CHAPTER 4:
Air Quality Programs

The objective of the Air Quality Programs is to maintain and protect the quality of the outdoor air in Nebraska. Thousands of tons of pollutants are emitted into the air in the state each year from industrial and other human activities. These air pollutants can affect human health, cause property damage, harm the environment, and reduce visibility. The Air Programs work to maintain Nebraska's air quality by implementing state and federal air quality regulations, through permitting and compliance activities for stationary sources, and by monitoring outdoor ambient air for regulated pollutants. Nebraska's air quality rules are set forth in Nebraska Administrative Code (NAC) *Title 129 – Nebraska Air Quality Regulations* (Title 129).

Nebraska enjoys good ambient air quality, with all parts of the state in compliance with federal and state ambient air quality standards.

The regulated air pollutants of most concern are particulate matter, ozone, nitrogen oxides, sulfur dioxide, carbon monoxide, and lead. These pollutants are subject to National Ambient Air Quality Standards (NAAQS). All areas of the state are currently in attainment, meaning that the state has air cleaner than the federal limits for these pollutants. Maintaining compliance with these federal standards is important to protect the public health. NAAQS nonattainment could result in additional requirements and significant economic costs to regulated facilities and the state. The Department also regulates the emission of substances defined by the U.S. Environmental Protection Agency (EPA) as hazardous air pollutants (HAPs), which are toxic substances known to cause cancer and other serious health impacts. Title 129 does not include any requirements specifically for the control of odors.

The Air Quality Programs consist of Air Permitting, which issues construction permits, operating permits, and performs air dispersion modeling; and Air Compliance, which compiles emission inventories, and conducts inspections and other compliance and enforcement activities. The Remediation and Monitoring Division maintains an ambient air quality network and evaluates stack tests. In addition, Air Planning staff work to monitor federal regulations, update state regulations and Nebraska's state implementation plans to remain in compliance with air quality standards, and inform the regulated community and the public about changes in air quality regulations.

Through an agreement with the Department and direct delegation from the EPA, three local agencies — Lincoln-Lancaster County Health Department, Omaha Air Quality Control, and Douglas County Health Department — have accepted responsibility for various facets of the air

quality program within the jurisdictions of those agencies. These responsibilities include air quality monitoring, permitting, and enforcement.

Air Permitting

An air quality permit sets enforceable limits on the amounts of pollutants that a facility may emit, ensuring that facilities are constructed and operated in a manner that protects the quality of the surrounding ambient air. The Department issues two main types of air quality permits: construction permits and operating permits. A construction permit may be required for a facility before the construction or modification of an emission unit. An operating permit may be required for an existing facility source of certain air pollutants. Currently, there are approximately 1,207 facilities that have received a construction permit and/or an operating permit.

Title 129 provides for three types of construction and operating permits: individual, permit-by-rule, and general. Some sources are not eligible for coverage under permit-by-rule or general permits. Some sources will require a construction permit, but may not require an operating permit.

Individual permits are available for all regulated sources. These permits include all requirements applicable and specific to that source and location. Because it is “tailor made” for the source, significant time and labor is required for each permit issued. The individual permit process includes a required public notice with a 30-day comment period.

A permit-by-rule and a general permit are similar in that the rule or general permit has the same requirements for, and covers, all sources in a particular industrial category, provided that the source meets the applicability criteria and applies for and obtains coverage. The requirements for a permit-by-rule are established in Title 129. Requirements for a general permit are established in that general permit. Each general permit is issued only once (including the public notice period). Eligible applicants then apply for and obtain coverage without the need to develop an individual permit for that facility or to go through a public comment period each time coverage is approved for an eligible source under that permit-by-rule or general permit.

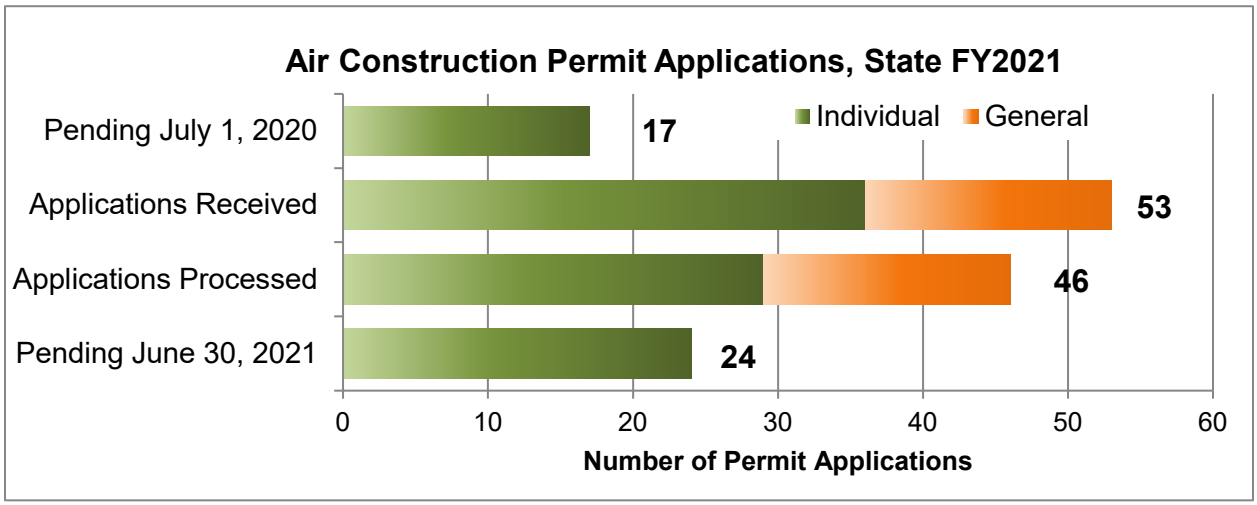
General construction permit coverage is currently available for eligible sources in nine categories (including time-sensitive construction activities), and general operating permit coverage is available for one category (small incinerators). Approval of general and permit-by-rule coverage takes much less time for the agency and for the facility than an individual permit. The permit-by-rule approval process usually takes less than 30 days. An online-only application process is used for general permit coverage, and approval may take only a few days or less.

Construction Permit Program

The Department has maintained a construction permit program for air contaminant sources since the 1970s. Facilities are required to obtain a construction permit before they construct, reconstruct, or modify any air contaminant source or emission unit where there is a net increase in the potential to emit above thresholds specified in Title 129 for particular pollutants. Only

sources with potential emissions at or above these thresholds are required to obtain a construction permit. A construction permit is valid for the life of the covered emission units.

The following graph summarizes construction permit applications received, processed, and pending during the 2021 state fiscal year. (Note: the *Processed* category includes permits issued, withdrawn, denied, and determinations of no permit required.)

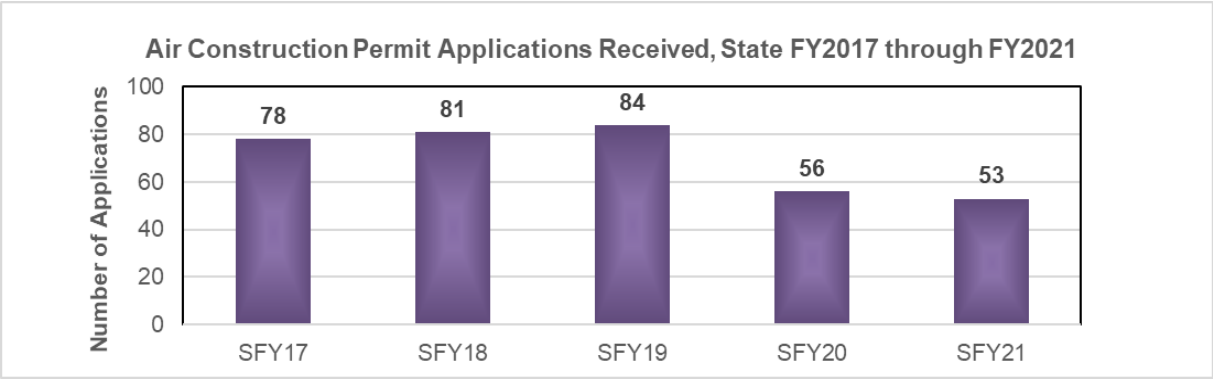


Nebraska's program also implements the federal construction permit program, called Prevention of Significant Deterioration (PSD). The PSD program applies to construction of new major sources or major modifications to existing sources that emit significant levels of certain types of pollutants. The purpose of the PSD program is to protect air quality in areas where the air is cleaner than the ambient air quality standards while still allowing industrial and economic growth.

For facility sources regulated under the construction permit program that emit levels of certain types of air pollutants sufficient to trigger PSD requirements, Air Program staff conduct additional, more rigorous reviews of the construction permit application to ensure that best available control technology will be used in order to minimize impacts on the environment. The Department must also assure that the source will not cause or contribute significantly to any deterioration of air quality or violations or exceedances of the ambient air quality standards.

The PSD program helps to protect visibility in nearby national parks and wilderness areas. The Department notifies federal land managers and nearby States and Tribes of pending PSD decisions and those authorities can express relevant concerns for potential impacts.

The economy and business activity in the state impact the number of air quality construction permit applications received each year. The following graph shows the number of construction permits received annually from state FY2017 through FY2021.



