At this time there is no requirement or plan to conduct CO monitoring outside the MSAs. Elevated CO levels are primarily associated with vehicle emissions and congested traffic areas. Highest levels would be anticipated in the Omaha and Lincoln MSAs. Highest concentration site monitoring in Lincoln and Omaha has consistently found CO levels well below the NAAQS. Thus, there is not a need for additional monitoring sites in less populated communities.

Nitrogen Dioxide (NO_2) – (40 CFR Part 58 App. D Sec. 4.3) No sites required or operated.

At this time there is no requirement or plan to conduct NO_2 monitoring outside the MSAs.

Sulfur Dioxide (SO_2) – (40 CFR Part 58 App. D Sec. 4.4) No sites required or operated .

There are no Part 58 requirements to operate SO_2 monitoring sites in non-MSA areas. However, pursuant to Part 51, Subpart BB, monitoring may be used to demonstrate attainment with the 1-hour SO_2 NAAQS. NDEQ has no current plans for SO_2 monitoring in non-MSA areas. In December 2016, LLCHD began operating a source-oriented SO_2 monitor adjacent to Nebraska Public Power District's Sheldon Station near Hallam, NE in the Lincoln MSA. In January 2017, DCHD began operating a source-oriented SO_2 monitor adjacent to Omaha Public Power District's North Omaha Station in the Omaha MSA.

Lead (Pb) – (40 CFR Part 58 App. D Sec. 4.5)

Two source-oriented sites required; 1 operating and 1 waived.

40 CFR Part 58 Appendix D requires source-oriented monitoring near sources with lead emissions of 0.5 tpy or more. Three sources initially met this threshold: Magnus Farley in Fremont, Magnolia Metals in Auburn, and Nucor Steel in Norfolk.

Monitoring near Magnus Farley in Fremont and Magnolia Metals in Auburn was initiated in 2010. A waiver pursuant to Part 58 Appendix D Section 4.5 was sought from and granted by EPA R7 for Nucor Steel in Norfolk in April 2014. This waiver expires in April 2019; renewal is proposed elsewhere in this plan.

In 2012 and 2013 Magnolia Metals installed pollution-control equipment that reduced their lead emissions to 0.1 tpy. Ambient lead levels dropped to below 5% of the NAAQS in 2015. The 2015 Network Plan included a proposal for no longer requiring lead monitoring near Magnolia

Metals. The Auburn lead site was shut down in June 2016 in accordance with the 2015 Network Plan.

Thus only one source-oriented lead monitor, the one in Fremont, is currently required. This monitor ceased operating in September 2018 at the request of the site host. Several nearby alternative sites are currently being evaluated.

PM_{10} Particulate Matter (40 CFR Part 58 App. D Sec. 4.6) No sites required. No sites operated.

There are no minimum PM_{10} monitoring requirements for areas outside of MSAs.

Fine Particulate Matter: $PM_{2.5}$ (40 CFR Part 58 Appendix D Section 4.7 & 4.7.3) Two (2) sites required and 2 operated.

States are required to operate a background site and a transport site for $PM_{2.5}$. Nebraska's background site is in Scottsbluff, and the transport site is in Grand Island.

Coarse Particulate Matter: $PM_{10-2.5}$ (40 CFR Part 58 App D Sec 4.8) No sites required or operated.

Photochemical Assessment Monitoring Stations (PAMS) (40 CFR Part 58 Appendix D Section 5) No sites required or deployed.

Prior to 2015, PAMS were only required in areas classified as serious, severe, or extreme non-attainment for O_3. No such areas exist in Nebraska at this time. On October 1, 2015 EPA revised the PAMS requirements in 40 CFR part 58 Appendix D. As part of the revision, EPA required state and local air monitoring agencies to make PAMS measurements (including hourly averaged mixing height) at NCore sites in CBSAs with a population of 1,000,000 or more. The 2018 estimated population of the Omaha-Council Bluffs MSA, where Nebraska's only NCore site is located, was 942,217 which is below the threshold requiring PAMS monitoring.

IV: 40 CFR Part 58 Appendix E Review

This appendix sets forth requirements for probe and monitoring path placement, including: horizontal and vertical placement, spacing from minor sources, spacing from obstructions, spacing from trees, spacing from roadways, cumulative interferences on a monitoring path, maximum monitoring path length, and probe material and sample residence time. Compliance with these criteria is verified when the site is set up and periodically thereafter. Compliance is evaluated using review sheets developed for that purpose.

Appendix C: Compliance Verification with 40 CFR Part 58

Tables C-2a thru C-2c. Minimum Monitoring Reviews for Each Nebraska MSA*

Table C-2a. 40 CFR Part 58 Appendix D Review: Omaha-Council Bluffs MSA (MSA Population ~ 944,900)