Air Dispersion Modeling

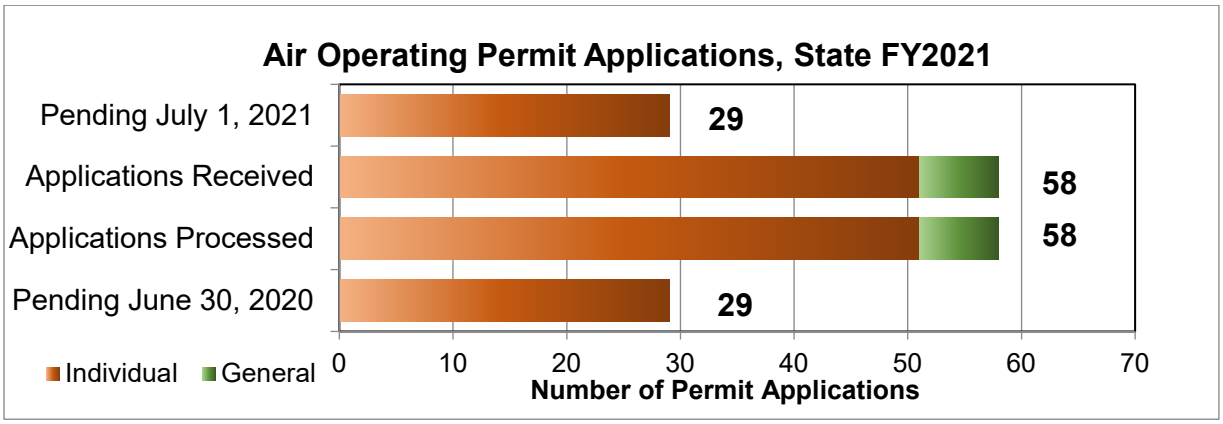
Air dispersion computer models predict how air pollutants emitted by a facility spread and disperse. These regulatory models use expected emissions, meteorological and geographical data, and other factors to estimate ground level concentrations of air pollutants at a large array of locations outside of the facility fence line. In a relatively short amount of time, a model can predict the ground-level impact of facility emissions in a standardized and cost-effective manner.

Modeling is required in conjunction with an air quality construction permit application when the expected increase in emissions of any regulated pollutant by a facility is greater than the emission rate specified in state or federal regulations. An air dispersion model is the primary tool used to determine if the predicted impacts from a new facility or modification will be in attainment with current air quality standards. Models are also used as a design tool to analyze the effects of different pollution control strategies. The Air Program's air dispersion modeler reviews all aspects of the models that facilities provide as part of their construction permit applications. These reviews include facility emissions and meteorological data, background concentrations, the modeling protocol, and the final modeling results.

Operating Permit Program

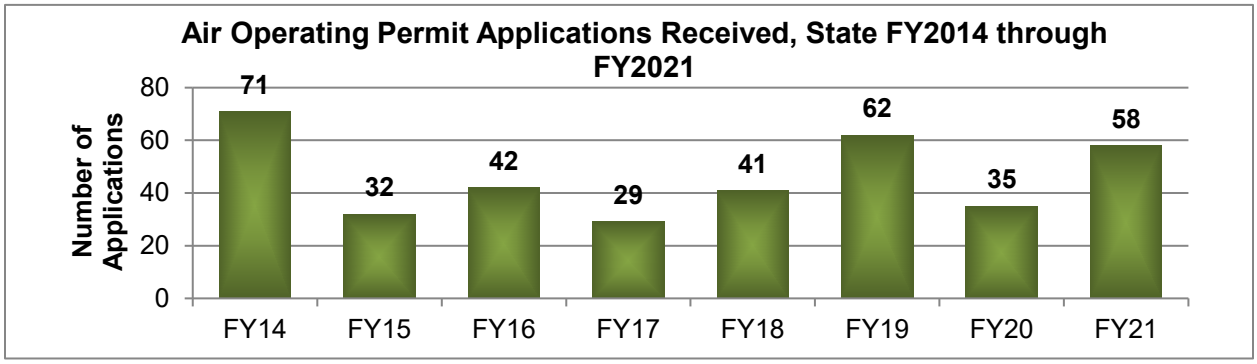
As required by Title V of the Federal Clean Air Act Amendments of 1990, Nebraska issues operating permits for Class I (major) sources of certain air pollutants. The Department also regulates minor sources using Class II operating permits as required under Nebraska law. Application for an operating permit is required by Title 129 within 12 months of startup of a regulated air contaminant source. Title 129 provides for operating permit terms up to five years, after which the permit must be renewed. An operating permit contains all applicable requirements for emission points at a facility. For a large, complicated, growing facility, an operating permit incorporates requirements from all construction permits issued for the facility, providing the source with one permit document to help compliance with all associated air permitting requirements.

The following chart provides statistics on the number of operating permit applications received, processed, and pending during the 2021 state fiscal year. These statistics include general permit coverage approvals. The current general operating permit for small incinerators was issued in FY2018, replacing the previous five-year general operating permit that expired that year. Most of the general operating permit coverages issued in FY2021 were for new applicants requesting coverage for their small animal incinerator. (The current general operating permit for small incinerators is available through an efficient online process, whereas the previous general permit required a paper application).



The Nebraska operating permit program also offers an innovative alternative for major sources that have taken measures to keep their emissions very low, called the Low Emitter Rule. To be eligible, a Title V or Class I source must document five years of actual emissions at or below the Class II or minor source threshold levels, meet other requirements established in the regulations, and not otherwise be required to obtain an operating permit. Since its inception in 1997, the Low Emitter Rule has allowed 129 sources to opt out of their major source operating permits, with no identifiable degradation of air quality in Nebraska.

The five-year renewal cycle, past delays in issuing renewals, and other factors have resulted in wide variations over time in the numbers of operating permits up for renewal each year. The chart below summarizes air quality operating permit applications received from State FY2014 through FY2021 (applications for all application types, including permit revisions, general operating permits, permit-by-rule, etc.).



Permit Program Process Improvements

Individual construction and operating permits are complex, highly technical documents that must address all emission points for various pollutants at a facility in a manner that is enforceable as a practical matter. Processing a permit application includes complex analysis with multiple steps and personnel. In FY2020, the Operating Permits Team undertook a process improvement project on operating permit renewals and applications. The project resulted in a significant reduction in the time needed to prepare and process an operating permit renewal application. One applicant estimated an 80% reduction in their application preparation time. The Air Programs have documented similar savings in staff time to process the renewal.

Each construction and operating permit includes a fact sheet, which provides a technical description of the facility, applicable regulatory requirements, and a statement of basis for each permit condition. Air Program staff made significant fact sheet process improvements in FY2018 and will revisit permit fact sheets each year to pinpoint opportunities for streamlining. Additional improvements were made in FY2020 and 2021 that continue to make these fact sheets more uniform and easier to understand, making compliance easier for facility staff, which also assists the efforts of agency compliance inspectors.

With the process improvement event that started in 2016, fact sheet project initiated in 2018, and other ongoing efforts, the average time required to reach a decision on a construction permit application improved significantly from 188 days to approximately 85 days (including online-only general construction permit coverage) at the end of FY2021. The operating permit application backlog was also significantly improved down from approximately 120 applications a few years ago to 29 applications pending at the end of FY2021, even with a steady influx of applications. Although some impacts of improvements may not be realized in the immediate future, sources with permits being issued now should see processing times significantly improved when they apply for permit renewal.

The Air Quality Permitting Programs have consistently had a significant amount of staff turnover, leading to recurring discussions about permit decisions, regulations and other challenges. The Air Program staff established an electronic Air Quality Permitting Compendium that allows important information about existing permits — such as permit decisions, regulatory determinations, and internal procedures — to be archived, easily searched, and readily accessible to Air Program Staff. In addition, the Air Program revamped new employee onboarding procedures. These are two examples of the significant efforts to help improve staff training and permitting consistency. This tool allows Air Program staff to research past permitting actions and associated publications and documents to help facilitate more rapid permit and uniform permit decisions.

At the end of FY2020, the Air Construction Permitting Program started pursuing a project to develop an online air construction permitting process. The objectives of the project are to make permit applications easier and more accessible for regulated facilities, to streamline the permitting process, and to reduce application errors. An online system will ensure applications are complete and would be received electronically by the agency. This will reduce document handling time (mailing, processing, and scanning) and deliver applications to the program staff in a timelier manner.

During the last half of FY2021 the Air Program began working on and completed draft versions of six White Papers to help sources to understand different aspects of the air program and how it applies to them. Once the white papers are completed, they will be placed in the Air Program's Compendium Public Section for reference. The Titles of the White Papers are:

Blanket Emissions Limits – *When are they allowed*?
Continuous Emissions Monitoring Systems (CEMS) vs Performance Testing
Major, Minor, and Synthetic Minor Sources – *Foundation Station*
Wet Scrubber Operational Parameter Monitoring and Variability at Ethanol Plants
Air Quality Permit Limits and Enforceability – *Then and Now*
Potential to Emit (PTE) – *What it means for me?*

Air Compliance

Ambient Air Quality Monitoring Program

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment, which are called "criteria pollutants." The Act established two types of national air quality standards: primary standards, which are intended to protect public health, and secondary standards, intended to protect the environment. National standards have been established for the following six pollutants:

- Particulate Matter (PM)
  - With a diameter of 10 micrometers or less (PM_{10})
  - With a diameter of 2.5 micrometers or less ($PM_{2.5}$)
- Sulfur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Ozone (O_3)
- Lead (Pb)

Nebraska has an additional ambient air quality standard for Total Reduced Sulfur (TRS). The TRS standard was adopted by the Environmental Quality Council in 1997 and is a public health-based standard.

Nebraska Ambient Air Monitoring Network

The State of Nebraska operates an ambient air-monitoring network to determine compliance with the NAAQS and with state air quality standards. In addition, the Nebraska network includes a site for monitoring regional haze impacts that is part of a national program to help protect visibility in our National Parks and Monuments.

Three agencies are involved in the day-to-day operation of the network: NDEE, Lincoln-Lancaster County Health Department, and Douglas County Health Department. Omaha Air Quality Control (part of the Omaha Public Works Department) also provides technical support for network-related activities.

The Nebraska monitoring network includes sites at which air quality is monitored to evaluate attainment with the standards and other health- and welfare-associated priorities. The Department evaluates the adequacy of its monitoring network in accordance with federal regulations each year. Changes may be made to the network due to changes in monitoring regulations, updates to the ambient standards, perceived changes in pollution trends, and/or funding issues. Loss of site access is another consideration that occasionally affects the network.

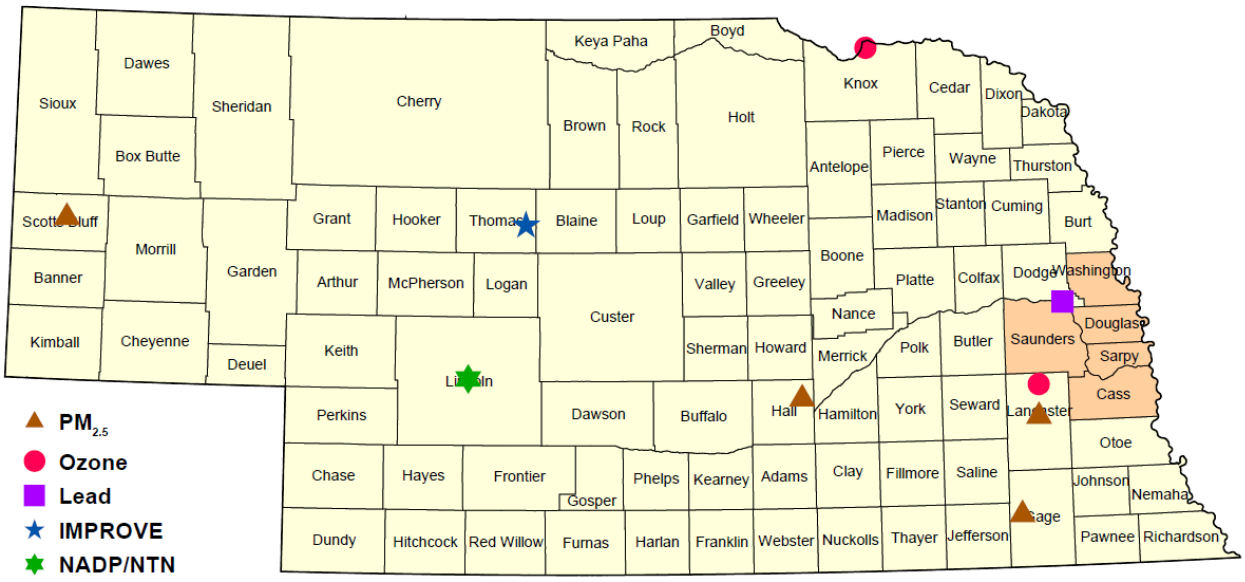
Most of the sites in the monitoring network evaluate pollutants for which standards are established *(i.e.*, $PM_{2.5}$, PM_{10}, CO, SO_2, Lead, or Ozone). Some sites monitor for more than one pollutant. The NCore site in Omaha is part of a National Core Network that monitors for nine pollutant parameters. There are two additional types of sites in the network: Interagency Monitoring of Protected Visual Environments (IMPROVE) and National

Atmospheric Deposition Program/National Trends Network (NADP/NTN) sites. See the following maps for locations.

IMPROVE monitors provide information for studying regional haze that may impact the visibility in listed federal Class I National Park and Wilderness Areas. There is one IMPROVE monitoring site at Nebraska National Forest at Halsey, Nebraska. This site provides data on pollution trends and transport.

The National Trends Network (NTN) of the National Atmospheric Deposition Program (NADP) is a nationwide network of sites that monitor for pollutants deposited by precipitation. The deposition constituents examined include acidity, sulfates, nitrates, ammonium chloride, and base-cations (e.g., calcium, magnesium, potassium, and sodium). There are two NADP/NTN sites in Nebraska: one near Mead and one near North Platte, which have both been operational for over 20 years. These sites are operated by the University of Nebraska, with analytical and data development support from the NADP. The Mead site was upgraded to include mercury (Hg) deposition monitoring and is part of the NADP/Mercury Deposition Network (MDN). Both sites maintain the NADP monitoring. Additional information about the NADP/NTN can be found at http://nadp.slh.wisc.edu.

Nebraska Monitoring Sites Outside of the Omaha Metropolitan Statistical Area



$PM_{2.5}$
Lincoln (Lancaster County)
Grand Island (Hall County)
Scottsbluff (Scotts Bluff County)
Beatrice (Gage County)

Ozone
Davey (Lancaster County)
Santee (Knox County)

Lead
Fremont (Dodge County)

IMPROVE
Nebraska National Forest (Thomas County)

NADP/NTN
Maxwell (Lincoln County)

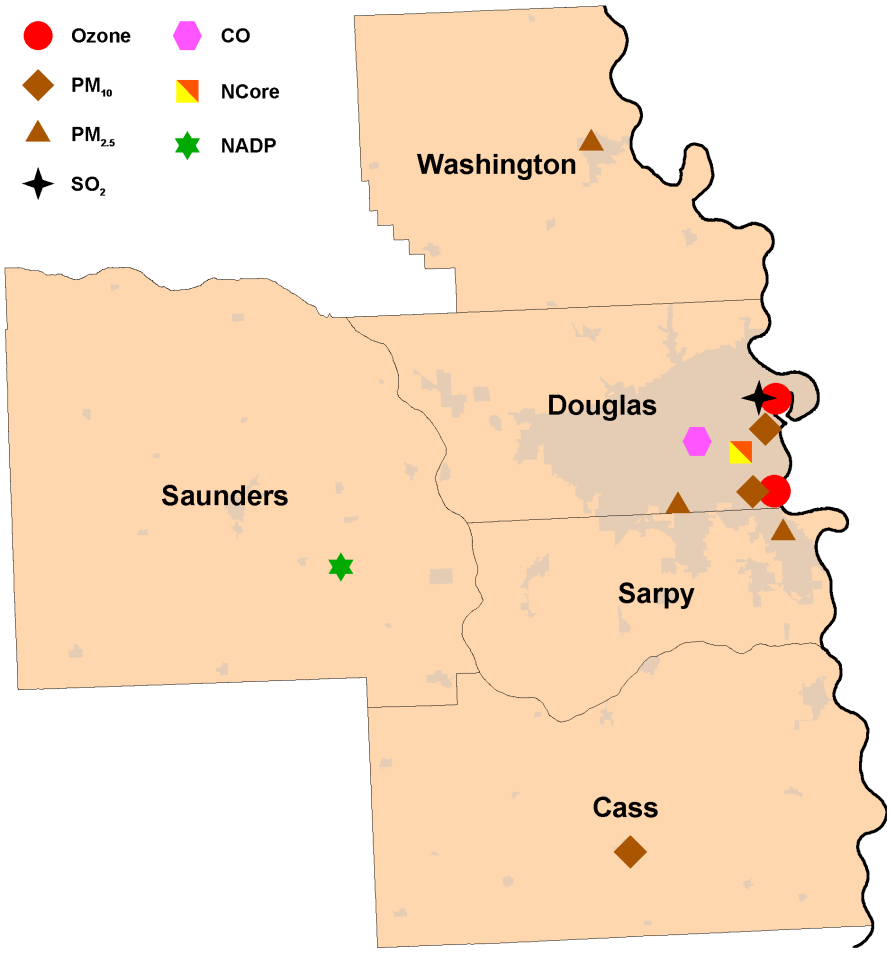
The Nebraska counties in the Omaha-Council Bluffs Metropolitan Statistical Area are indicated by orange shading.

The state map above shows the nine monitoring sites that are located outside of the Omaha-Council Bluffs Metropolitan Statistical Area (counties shown in orange). Four of these sites are operated by the Department, either directly or under contract. The three sites in Lancaster County are operated by the Lincoln-Lancaster County Health Department with NDEE oversight. The National Atmospheric Deposition Program site near North Platte is operated by

the University of Nebraska. An additional ozone site near Santee in northeast Nebraska is operated by the U.S. EPA.

The following map shows the location of the monitoring sites in the Nebraska portion of the Omaha-Council Bluffs Metropolitan Statistical Area (two sites monitor two pollutants and are represented by overlapping pairs of symbols). Nine of these sites, located in Douglas, Sarpy, and Washington Counties, are operated by the Douglas County Health Department with oversight by the Department. A PM_{10} site in Weeping Water in Cass County is operated by NDEE. The National Atmospheric Deposition Program site at Mead is operated by the University of Nebraska.

Monitor Locations in the Nebraska Portion of the Omaha-Council Bluffs Metropolitan Area



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

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

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

In May 2021, NDEE established a new $PM_{2.5}$ monitoring site at Homestead National Historical Park a few miles west of Beatrice. This site will provide continuous measurement of fine particulates from various sources, including smoke from wildfires and prescribed burns.

At the end of 2020, SO_2 monitoring sites in north Omaha and southwest Lancaster County were permanently closed. These sites were established at the beginning of 2017 to measure air quality adjacent to coal-fired electrical generating plants. Closure was approved by EPA because three years of monitor data demonstrated that SO_2 levels at these sites were well below the NAAQS and did not warrant further monitoring.