Pollutant	App. D Citation	Review Criteria & *Comments*	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	The Omaha MSA population is between 350K to 4M and O_3 levels are ≥ 85% of NAAQS (*See Design Values in Appendix B).*	2	3 Includes NCore	Y
CO	Sec. 4.2	The population threshold for requiring a near-road CO monitoring site in a CBSA is 1 million. The population of the Omaha MSA is below this threshold.	0	2 Includes NCore	Y
NO_2	Sec. 4.3.2	The Omaha MSA has a population between 500K and 1M and is thus not currently required to have a near-road NOx monitoring site.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA ≥ 1M (Omaha MSA population < 1 M)	0	1 @ NCore	Y
	Sec. 4.3.4	Regional Administrator required monitoring: None at this time.	0	0	Y
SO_2	Sec. 4.4	The need for SO_2 sites is based on the *Population Weighted Emissions Index* (PWEI). Omaha's PWEI = 25,028, which falls within the 5,000 to 100,000 range requiring 1 site (see Table C-3 below for PWEI calculation data). The current network of two highest concentration sites and one NCore site exceeds the minimum requirements.	1	3 Includes NCore	Y
		Regional Administrator required monitoring: None at this time.	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting ≥ 0.5 tpy of lead in the Nebraska portion of the Omaha MSA.	0	0	Y
	Sec. 4.5 (b)	Revised regulations effective 4/27/16 eliminated the requirement for one community-based lead monitor at each NCore site. DCHD discontinued lead monitoring at the Omaha NCore site at the end of 2017 in accordance with this regulation change and the 2017 Network Plan.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: None at this time.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Omaha MSA has a population between 500K – 1M and a medium PM_{10} concentration range with max values > 80% of NAAQS at 46th & Farnam St Site in 2014 and 2015 and at the Weeping Water Farm site on four dates from 2014 to 2016. See Appendix B for PM_{10} data.	2-4	4 Includes NCore & 1 site @ Weeping Water	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Omaha MSA has a population between 500K – 1M and $PM_{2.5}$ levels < 85% of NAAQS range (*See Design Values in Appendix B).*	1	4 Includes NCore	Y
	Sec 4.7.2	Continuous monitor required.	1	1 @ NCore	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring required (included SASS and URG samplers as one)	1	1 @ NCore	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3 and at NCore sites in CBSAs with populations over 1,000,000. Omaha MSA population < 1 million.	0	0	NA
NCore	Sec. 3	Omaha has been designated to operate an NCore site with NO/NOy monitoring.	1	1	Y

* Unless noted otherwise, this analysis does not count monitors located in Iowa toward meeting the minimum monitoring requirements. It does consider pollutant levels measured at Iowa sites when determining minimum monitoring needs for ozone and $PM_{2.5}$.

Table C-2b. 40 CFR Part 58 Appendix D Review: Lincoln MSA (Population ~ 334,600)					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	The Lincoln MSA population is between 50K to 350K and O_3 levels < 85% of NAAQS (*See Design Values in Appendix B).*	0	1	Y
CO	Sec. 4.2	No minimum requirement	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA $\geq$ 1M (Lincoln MSA population < 1 M).	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring: none.	0	0	Y
SO_2	Sec. 4.4	The number of SO_2 sites required is based on the *Population Weighted Emissions Index* (PWEI). Lincoln's PWEI = 1,167, which falls below 5,000 (see Table C-3 below for PWEI calculation data). Thus no sites are required. However, LLCHD began operating a source-oriented SO_2 monitor near Hallam, NE in December 2016.	0	1	Y
		Regional Administrator required monitoring: none.	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting $\geq$ 0.5 tpy of lead.	0	0	Y
	Sec. 4.5 (b)	Community-based monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Lincoln MSA population is between 250K and 500K. Monitoring is only required if current monitoring indicates $PM_{10} \geq$ 85% of NAAQS. *The highest 24-hr value found during monitoring in Lincoln from 1988-98 was 102 $\mu g/m^3$ or 68% of the NAAQS, and PM_{10} concentrations have been declining in Nebraska since that time.*	0-1	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Lincoln MSA population is between 50K – 500K and $PM_{2.5}$ levels < 85% of NAAQS (*See Design Values in Appendix B).*	0	1	Y
	Sec 4.7.2	Continuous monitor not required.	0	1	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring not required.	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3.	0	0	Y
NCore	Sec. 3	Lincoln has not been designated to operate an NCore site.	0	0	Y

* Unless noted otherwise, this analysis does not count monitors located in Iowa toward meeting the minimum monitoring requirements. It does consider pollutant levels measured at Iowa sites when determining minimum monitoring needs for ozone and $PM_{2.5}$.

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-2c. 40 CFR Part 58 Appendix D Review: Sioux City MSA (Population ~ 169,000) *					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	The Sioux City MSA population is between 50K and 350K. Appendix D Sec. 4.1, Table D-2 says that for MSAs of this size 1 ozone site is required if the DV ≥ 85% of the NAAQS. There is one ozone monitor in the MSA located in a rural area of Union County, SD. The 3-year Design Value from this Union County site is 64 ppb or 91% of the NAAQS. *Nebraska has no current plans to install a second ozone monitor in the Sioux City MSA.*	1	0	Y See comment
CO	Sec. 4.2	No minimum requirement.	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA ≥ 1M (Sioux City MSA population < 1 M)	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring; none.	0	0	Y
SO_2	Sec. 4.4	The number of SO_2 sites required is based on the *Population Weighted Emissions Index* (PWEI). Sioux City MSA's PWEI = 2,290, which falls within the 5,000 to 100,000 range requiring 1 site (see Table C-3 below for PWEI calculation data). *One site exists in the MSA in Union County, SD.*	1	0	Y See comment
		Regional Administrator required monitoring: none	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting ≥ 0.5 tpy of lead in the Nebraska portion of the Sioux City MSA.	0	0	Y
	Sec. 4.5 (b)	Community-based lead monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none.	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	The Sioux City MSA population is between 100K – 250K and PM_{10} levels are < 80% of NAAQS (*See Design Values in Appendix B).*	0	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	The Sioux City MSA population is between 50K and 500K and $PM_{2.5}$ levels are < 85% of NAAQS, thus no monitor is required. (*See Design Values in Appendix B).*	0	0	Y
	Sec 4.7.2	Continuous monitor not required	0	0	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring not required	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3	0	0	Y
NCore	Sec. 3	The Nebraska portion of the Sioux City MSA has not been designated to operate an NCore site.	0	0	Y

* Unless noted otherwise, this analysis does not count monitors located in Iowa and South Dakota toward meeting the minimum monitoring requirements. It does use pollutant levels measured at IA and SD monitoring sites, when determining minimum monitoring needs for ozone and PM.

Appendix C: Compliance Verification with 40 CFR Part 58

Table C-2d. 40 CFR Part 58 Appendix D Review: Grand Island MSA (Population ~ 85,000)					
Pollutant	App. D Citation	**Review Criteria & *Comments***	Sites Required	Sites Operated	Criteria Met?
Ozone	Sec. 4.1 Table D-2	Grand Island MSA population is between 50K -350K. Monitoring is only required if current monitoring finds O_3 > 85% of NAAQS as set forth in Part 58 Appendix D Table D-2.	0	0	Y
CO	Sec. 4.2	No minimum requirement.	0	0	Y
NO_2	Sec. 4.3.2	Near-road monitoring: No requirement for CBSA < 500K.	0	0	Y
	Sec.4.3.3	Area-Wide monitoring only required if CBSA ≥ 1M (Grand Island MSA population < 1 M)	0	0	Y
	Sec. 4.3.4	Regional Administrator required monitoring: none	0	0	Y
SO_2	Sec. 4.4	*Population Weighted Emissions Index* (PWEI) = 141, which falls below 5,000 (see Table C-3 below for PWEI calculation data). No minimum number of sites required.	0	0	Y
		Regional Administrator required monitoring: none	0	0	Y
Lead	Sec. 4.5 (a)	There are no sources emitting ≥ 0.5 tpy of lead	0	0	Y
	Sec. 4.5 (b)	Community-based lead monitoring not required.	0	0	Y
	Sec. 4.5 (c)	Regional Administrator required monitoring: none	0	0	Y
PM_{10}	Sec. 4.6 Table D-4	PM_{10} monitoring is not required if MSA population < 100,000	0	0	Y
$PM_{2.5}$	Sec 4.7 Table D-5	Grand Island CBSA population is between 50K – 500K and $PM_{2.5}$ levels are < 85% of NAAQS (*See Design Values in Appendix B)*	0	1(1)	Y
	Sec 4.7.2	Continuous monitoring is not required	0	0	Y
	Sec. 4.7.4	$PM_{2.5}$ Speciation Trends Network monitoring is not required	0	0	Y
PAMS	Sec. 5	Only required for areas classified as serious, severe, or extreme non-attainment for O_3	0	0	Y
NCore	Sec. 3	The Grand Island MSA has not been designated to operate a NCore site	0	0	Y

Footnote:
(1) The $PM_{2.5}$ site operated in Grand Island is Nebraska's transport site.

Table C-3. Population Weighted Emissions Index (PWEI) Data for Nebraska Core Based Statistical Areas (CBSAs) [(a) (b) (c)] Page 1 of 2

CBSA	County	Population 7/1/17 [(c)]	SO_2 Emissions (tons/year)		SO_2 Emissions (% Change)	PWEI [(a) (b)]	
			2011 EI	2014 EI		2011 EI	2014 EI
Omaha MSA	Douglas	561,620	14,311	11,514	-20%	28,634	**24,028**
	Sarpy	181,439	29	60	107%		
	Cass	25,889	1,094	1,279	17%		
	Saunders	21,057	20	37	85%		
	Washington	20,721	60	32	-47%		
	Pottawattamie, IA	93,386	15,101	13,808	-9%		
	Mills, IA	15,068	22	22	0%		
	Harrison, IA	14,136	43	64	49%		
	Totals	**933,316**	**30,680**	**26,816**	**-13%**		
Lincoln MSA	Lancaster	314,358	4,254	3,446	-19%	1,425	**1,156**
	Seward	17,161	43	41	-5%		
	Totals	**331,519**	**4,297**	**3,487**	**-19%**		
Sioux City MSA	Woodbury, IA	102,429	29,693	13,473	-55%	5,027	**2,285**
	Plymouth, IA	25,220	18	27	50%		
	Dakota	20,186	14	25	79%		
	Dixon	5,754	13	12	-8%		
	Union, SD	15,029	74	12	-84%		
	Totals	**168,618**	**29,812**	**13,549**	**-55%**		
Grand Island MSA	Hall	61,519	2,378	1,552	-35%	211	**141**
	Hamilton	9,207	29	24	-17%		
	Howard	6,437	40	29	-28%		
	Merrick	7,782	33	50	52%		
	Totals	**85,045**	**2,480**	**1,655**	**-33%**		

Observation: The EPA's emission inventory data indicates that SO_2 emissions from all 4 of Nebraska's MSAs decreased 13% to 55% from 2011 to 2014.

Footnotes at bottom of page 2 of this table.

Table C-3. Population Weighted Emissions Index (PWEI) Data for Nebraska Core Based Statistical Areas (CBSAs) [(a) (b) (c)] Page 2 of 2

CBSA	County	Population 7/1/17 [(c)]	SO_2 Emissions (tons/year)		SO_2 Emissions (% Change)	PWEI [(a) (b)]	
			2011 EI	2014 EI		2011 EI	2014 EI
Kearney MiSA	Buffalo	49,732	89	75	-16%	6	**5**
	Kearney	6,530	15	5	-67%		
	Totals	**56,262**	**104**	**80**	**-23%**		
Norfolk MiSA	Madison	35,144	24	16	-33%	13	**8**
	Pierce	7,138	30	29	-3%		
	Stanton	5,988	206	126	-39%		
	Totals	**48,270**	**260**	**171**	**-34%**		
Hastings MiSA	Adams	**31,678**	**3,324**	**3,186**	-4%	105	**101**
Scottsbluff MiSA	Banner	742	1	1	0%	8	**9**
	Scotts Bluff	36,363	203	201	-1%		
	Sioux	1,203	15	22	47%		
	Totals	**38,308**	**219**	**224**	**2%**		
North Platte MiSA	Lincoln	35,280	29,246	24,594	-16%	1,070	**899**
	Logan	768	37	1	-97%		
	McPherson	499	2	2	50%		
	Totals	**36,547**	**29,285**	**24,598**	**-16%**		
Fremont MiSA	Dodge	**36,707**	**1,426**	**2,262**	**59%**	52	**83**
Columbus MiSA	Platte	**33,175**	**330**	**405**	**23%**	11	**13**
Lexington MiSA	Dawson	23,709	64	68	6%	2	**2**
	Gosper	2,028	14	6	-57%		
	Totals	**25,737**	**78**	**74**	**-5%**		
Beatrice MiSA	Gage	**21,601**	**87**	**34**	**-61%**	2	**1**