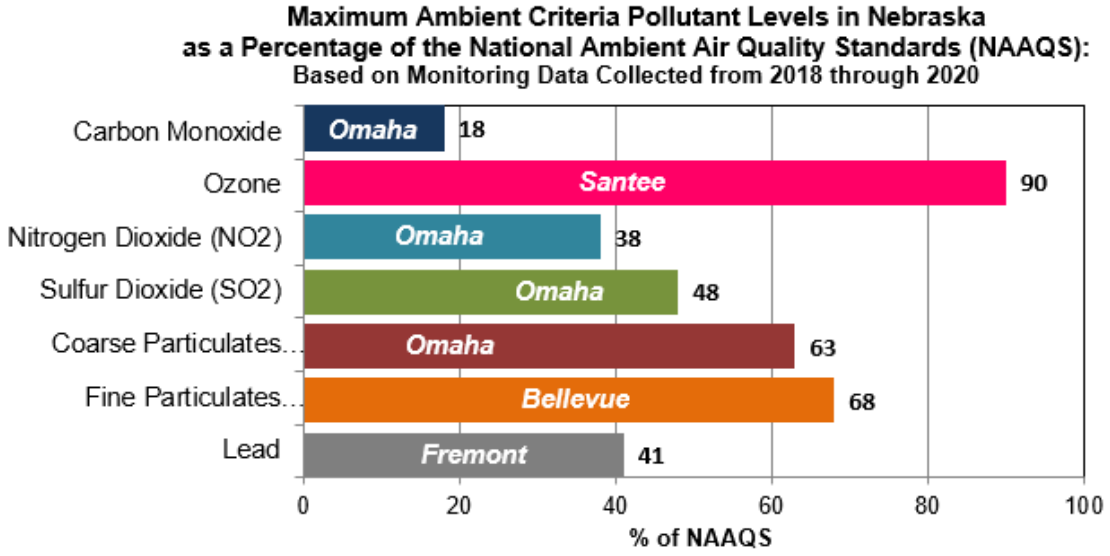
Two monitoring sites are temporarily closed at the request of the property owners at each site: a combined ozone and PM_{10} monitoring site in south Omaha and the lead monitoring site in Fremont. NDEE and the Douglas County Health Department are working to find new locations for these sites.

Monitoring Information Online

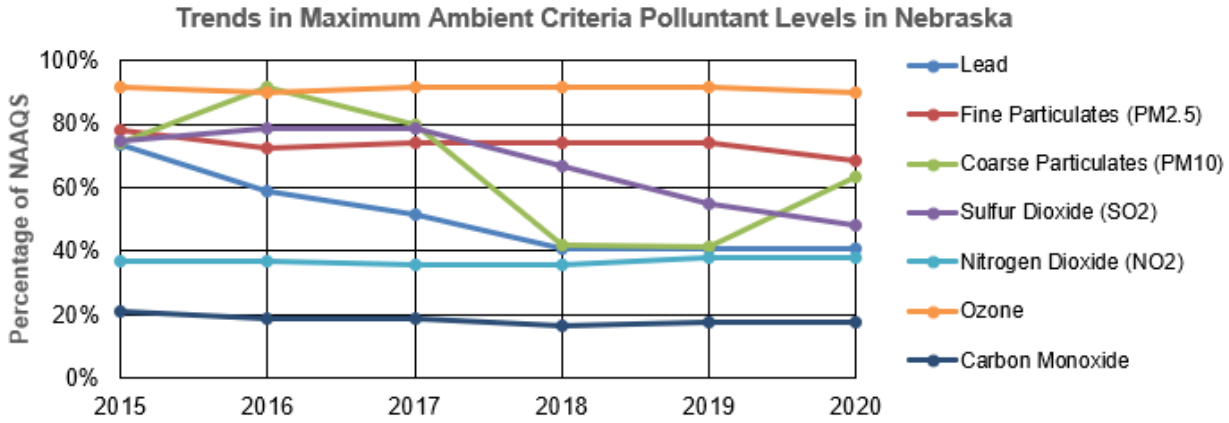
Data from continuous ozone and $PM_{2.5}$ monitors in Lincoln, Omaha, Grand Island, and Scottsbluff are reported hourly to the EPA AirNow system, which makes current air quality information available to the public on the web at http://www.airnow.gov. EPA uses the data to calculate an hourly Air Quality Index (AQI) for each monitor location. The AQI is a numeric rating of the current air quality that provides the public with a quick and simple means to evaluate current air quality in each metro area. The Douglas County Health Department and Lincoln-Lancaster County Health Department websites provide links to current AQI values for their cities. The Douglas County Health Department also participates in the ENVIROFLASH program that allows members of the public to sign up to receive air quality alerts via email. The new Beatrice $PM_{2.5}$ monitor will also report hourly data to AirNow after installation of required telecommunications equipment.

Compliance with National Ambient Air Standards (NAAQS)

Current air quality monitoring data shows that all areas of Nebraska are in attainment (in compliance) with the NAAQS. The chart on the next page shows where the highest air pollutant levels are being detected in Nebraska for each criteria pollutant and how their levels compare to the NAAQS. A reading of greater than 100% would mean that the NAAQS standard was exceeded, but the highest readings for all criteria pollutants are well below 100%.



EPA issued final designations of "Attainment/Unclassifiable" with respect to the NAAQS for sulfur dioxide for two Nebraska counties in 2021: Douglas County in April and Lancaster County in July. These counties include coal-fired power plants in North Omaha and near Hallam, respectively. Designations for these areas are based on data from two source-specific sulfur dioxide monitoring sites operational from 2017-2020, which demonstrate that sulfur dioxide levels at these locations are in attainment/compliance with the NAAQS. EPA had previously designated all other Nebraska counties as "Attainment/Unclassifiable" with respect to the SO_2 NAAQS.



The chart above shows trends in the maximum measured levels of criteria pollutants in Nebraska from 2015 through 2020. The value for each pollutant and year is the maximum measured at any monitoring site in the state (as a percentage of the NAAQS for that pollutant). Ozone is the criteria pollutant of most concern, as maximum levels have remained above 90% of the NAAQS at a number of urban and rural monitor sites in Nebraska as well as in the adjacent states. Levels for ozone, NO_2, CO, and $PM_{2.5}$ have remained fairly constant or have declined slightly since 2015, while the maximum SO_2 level has decreased significantly since 2017. The level and location of the maximum PM_{10} readings have fluctuated widely during this period.

The Department compiles an annual Ambient Air Monitoring Network Plan that provides a more detailed analysis of ambient air monitoring data, pollutant trends through time, and NAAQS compliance. These reports are available on the Department website: http://dee.ne.gov/Publica.nsf/Pubs_Air_Amb.xsp.

Inspections and Facility Compliance

The Compliance Program is responsible for conducting compliance inspections of air pollution sources, responding to citizen complaints, observing and evaluating emission tests, and the acid rain program. Consistent with the Nebraska Environmental Protection Act, the Air Quality Program attempts to obtain compliance with environmental regulations first through voluntary efforts. Voluntary compliance has helped bring about a better working relationship with the regulated community without sacrificing environmental quality. However, enforcement actions are pursued by the Department when compliance issues are serious, chronic or cannot otherwise be resolved.

When the Covid-19 pandemic hit, the Air Quality Program had to adjust how inspections were conducted. In early June 2020 the progarm implemented a virtual inspection process that was able to meet the EPA compliance monitoring strategy (CMS) requirements. The table below lists the compliance activities conducted by the Department during the year.

State FY2021 Compliance Activity Summary

Compliance Activity	NDEE
On-site Inspections	290
Facility Stack Tests Conducted On-site Observations Conducted	75 33
Continuous Emission Monitoring Audits Conducted On-site Observations Conducted	32 15
Complaints Received	77
Burn Permits Issued Burn Permits Denied Burn Permits Withdrawn	91 1 1

Emission Inventory and Emission Fees

Each year the Department conducts an inventory of emissions from major industrial sources and a representative sample of lower-emitting minor industrial sources. Emission inventories are due on March 31 each year for the previous calendar year. Every three years, the Department assists the EPA in preparing a comprehensive national inventory of emissions. The next national inventory compiled will include emissions reported by our sources for 2018, 2019, and 2020. The emissions inventory is used to support the planning efforts for national rulemaking and to assess trends in emissions through time.

The Department also uses the emission inventories to determine the assessment of annual emission fees. Facilities that emit major sources of air pollution are required to pay

emission fees for each ton of pollutant emitted during the previous calendar year. The maximum emission for which a fee is assessed is 4,000 tons per pollutant. For electrical generating facilities with a capacity between 75 and 115 megawatts, the maximum emission for which a fee is assessed is 400 tons per pollutant. The Department attempts to set the fee rate at the minimum level needed to pay reasonable direct and indirect costs of developing and administering the air quality permit program. An analysis detailing how the Department arrived at the fee rate is made available to fee payers. The rate for emissions generated in 2020 was $50 per ton, a reduction from $65 per ton for the 2019 calendar year.

The Department transitioned to a new online reporting system called State and Local Emissions Inventory System (SLEIS) for the 2019 calendar year. During the 2020 reporting period there were still many lower emitting sources reporting to the new system for the first time. Training sessions for those new to the system were conducted throughout 2020 and have continued into the current year.

Planning for Air Quality Issues in Nebraska

EPA periodically reviews the NAAQS using the most recent scientific information available and revises or retains the standards as appropriate. When a new, revised or retained standard is issued, states must determine if they are in attainment with the standard and, if they are not, take the necessary corrective action. States must also submit to EPA their recommendations for attainment or nonattainment designations and State Implementation Plans (SIPs) for each new or revised standard. A SIP describes how the Department will implement, maintain, and enforce a standard.