Footnotes:
(a) Population Weighted Emission Index (PWEI) = (CBSA Population) x (SO_2 Emissions (tpy))/1,000,000.
(b) SO_2 Emission data were obtained from the EPA Emission Inventory database for 2011 and 2014. The 2014 EI data is the most recent data available from EPA at the time this table was created (March 2018).
(c) U.S. Census population estimate data for 7/1/2017 were used in this table and the PWEI calculations.
The PWEI calculated with 2014 Emission Inventory data is currently applicable. The PWEI was also calculated with 2011 EI data to document any change that might have occurred.

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Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

Project Description

State air quality agencies are required to conduct source-oriented lead monitoring from each source that emits lead at a rate equal to or more than the emission threshold of 0.50 tpy, unless a waiver is granted as allowed by 40 CFR part 58 Appendix D, paragraph 4.5(a)(ii)) for sources that will not contribute to lead concentrations in ambient air in excess of 50% of the NAAQS.
A lead monitoring waiver is currently in place with U.S. EPA for Nucor Steel, in Norfolk, NE. The waiver was approved by U.S. EPA 16 April 2014, and must be renewed every five years.

This document is a summary of the source-oriented lead modeling for the renewal of this waiver. Modeling results for this facility demonstrated that it does not have the potential to contribute to a maximum lead concentration greater than 50 percent of the NAAQS.

Air Dispersion Model

The Pb modeling analysis was processed using the current regulatory air dispersion model, AERMOD version 18081. The three month rolling average was calculated using LEADPOST version 13262.

Lead (Pb) Emissions

Nucor's facility-wide allowable or PTE lead (Pb) emissions, documented in the July 17, 2017 Construction Permit #16-043, is 1.55 tpy. Nucor's facility-wide actual Pb emissions are displayed in the Table D-1 below, listing 10 years of Pb Emission Inventories in tons/year, as reported to the NDEQ.

Table D-1. Historical Lead Emissions as Reported to NDEQ Emissions Inventories (tpy)

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0.75	0.51	2.03	0.50	0.63	0.81	0.11	0.91	0.15	0.19

The 2019 NDEQ Pb monitor waiver model processed 2.21 tpy through 710 haul road sources, 39 fugitive sources, and 32 point sources, using EU PTEs and additional pseudo point sources as used in the 2012 Pb monitor waiver model.

Location and Identification of Baghouse

Location and dates of installation of Nucor's baghouses has caused some confusion, and this is due to the Emission Inventory Emission Point IDs. The original baghouse, installed in 1997, and the new baghouse, installed in 2014, were assigned the same emission point IDs in Emission Inventories, 8a.1. These are two different emission units, as shown in Figures D-1 and D-2 below. The baghouse labeled 8A1_1, installed in 1997, is a positive pressure canopy baghouse that controls the canopy, ladle metallurgy facility (LMF), and casters. The baghouse labeled 8A1_2 was installed in 2014, and is a negative pressure EAF baghouse that controls the electric arc furnace (EAF).

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Figure D-1: Google Earth image of Nucor Steel facility with locations of baghouses 8a1_1 and 8a1_2 labeled.

Figure D-2. Portion of Nucor Steel 2017 Air Emission Inventory showing duplicate Process Number identifiers for two baghouses.

2017 Emission Inventories

Table A.4 Air Pollution Control Equipment Information (Form 2.0)

Process Number	Date Installed	Description of Control Device	Pollutant(s) Removed	Control Efficiency
3	--	Fluxing Agent Silo Vent System	PM/PM10/PM2.5	99%
3a	2000	FS Carbon Bin Vent System	PM/PM10/PM2.6	99%
7a	1999	EAF Dust Silo Baghouse Vent (active)	PM/PM10/PM2.5	99%
7b	1997	EAF Dust Silo Baghouse Vent (passive)	PM/PM10/PM2.6	99%
8a.1	1997	Positive Pressure Canopy Baghouse	PM/PM10/PM2.7	99%
8a.1	2014	Negative Pressure EAF baghouse	PM/PM10/PM2.8	99%
10	1993	Ladle Degasser Hotwell Vent/Flare	CO	99%
12	2003	Low-Nox burners	Nox	49%
13	2001	Ultra Low Nox Burners	NOx	51%

Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

Source Groups
One source group, the All source group, was processed for this analysis.

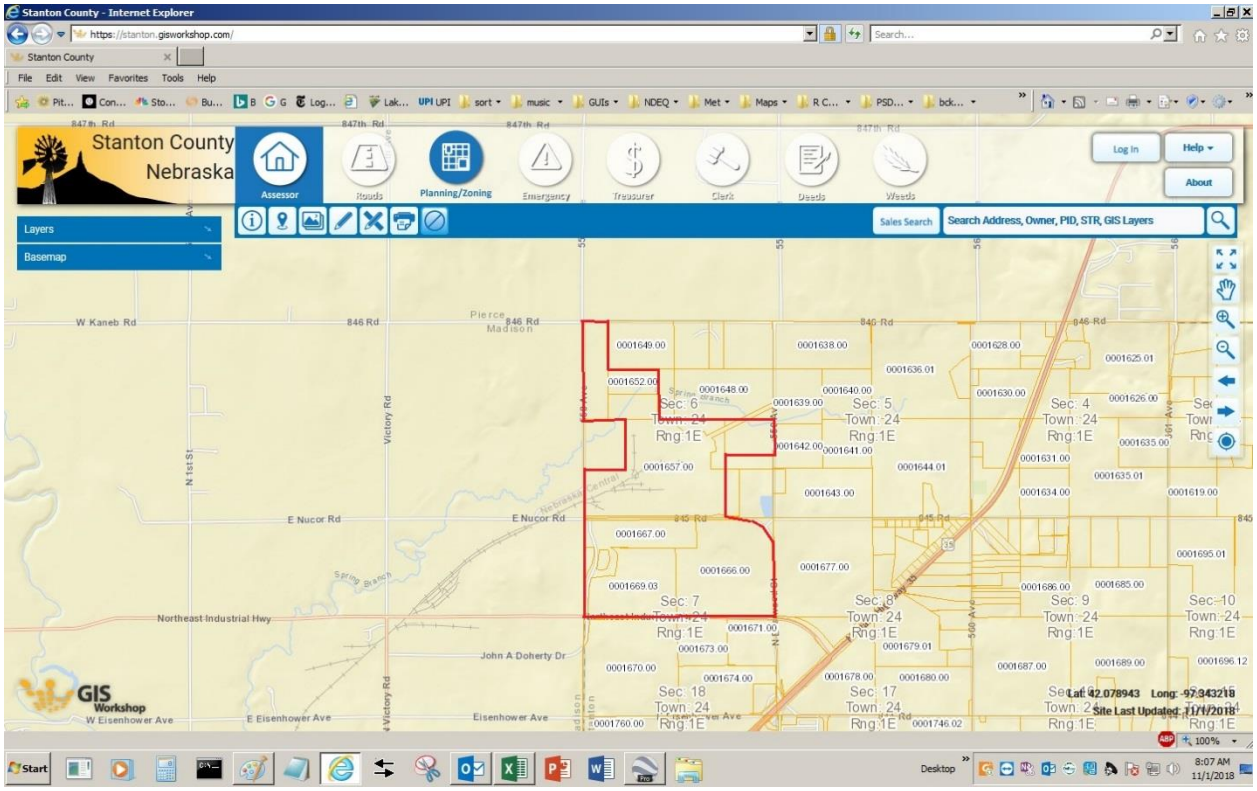
Regulatory Default
Five year concatenated 20008-12 met files, Pollutant: Other Output: Monthly H1H & ASCII POSTFILE

Buildings and Downwash
BPIPRIME
Table of Building Parameters

Terrain and Land Use
AERSURFACE version 13016
AERMAP version 11103

Receptor Grid
Nucor Steel's property is located in two counties, Stanton County and Madison County. The boundary receptors were verified using Stanton and Madison county tax records, and it was determined that receptors had been incorrectly placed in the 2013 Pb waiver model. This error was corrected in the 2019 Pb monitor waiver request; see images below.

Figure D-3. Boundary of Nucor Steel property (east half) in Stanton County, Nebraska



Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

Figure D-4. Boundary of Nucor Steel property (west half) in Madison County, Nebraska