At the present time, Nebraska is in attainment with all of the NAAQS. Planning activities are currently in progress to address regulatory issues concerning state Air Quality regulations (Title 129), Regional Haze and the Municipal Solid Waste Landfill Rule.

Sulfur dioxide (SO_2)

The 2010 sulfur dioxide (SO_2) standard requires states to demonstrate attainment in the areas surrounding large sources of the pollutant. EPA finalized the Data Requirements Rule (DRR) in 2015 to assist in implementation of the 2010 standard, requiring state air agencies to characterize the air quality near sources that emit 2,000 tons per year or more of SO_2. Nebraska chose to comply with this requirement using both air quality monitoring and pollutant dispersion modeling. Sources in Nebraska subject to this rule include coal-fired power plants, specifically Whelan Energy Center (Adams County), Sheldon Station (Lancaster County), North Omaha Station (Douglas County), Gerald Gentleman Station (Lincoln County), and Nebraska City Station (Otoe County).

Areas surrounding Gerald Gentleman Station and Nebraska City Station were characterized by modeling, and EPA designated them as “Unclassifiable/Attainment” in 2016. The area surrounding Whelan Energy Center was also characterized by modeling and was designated as “Attainment/Unclassifiable” by EPA in 2018. (Starting in 2018, EPA changed the designation “Unclassifiable/Attainment” to “Attainment/Unclassifiable” to emphasize that these areas are in compliance with current air quality standards.) The remaining areas around Sheldon Station (Lancaster County) and North Omaha Station (Douglas County) were characterized using data from ambient air monitors operated from 2017-2019. Monitoring data demonstrated compliance

with the NAAQS in both areas, and EPA designated Douglas County and Lancaster County as "Attainment/Unclassifiable" in April 2021 and August 2021, respectively.

The DRR requires annual reporting (termed "ongoing requirements") for areas characterized by modeling, and this year's report was submitted as part of the Nebraska 2021 Ambient Air Monitoring Network Plan in July 2021. Two facilities are subject to these ongoing requirements: Whelan Energy Center and Gerald Gentleman Station, though another facility (Nebraska City Station) was addressed in this year's report due to a slight increase in emissions. Facility emissions data indicate that all areas continue to demonstrate attainment with the federal standard.

A SIP revision addressing interstate transport of SO_2 was submitted to EPA in October 2020, and demonstrates that emissions from Nebraska sources do not interfere with adjacent states' ability to maintain or comply with the NAAQS. EPA issued its full approval of the plan in August 2021.

In April 2019, EPA retained the current primary (health-based) SO_2 NAAQS.

Ozone

EPA issued revised ozone standards in 2015, lowering the standard from 0.075 parts per million (ppm) to 0.070 ppm. In November 2017 EPA designated the entire state of Nebraska as "Unclassifiable/Attainment". EPA approved Nebraska's SIP revision for ozone in April 2020. In December 2020, following a review of the standard, EPA retained the current NAAQS.

Particulate Matter

In April 2020, EPA proposed to retain the current NAAQS for particulate matter (PM), including both fine particles ($PM_{2.5}$) and coarse particles (PM_{10}), issuing its final rule in December 2020 to retain the current standards. In June 2021, EPA announced that it will reconsider the 2020 final rule based on evidence that current standards may not be adequate; it expects to issue proposed rulemaking in the summer of 2022.

Regional Haze

Regional Haze refers to impaired visibility at national parks and wilderness areas caused by particulates and industrial gases in the atmosphere. EPA issued the Regional Haze Rule in 1999 to improve visibility in these areas. The rule requires that state and federal agencies work together to achieve this goal. Numerous amendments to the Rule have been issued addressing the Cross-State Air Pollution Rule (CSAPR) as an alternative to Best Available Retrofit Technology (BART) for particular pollutant sources, and regulatory requirements for SIPs. In addition, guidance and technical support documents are available to assist states in preparing SIPs for the second implementation period (2018-2028).

Nebraska submitted its Regional Haze SIP for the first implementation period (2008-2018) in July 2011; in 2012, EPA issued a partial approval/partial disapproval of the SIP. The disapproved portions include the BART determination for sulfur dioxide for Gerald Gentleman Station and the state's long-term strategy for regional haze insofar as it relied on the BART determination. EPA issued a Federal Implementation Plan (FIP) that relies on the Cross-State Air Pollution Rule (CSAPR) to satisfy BART for sulfur dioxide at Gerald Gentleman Station. The remaining disapproved portion (long-term strategy) will be

addressed in the forthcoming SIP revision. This source participates in the CSAPR trading program, which allots each source an emissions budget for SO_2 and permits trading of allotments. To date, no additional control measures have been required.

The Department submitted its Regional Haze Five-Year Progress Report in April 2017. At present, the program is developing its SIP revision for the second implementation period, which was due to EPA in July 2021. This SIP revision will address portions of the initial SIP and progress report, as well as state obligations for the current implementation period.

Affordable Clean Energy Rule

In July 2019, EPA finalized the Affordable Clean Energy (ACE) Rule as a replacement for the Clean Power Plan. This rule includes three separate rule-makings: 1) repeal of the Clean Power Plan; 2) establishment of emission guidelines for states to use when developing plans to limit greenhouse gas emissions at power plants and 3) determination that heat rate improvement is the best system for reducing greenhouse gas emissions from coal-fired power plants. The Affordable Clean Energy Rule was vacated in January 2021. NDEE has put this plan on hold.

Municipal Solid Waste Landfill Plan

On May 21, 2021, EPA finalized the federal implementation plan for municipal solid waste landfills (MSWL). The plan supports the following federal rule located at 40 CFR Part 60 Subpart Cf: Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills. The emission guidelines apply to landfills that were constructed prior to July 17, 2014 and accepted waste after November 8, 1987. This new emission guideline lowers the threshold for which facilities must install gas collection and control equipment from 50 Mg/yr to 34 Mg/yr of nonmethane organic compounds (NMOCs). NDEE is working with EPA on implementation of the federal plan while the agency develops a state implementation plan.

Air Toxics Program

EPA currently lists 187 substances as hazardous air pollutants, or air toxics, which are air pollutants known to cause cancer and other serious health impacts. The Department developed the Air Toxics Notebook on the Department website as a reference on the air toxics program. In addition, the Department also developed another set of web pages for the New Sources Performance Standards (NSPS), which are federal rules that apply largely to new stationary sources. Both sets of rules have been issued by EPA. The Notebooks are intended to help the regulated community and the public understand the air toxic and NSPS regulations. For each standard the Notebook has a page that provides applicability information, regulatory citations, amendment dates, guidance documents, forms, and a listing of sources in the Department's jurisdiction that are subject to each NESHAP or NSPS rule.

Smoke Awareness Program

Prescribed fires and wildfires impact Nebraska's air quality and have received increased attention over the past several years. In early to mid-spring, ranchers and land managers burn an average of 2.3 million acres of tallgrass prairie in the Flint Hills of Kansas to control invasive plant species and to encourage growth of pasture grasses. Unpredictable spring weather conditions may provide only a few days of optimal weather for burning, which can result in widespread burning and large amounts of smoke on those days. Wind from the south is typical during the spring and Nebraska can experience air quality impacts (elevated fine particulates, known as $PM_{2.5,}$ and ozone) for 24-48 hours following these events. Rangeland prescribed burning and wildfires also occur in Nebraska, though fewer acres are burned.

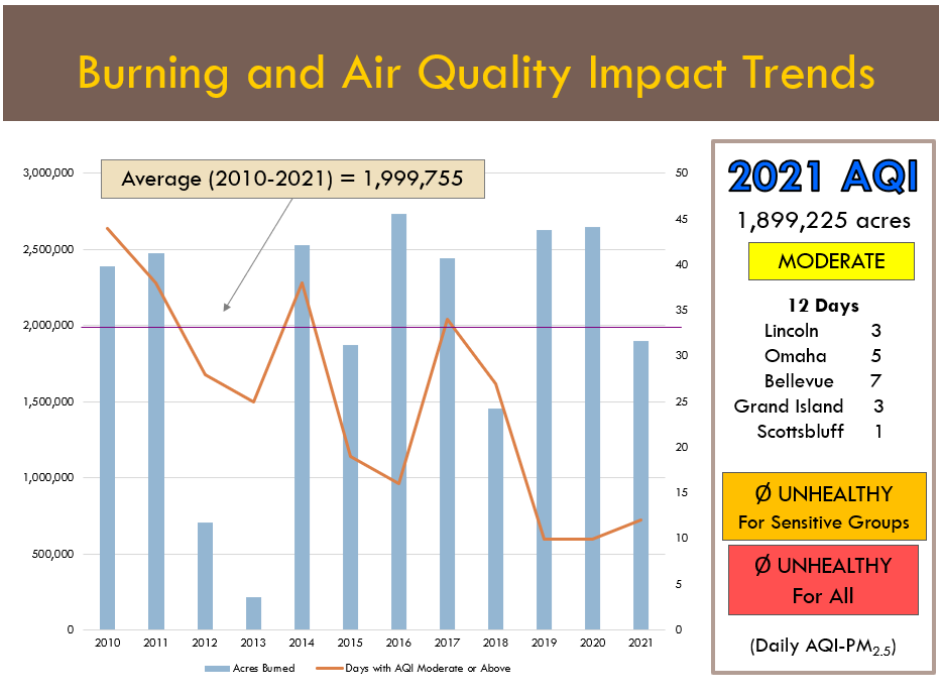
Impacts on air quality in Nebraska from wildfires are garnering more interest due to severe wildfire seasons and drought conditions in western states and Canada over the past 2-3 years. It is becoming more common to experience impacts that persist over several days due to heavy smoke from these fires that often impact air quality in much of the United States.

Collaborative efforts with key stakeholder agencies continued in 2021 and included pre- and post-season virtual meetings in February and June 2021, respectively. Participants included a number of local health Departments, the Nebraska Game and Parks Commission, University of Nebraska Agronomy-Horticulture program researchers, and land managers who rely on prescribed fire as a management practice. Other activities included communicating about potential smoke and air quality impacts, consulting on the scope and extent of smoke advisories, and planning for future burn seasons.

Tasks performed by NDEE staff during the 2021 burn season included:

- Monitoring air quality ($PM_{2.5}$ and ozone levels)
- Generating maps showing fire locations and smoke plumes
- Reviewing weather and smoke forecasts, prescribed fire and smoke updates from Kansas, and smoke prediction models
- Updating the NDEE Smoke Awareness webpage with current information on smoke impacts and pollutant monitoring
- Conducting conference calls with stakeholders to determine the likelihood for smoke impacts and to generate advisories for the public
- Providing email updates to stakeholders on air quality conditions and wildfire conditions
- Interpreting and deploying National Weather Service software technologies.

Agency staff coordinate and consult with other stakeholder agencies on days when heavy burning and smoke impacts are predicted. If a health advisory is warranted, staff coordinated with the Nebraska Department of Health and Human Services (DHHS) to issue a Smoke Advisory to the public. Smoke Advisories were issued in 2021 for March 28-29, April 1-2, July 29-Aug 1, August 3-4, and August 10-12.



During the 2021 burn season, Nebraska experienced a total of 12 days with an Air Quality Index (AQI) for fine particulates ($PM_{2.5}$) in the *Moderate* range (18% of days) as noted in the chart above, and six days with an AQI for ozone in the *Moderate* range . The *Moderate* range is characterized by pollutant levels at or above the National Ambient Air Quality Standards for a 24-hour period, which may induce health effects in those who are unusually sensitive to fine particulates or ozone. The Unhealthy for Sensitive Groups range is characterized by pollutant concentrations which may induce health effects in those who are sensitive as opposed to unusually sensitive to air pollution. In comparison, Nebraska experiences daily AQI levels in the *Moderate* category for $PM_{2.5}$ on about 24% of days outside of the burn season.

There were no days during the 2021 burn season in which the daily AQI values in Nebraska were in the *Unhealthy for Sensitive Groups* or *Unhealthy for All* category, as was the case in 2018 and 2019. Burn seasons in previous years (2010-2020) averaged about one day per year in the *Unhealthy for Sensitive Groups* category.

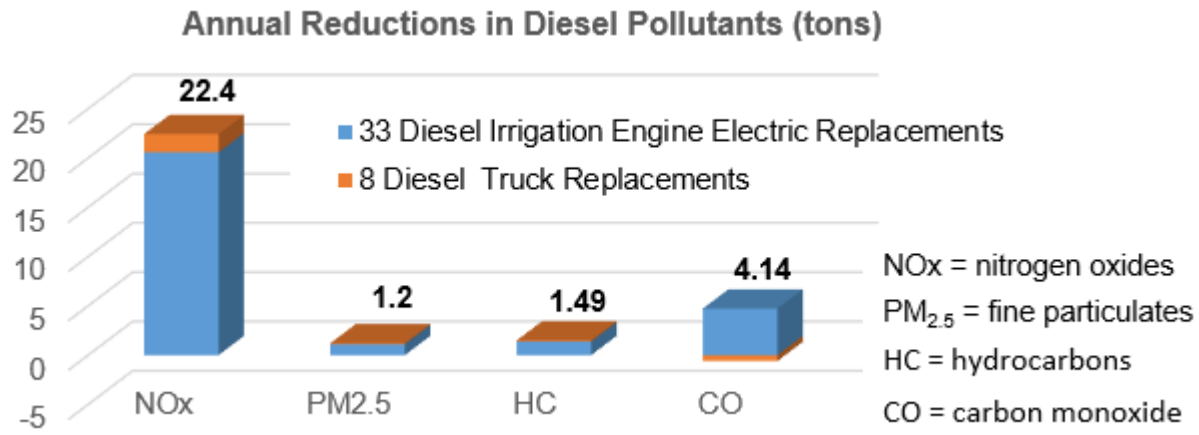
The activities conducted with other agencies in 2021 resulted in timely health advisories and notification to the public of potential air quality impacts from prescribed burning. Predictions of potential impacts, while cautious, were fairly accurate. The flow of information continues to improve, and a standardized process for dissemination of advisories is in place.

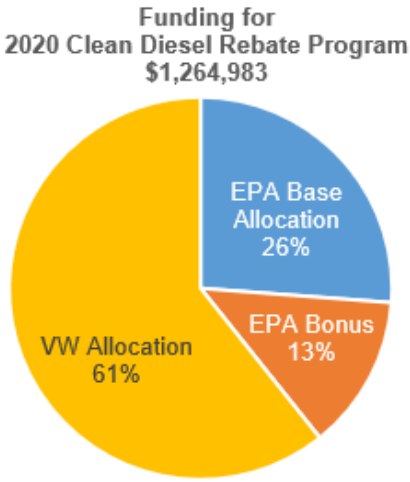
It should be noted that while both prescribed burning and wildfires affect localized air quality, Nebraska remains one of the few states to comply with all federally established National Ambient Air Quality standards.

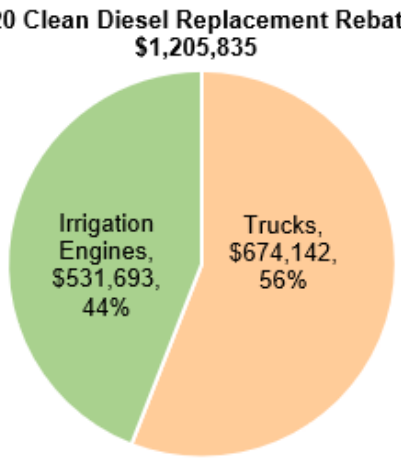
Nebraska Clean Diesel Rebate Program

The Department established the Nebraska Clean Diesel Program in 2008 to distribute federal funding received from the EPA to reduce diesel emissions, as authorized by Congress in the Diesel Emissions Reduction Act (DERA). The DERA program provides annual funding to states for the establishment of grant, rebate, and loan programs for the early replacement of diesel engines and vehicles and the installation of diesel emission controls. Starting in 2017, NDEE has elected to supplement the federal grant with funds from Nebraska's portion of the *Volkswagen Diesel Emissions Environmental Mitigation Trust* (*VW Trust*; see next section), which earns bonus EPA funding.

For the Clean Diesel Rebate Program annual funding cycle that opened in October 2020, NDEE has awarded or expects to award $1,205,835 in rebates to 38 projects. The two types of projects funded are diesel truck replacements (eight trucks) and all-electric replacements of 33 diesel irrigation engines. The truck replacement rebates reimburse 25% of the cost (maximum $70,000) of a new diesel vehicle or 35% (up to $120,000) for a new compressed natural gas (CNG) vehicle meeting emission standards for nitrogen oxides that are stricter than the current EPA standard. The irrigation engine rebates are for replacement of a diesel irrigation engine with an electric motor (to power a surface pump) or for connecting an existing submersible pump directly to the electric grid. The rebate reimburses up to 60% of the cost of the electric equipment, installation, and required extension of electric service lines. All replaced diesel vehicles and engines must be scrapped in order to eliminate their emissions. Estimated annual reductions in diesel pollutants as a result of these replacement projects are shown below.







2020-2021 Refuse Truck Replacement Rebates: $674,142

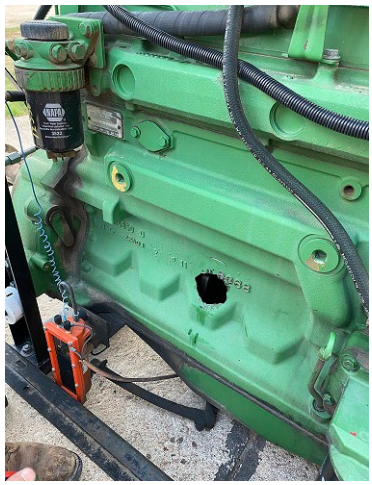
Name	Location	Replacement	Rebate Amount
City of Lincoln Fleet Services	Lincoln	2 Diesel Plow Trucks	$133,049
Gretna Sanitation	Gretna	1 CNG Refuse Truck	$120,000
Soil Dynamics Composting Farm	Springfield	1 Diesel Truck Cab	$69,120
Uribe Refuse Services	Lincoln	2 CNG Refuse Trucks	$207,578
Metropolitan Utilities District	Omaha	2 CNG Utility Trucks	$144,395

2020-2021 Irrigation Engine Replacement Rebates: $531,693

Name	County	Replacement	Rebate Amount
Brozek & Sons, Inc.	Antelope	Electric motor	$20,000
Carpenter, Jerry	Antelope	Electric motor	$14,926
Filkins, JoAnn	Antelope	Electric motor	$20,000
Filkins, Mark	Antelope	Electric motor	$15,764
Godeken, Steve	Keith	Electric motor	$19,960
Holm, Eugene	Lincoln	Electric motor	$13,604
Jorgenson, Neil	Custer	Electric motor	$11,965
Klabenes Land and Cattle	Antelope	Electric motor	$14,679
Klabenes Trucking	Antelope	Electric motor	$10,663
Klabenes, Marvin	Antelope	Electric motor	$10,697
Klabenes, Matt	Antelope	Electric motor	$14,163
Klabenes, Stacy	Antelope	Electric motor	$11,760
Larson, John	Boone	Electric motor	$12,638