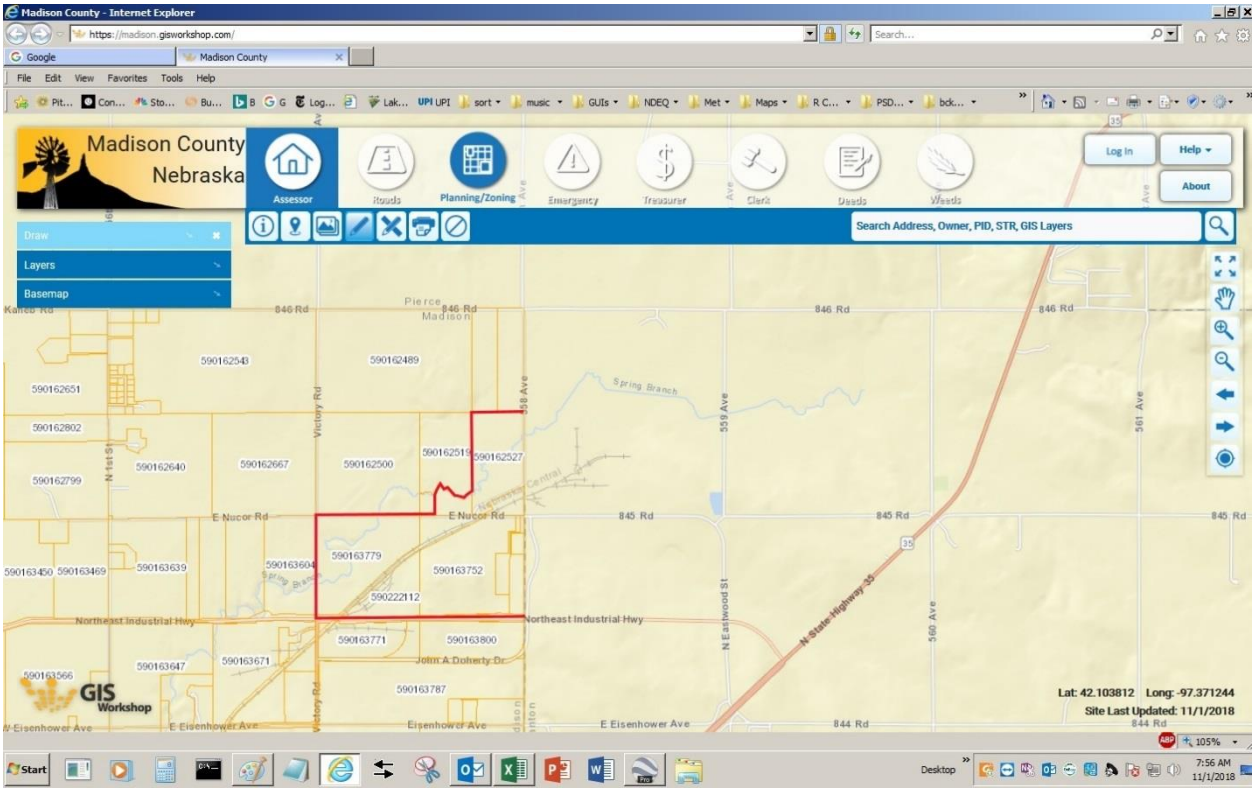
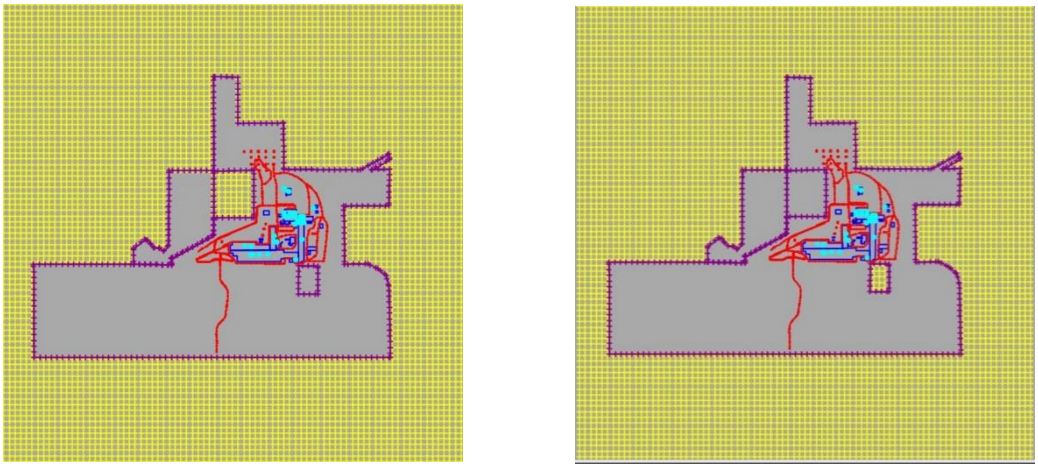


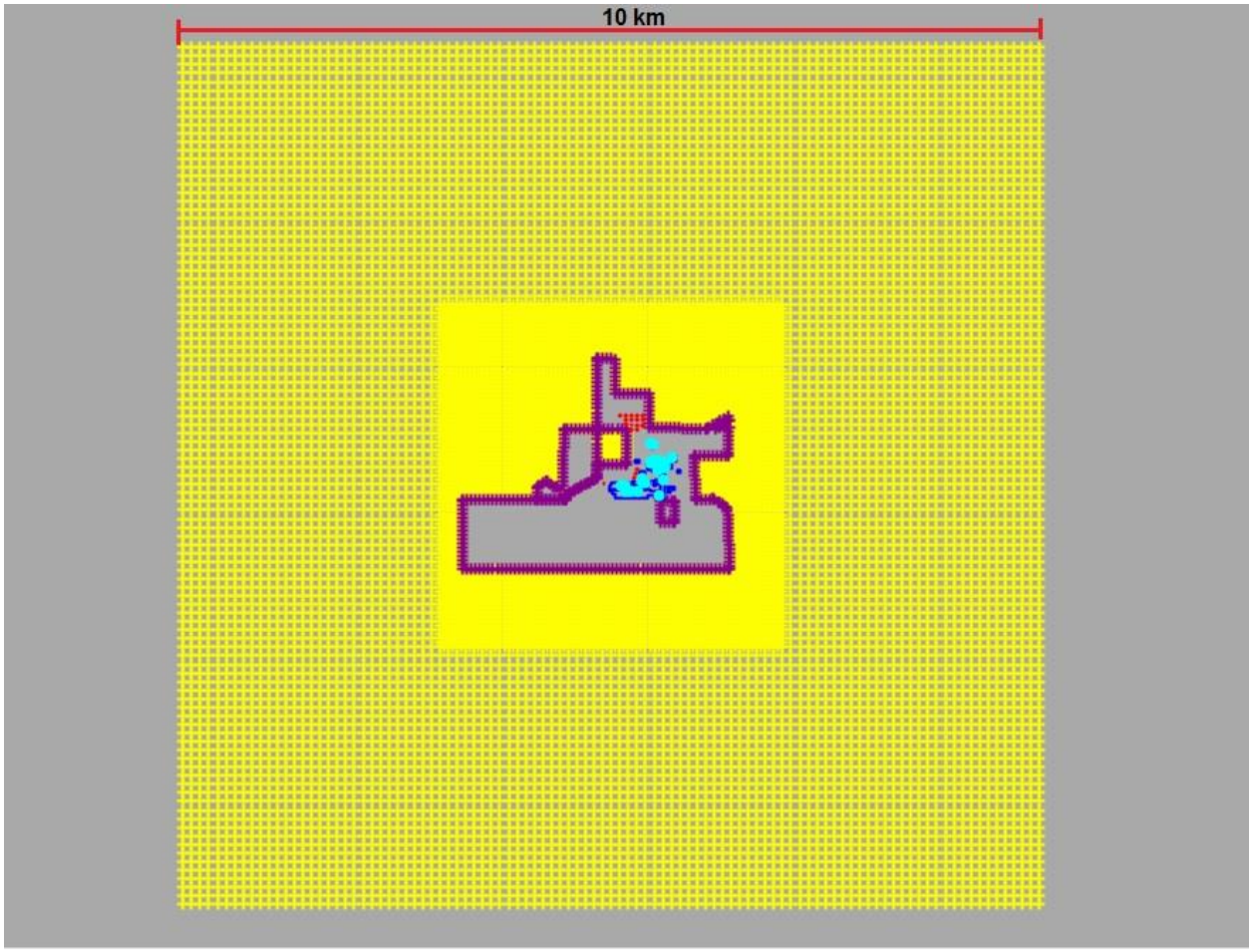
Figure D-5. Model Receptor Grids near the Nucor Steel plant. 2019 Pb waiver model with correctly-placed receptors (left) and 2013 Pb waiver model with incorrectly-placed receptors (right).



Boundary receptors are spaced every 50 meters. Receptors out to 400 meters from boundary line are also spaced every 50 meters. The rest of the receptors are spaced every 100 meters, out to 3 km from all sides of the Nucor facility.

Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

Figure D-6. Complete 2019 Model Receptor Grid.



Nearbys

The NDEQ used the most current, complete, and validated emissions inventory information available when identifying non-airport lead sources with emissions at or above 0.5 ton per year for potential monitoring under the December 27, 2010, EPA final rule on lead (75 FR 81126). Using the 2014 NEI, it was revealed that the nearest major source emitters of lead are greater than 100 km from the Nucor Steel facility. The five closest nearby sources are shown in the Table D-2 below with their respective Pb actual emission rates.

Table D- 2. Five Highest-Emitting Major Sources of Pb that are the Closest Pb Sources to Nucor Steel

Facility Name	FID#	Pb (tpy)	Lon	Lat	Distance from Nucor (km)	Reference	Comments
Magnus	9176	0.67	-96.4816	41.4231	103.4	2013 & 2016 NDEQ EIs	2-yr avg Pb emissions: 0.77 tpy in 2013; 0.56 tpy in 2016
Lon D Wright Power Plant	48518	0.06	-96.4622	41.4277	104.2	2015, 2016 & 2017 NDEQ EIs	3-yr avg Pb emissions: 0.06 tpy in 2015, 2016, and 2017
Valmont	57476	0.08	-96.366	41.3276	117.7	2016 & 2017 NDEQ EIs	2-yr avg Pb emissions: 0.08 tpy in 2016 & 2017

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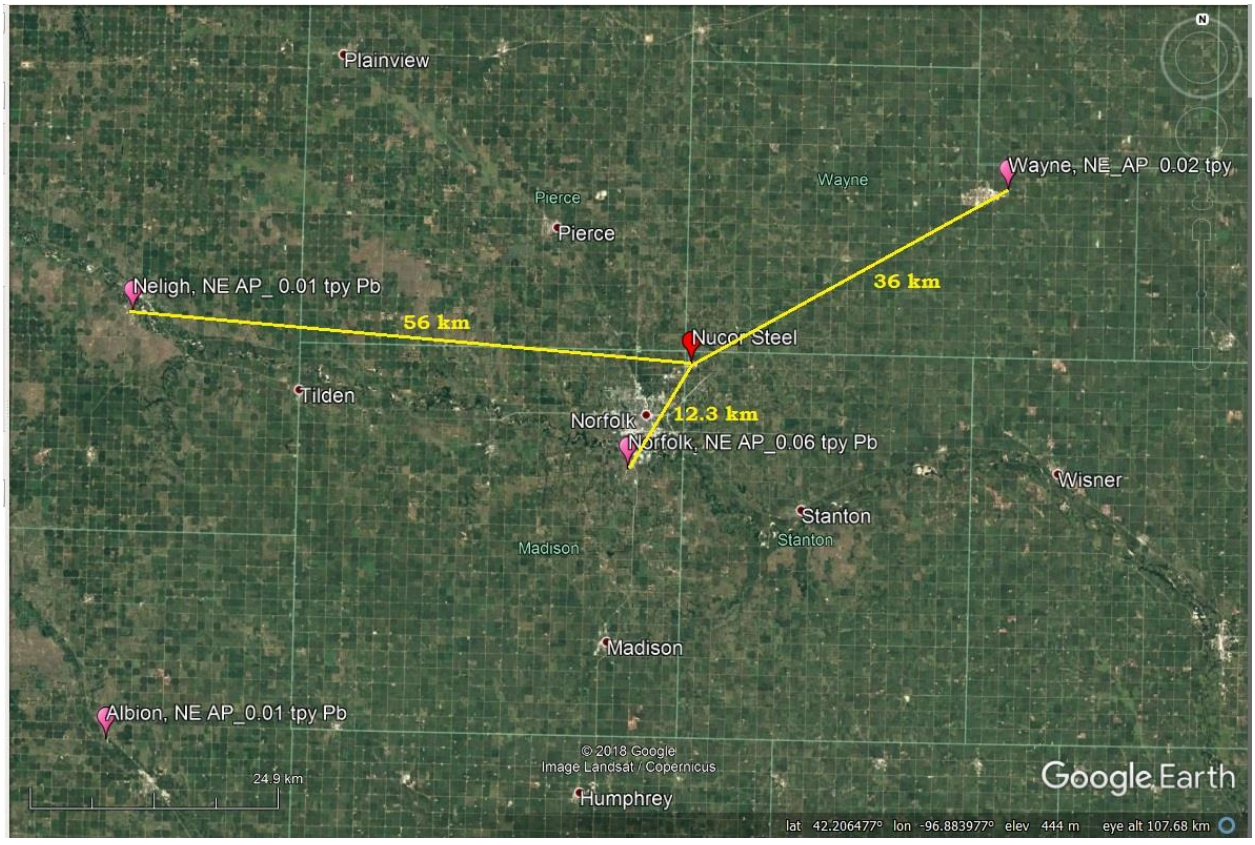
Table D- 2. Five Highest-Emitting Major Sources of Pb that are the Closest Pb Sources to Nucor Steel