McDonald, Dennis	Antelope	Electric motor	$14,055
MTC Properties LLC	Lincoln	Electric motor	$20,000
Mulliken Farms	Dodge	Electric motor	$13,902
Nelson, Leon	Howard	Electric motor	$20,000
Nelson, Ross	Madison	Electric motor	$12,132
Nikkel, Cole	Perkins	Electric motor	$20,000
Ox Hoof LLC	Holt	Electric motor	$20,000
Panowicz, John	Hall	Electric motor	$17,444
Panowicz, Mike	Hall	Electric motor	$20,000
Pellatz, Tim	Antelope	Electric motor	$15,270
Peterson, David M.	Holt	Electric motor	$19,020
Peterson, Miles	Greely	Electric motor	$20,000
Rohde, Keith	Madison	Electric motor	$11,698
Ro-Jon, Inc.	Keith	Electric motor	$20,000
Siffring Living Trust	Keith	Electric motor	$14,722
Stanley, John R.	Deuel	Electric motor	$20,000
Sunderman, Randy	Madison	Electric motor	$14,416
TJK Farms	Antelope	Electric motor	$20,000
Trambly, Nelson	Franklin	Electric motor	$16,823
Werkmeister, Joe	Frontier	Electric motor	$17,837


Old diesel engine to be scrapped.


Scrapped engine with hole.


New electric motor at wellsite.

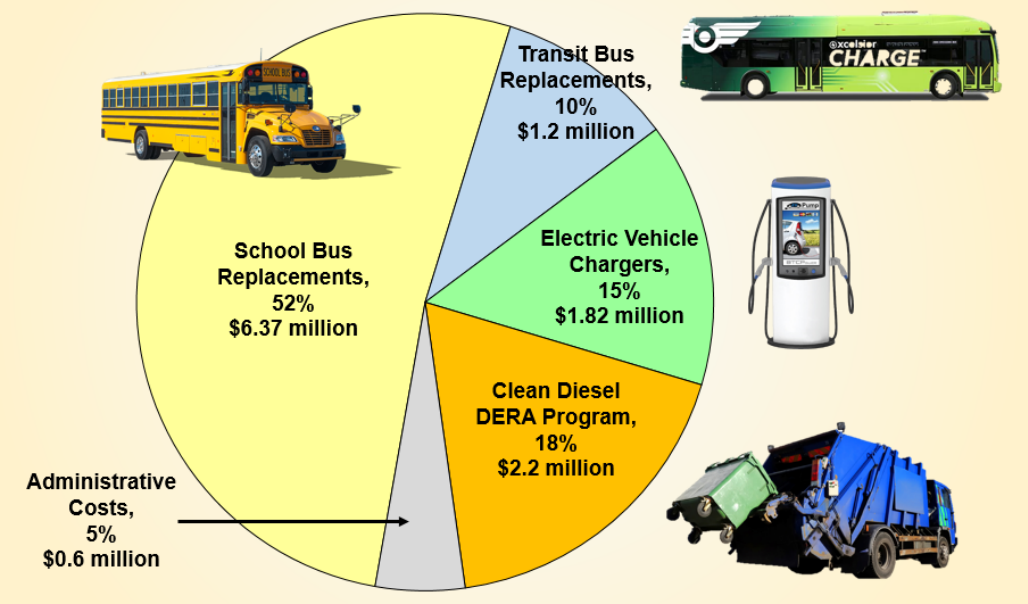
Photos courtesy of Robert D. Nelson, Ro-Jon Inc., Ogallala.

Volkswagen State Trust Activities

NDEE is the lead agency administering funds allocated to Nebraska from the *Volkswagen Environmental Mitigation Trust for State Beneficiaries, Puerto Rico, and the District of Columbia* (VW State Trust). The VW State Trust was established in 2017 as part of court settlements with Volkswagen AG and its subsidiaries to resolve charges that their diesel passenger vehicles were equipped with devices to circumvent emissions testing and allow them to emit excess nitrogen oxide gases in normal operation, in violation of the Clean Air Act. The initial allocation to Nebraska from the VW State Trust is approximately $12.25 million. As directed by the Trust Agreement, these funds are to be used to undertake authorized actions to reduce nitrogen oxide (NOx) emissions in Nebraska.

Beneficiary Mitigation Plan

In April 2020, NDEE submitted a revised Beneficiary Mitigation Plan that summarizes how Nebraska intends to use the funds allocated to it under the Trust. The table and figure below present the project types selected for funding in Nebraska and the percentage of funds expected to be allocated to each type.



Planned Allocations of VW State Trust Funds by Mitigation Action

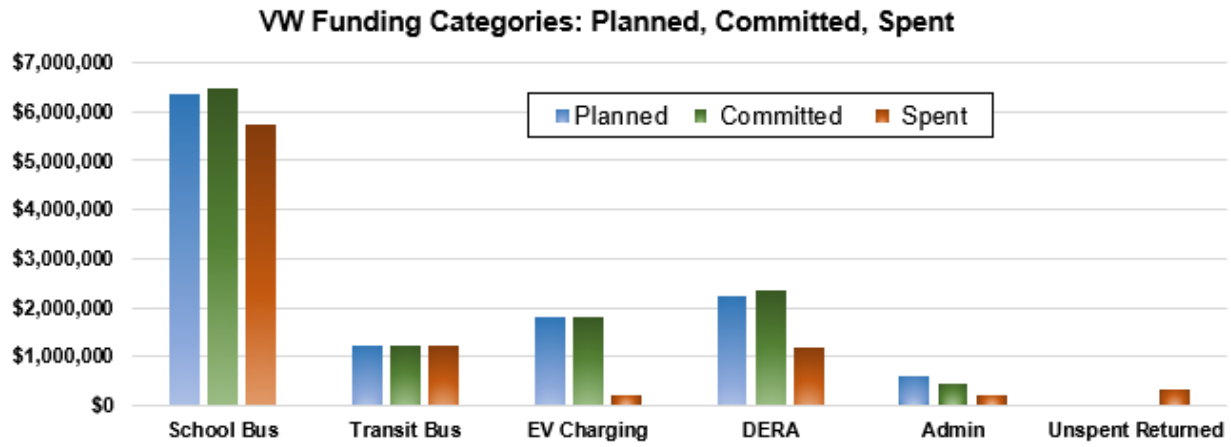
Action	Percent	Dollars
Transit Bus Alternative Fuel Replacements	10%	$1,224,835
School Bus Diesel & Propane Replacements	52%	$6,369,141
Zero Emission Vehicle (Electric Vehicle) Charging Infrastructure	15%	$1,818,224
DERA: Irrigation engine & refuse Truck Replacements	18%	$2,223,729
Administrative Costs*	5%	$612,417
TOTAL	100%	$12,248,347.48

* The Trust agreement allows reimbursement of administrative costs up to 15% of each funded project.

Nebraska's Beneficiary Mitigation Plan is intended to provide the public with insight into the Department's intentions for the use of the mitigation funds and information about the specific uses for which funding is expected to be requested. Nebraska may adjust its goals and specific spending plans at its discretion by providing an updated Beneficiary Mitigation Plan to the Trustee. Each state beneficiary must expend at least 80% of its initial allocation by October 2, 2027; otherwise, the unexpended funds will be reallocated to other beneficiaries that have complied with that guideline. The Department has set a goal of expending Nebraska's share of the funds by the end of 2023.

Nebraska Diesel Emission Mitigation Program

NDEE established the Nebraska Diesel Emission Mitigation Program to use VW State Trust funds for projects to mitigate NOx emissions in Nebraska, and has carried out projects in all of the categories laid out in the Beneficiary Mitigation Plan. As of the end of State Fiscal Year 2020, NDEE has requested Trust funds for nine programs and expended $8,554,633 of those funds. The distribution of spending in the different project categories is shown in the chart below.



NDEE's Beneficiary Mitigation Plan set a goal to limit administrative costs to no more than 5% of Trust funds spent. To date only 2.3% of Trust funds spent have been for administrative costs. During this fiscal year NDEE returned $319,709 in unspent funds from four programs to Nebraska's account with the State Trust, as required by the trust agreement. These returned funds are available for future projects.

During the fiscal year the Department completed two programs: the Transit Bus Alternative Fuel Replacement program initiated in 2018 and the 2019 School Bus Rebate Program. The City of Lincoln was reimbursed for replacing two older diesel transit buses with two battery-electric buses, part of an order of ten buses to begin the conversion of the Lincoln StarTran fleet to electric vehicles.