Facility Name	FID#	Pb (tpy)	Lon	Lat	Distance from Nucor (km)	Reference	Comments
OPPD - North Omaha Power Station	59763	0.11	-95.945832	41.329911	144.4	2014 EPA NEI	1-yr Pb emissions: 0.11 in 2014
C W Burdick Generating Station	54712	0.00	-98.3269	40.9228	151.4	2015, 2016, & 2017NDEQ EIs	3-yr avg Pb emissions: 0.00 tpy in 2015, 2016, and 2017

Three minor nearby facilities, all Airports, are shown in Figure D-7 below, illustrating the distance to Nucor and their 2017 actual emissions. The distance and emission rates of these nearbys are insignificant and are not included in this modeling demonstration.

Figure D-7. Locations of Nearby Airports and Distances from Nucor Steel facility.



Meteorological Data

The Norfolk, NE (KOFK) is the closest surface air meteorological tower to Nucor Steel, located about 13 km away. The most recent, consecutive, and complete meteorological data available at the Norfolk, NE AP are the years 2008 through 2012 met years. In 2013, seven months of AERMINUTE wind data was lost, making the 2013 met year incomplete and unusable.

Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

The 2008 - 2012 Norfolk surface air – Omaha upper air met files were processed using AERMET v. 18081, AERSURFACE v. 13016, and AERMINUTE v. 15272.

Results

Maximum monthly AERMOD results were processed with LEADPOST v 13262. The 3-month rolling average was predicted to be 0.04 µg/m^3, or 27% of the Pb NAAQS.

Maximum Pb	NAAQS	Averaging Time	X UTM	Y UMT
0.04	0.15	3-month rolling	635312.69	4660092.50

Modeling Files on the DVD NDEQ 2019 Monitor Wavier Request

2019 Pb Model

AERMOD Input File Nucor_Final Pb_2019.ami
AERMOD Output File Nucor_Final Pb_2019.aml & Nucor_Final Pb_2019.amz

LEADPOST Version 13262

LEADPOST Results.zip
Results from lead out file.txt

2011 thru 2013 Lead Models

CD P001 Apr 2011
CD P002 Mar 2012
CD P004 Dec 2012

Documents

2009_May_02_DRAFT_Technical Note – Pb Ambient Air Monitoring Network Design Issues_EPA
2009_May_02_DRAFT_Technical Note –Dispersion Modeling for Pb Sources_EPA
2011_Jan_27_NDEQ Letter to Nucor_Source-Oriented Pb Monitor_Modeling Request_NDEQ
2011_Jun_06_Nucor Pb Modeling Report_JBR
2011_Nov_07_Status of Lead Modeling_JBR
2011_Dec_30_Nucor Pb Modeling Report_JBR
2012_ March 14_Nucor Pb Model Report_revision_JBR
2012_Mar_23_ of Pb Emissions Testing Report_JBR
2012_May_01_EPA Comments on Nucor Modeling_2012_March_14_JBR Report revision_EPA
2013_Aug_01_Nucor Pb Modeling Report_JBR
2014_Apr_16_EPA Lead Monitor Waiver_EPA

Terrain Data

UTM WGS 84 Zone 14 NED files

Pierce_NED.zip
Wayne _NED.zip
Stanton _NED.zip
Madison _NED.zip

Fence Line

images
GIS Works Tax records property search.xlsx

Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

Regulatory References

November 12, 2008 [73 FR 66963 - National Ambient Air Quality Standards for Lead]
EPA finalized the current lead NAAQS to be 0.15 µg/m^3 on based on a three month rolling average.

December 27, 2010 [75 FR 81126 Revisions to Lead Ambient Air Monitoring Requirements]
EPA lowered the emission threshold of annual emissions of lead from one ton or more per year to 0.5 ton per year or more PER YEAR in actual emissions that State agencies must use to determine if an air quality monitor should be placed near a facility that emits lead.

40 CFR part 58 App.D, § 4.5(a)(ii)

4.5 Lead (Pb) Design Criteria. (a) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-oriented data) taking into account logistics and the potential for population exposure.

(i) One monitor may be used to meet the requirement in paragraph 4.5(a) for all sources involved when the location of the maximum Pb concentration due to one Pb source is expected to also be impacted by Pb emissions from a nearby source (or multiple sources). This monitor must be sited, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum.

(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under §58.10(d).

(iii) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D-3A for a period of 12 consecutive months commencing no later than December 27, 2011. Monitors shall be sited to measure the maximum Pb concentration in ambient air, taking into account logistics and the potential for population exposure, and shall use an approved Pb-TSP Federal Reference Method or Federal Equivalent Method. Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3-month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted allowing it to stop operating as allowed by the provisions in paragraph 4.5(a)(ii) of this appendix. Data collected shall be submitted to the Air Quality System database according to the requirements of 40 CFR part 58.16.

Appendix D: Summary of NDEQ's 2019 Source-Oriented Lead Modeling for Renewal of Nucor Steel Lead Monitor Waiver

40 CFR part §58.10 Annual monitoring network plan and periodic network assessment.
(4) A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting 1.0 tpy or greater shall be submitted to the EPA Regional Administrator no later than July 1, 2009, as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting 1.0 tpy or greater to be operational by January 1, 2010. A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy shall be submitted to the EPA Regional Administrator no later than July 1, 2011. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy to be operational by December 27, 2011.