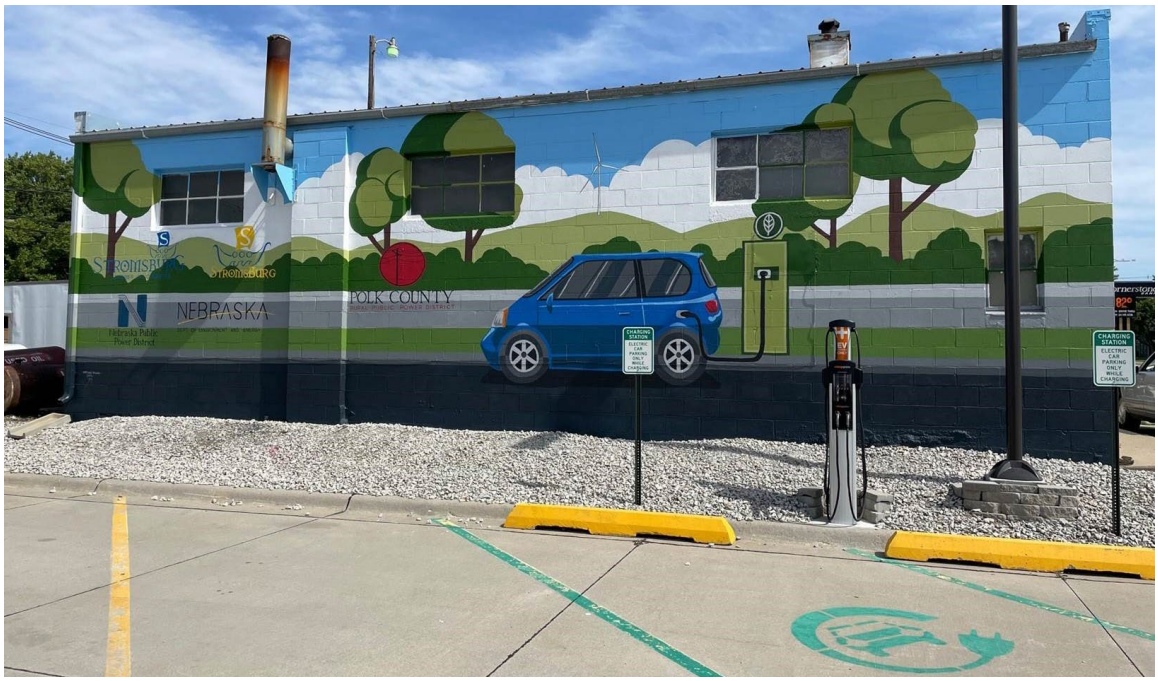
One of two Lincoln StarTran electric transit buses partially funded through the NDEE Transit Bus Alternative Fuel Replacement Program.

The completed 2019 School Bus Rebate program reimbursed 65 school districts a total of $2,633,926 for the purchase of new buses to replace older diesel school buses, which were scrapped to eliminate their diesel emissions. Eleven of the new buses were equipped with low-NOx propane fueled engines, which have NOx emissions 90% lower than new diesel buses.

Electric Vehicle Charging Rebates

The Nebraska 2019 Electric Vehicle Charging Rebate Program provided financial incentives to municipalities and businesses to encourage installation of electric vehicle charging stations to serve light-duty electric vehicles in Nebraska. The program awarded rebates for 28 projects for the installation and maintenance of Level 2 and Direct Current (DC) Fast Charging equipment at public and workplace locations.

During the past year charging equipment has been installed at over 15 new locations in Nebraska, including all six high schools in Lincoln. The first station completed under this program has a Level 2 charger installed in Stromsburg by Polk County Rural Public Power District. An attractive mural on the building wall behind the charger draws attention to this new charging site, as shown in the illustration below.



Level 2 electric vehicle charging station in Stromsburg partially funded through the Electric Vehicle Charging Rebate Program.

A new site recently completed by the Nebraska Public Power District at a travel center adjacent to Interstate 80 south of York has two DC fast chargers (shown in the illustration below) and a Level 2 charger. The DC fast chargers are linked so that one electric vehicle can draw power from both chargers if both are not in use, cutting the charging time significantly.

Two DC fast electric vehicle chargers at the York, Nebraska station installed by the Nebraska Public Power District.

2020 School Bus Replacement Rebates

In SFY2021, the Nebraska Diesel Emission Mitigation Program opened the third and final year of its School Bus Rebate Program and awarded a total of $1,993,604 for the replacement and scrapping of 46 older diesel school buses. School districts were eligible for a 50% reimbursement (up to $42,000) for a new diesel public school bus or 60% of the cost (up to $57,000) for a new propane-fueled public school bus meeting NOx emission standards stricter than the federal standard. Projects were given a completion deadline of December 15, 2021 in anticipation of pandemic-related manufacturing delays.

2020 School Bus Replacement Rebates			
Amherst Public School	$57,000	Mullen Public Schools	$42,000
Banner County School	$42,000	Oakland-Craig Public Schools	$42,000
Bayard Public Schools	$42,000	Ogallala Public Schools	$42,000
Bertrand Community School	$42,000	Osmond Community Schools	$55,753
Bloomfield Community Schools	$41,270	Overton Public Schools	$16,375
Centura Public School	$42,000	Pawnee City Public School District	$42,000
Chambers Public School	$42,000	Perkins County Schools	$42,000
Eustis-Farnam Public Schools	$42,000	Randolph Public Schools	$56,292
Fillmore Central Schools	$42,000	Raymond Central Public Schools	$42,000
Freeman Public Schools	$42,000	Schuyler Community Schools	$42,000
Fremont Public Schools	$42,000	Seward School District	$42,000
Giltner Public Schools	$42,000	Shickley Public Schools	$42,000
Gretna Public Schools	$42,000	Silver Lake Public Schools	$42,000
Harvard Public Schools	$42,000	South Central Nebraska USD #5	$42,000
Hemingford Public Schools	$42,000	Southern Public Schools	$42,000
Hershey Public Schools	$42,000	Stanton Community Schools	$42,000
High Plains Community Schools	$42,000	Stapleton Public Schools	$42,000
Humboldt Table Rock Steinauer Schools	$42,000	Tekamah-Herman Schools	$42,000
Kearney Public Schools	$57,000	Wakefield Community Schools	$42,000
Lyons-Decatur Northeast Public School	$42,000	Wauneta-Palisade Schools	$42,000
Mid States School Bus	$16,947	Waverly School District	$42,000
Minatare Public Schools	$42,000	Wilcox-Hildreth Public School	$42,000
Minden Public Schools	$56,341	York Public Schools	$42,000

Kearney Public Schools' replacement low-NOx propane-fueled school bus partially funded through the 2020 School Bus Rebate Program.

Small Business and Public Assistance Program

The Small Business and Public Assistance program and associated Small Business Compliance Advisory Panel (SBCAP) were created to comply with the Clean Air Act Amendments of 1990 to assist businesses in complying with air quality regulations. However, the Department has provided the same compliance assistance services and support to Water Quality and Land Management Division stakeholders as well, and this support has expanded to include energy programs.

Key activities of the program include developing guidance and outreach materials; responding to outside requests for information; hosting training and informational workshops, webinars, and one-stop meetings to help new businesses determine their permit applicability; expanding partnerships; helping the regulated community understand their obligations under state and federal law; and promoting compliance and permit assistance visits to small businesses and municipalities.

Grow Nebraska Team

NDEE's internal Grow Nebraska Team (GNT), launched in 2018, provides outreach to new businesses proposing operations in Nebraska within 10-days of a request for information, in addition to the services outlined below.

The following summarizes the primary compliance assistance activities offered by the agency.

- Compliance Assistance Visit (CAV): An on-site service offered by NDEE in response to a request by a business or regulated party to receive support for one or multiple environmental program areas to which they are currently subject or considering under proposed operations. Compliance assistance activities (see individual Site Assistance/Training below) may be provided during an inspection; however, a CAV cannot be requested after an inspection that may result in enforcement until that issue is resolved. A CAV focuses on supporting the efforts of an entity to achieve voluntary compliance; however, it does not absolve it from receiving an enforcement action if egregious violations are found during the visit.

- Permit Assistance Visit (PAV): An on-site service (or meeting) offered by NDEE in response to a request by a business or regulated party to receive support under a new, modified or existing permit to address permit related questions.

- One-Stop Meeting: A One-Stop Meeting allows for a newly proposed or expanding business and their selected representatives to engage with applicable NDEE permitting programs and other regulatory agencies. The goal of each meeting is to provide the permittee an opportunity to ask questions and receive direction toward attainment of the necessary permits to achieve environmental regulatory compliance.

- Scoping Meeting: A meeting within or outside of NDEE to introduce a new or proposed business to involved staff, programs and agencies. The meeting may include a review of processes or technologies, tools, resources, and strategic partnerships to assist the business in making the appropriate contacts for applicable regulatory requirements or business needs.

• Individual Site Assistance/Training: An on-site service offered by NDEE in response to a request or during or after a Compliance Inspection.

Key accomplishments for the team during the 2021 FY included:

- Hosted seven webinars on waste reduction and recycling grant opportunities, hazardous waste determinations, upcoming regulation changes, technical assistance to brownfields, source water protection grants, and wastewater lagoons
    - Conducted mini follow-up surveys after webinars that provided immediate customer feedback about the webinar events.
- Added updated permit information and resources to the Permit Matrix. The Matrix assists small businesses with compliance-related topics by sharing links to guidance documents, program overviews, regulations, supporting NDEE web pages, and additional resources.
- Conducted seven multi program-based Compliance Assistance Visits
- Maintained regular engagement with the Nebraska Industrial Council on the Environment (NICE)
- Maintained agency's video events page on the NDEE website with webinar recordings, presentation slide decks, and compilations of answers to webinar participant questions
- Supported NDEE staff to be remote presenters at two separate and distinct conferences pertaining to emergency management and energy.
- Continued social media outreach via Twitter, Facebook, and LinkedIn with monitoring of metrics in conjunction with the Public Information Office

The Department continues to work on improvements to its outreach and assistance processes in the wake of the pandemic; develop standard operating procedures to support remote and in-person outreach events and maintaining the goal to provide necessary support for stakeholders in an effort to make compliance easy.