

St. Maries Airshed PM Advance Program

Path Forward



**State of Idaho
Department of Environmental Quality**



City of St. Maries



June 2021

Acknowledgements

Months of planning went into this project and this would not have been possible without the help and support of the community of St. Maries. Special thanks go to the Idaho Department of Environmental Quality, PotlatchDeltic, and the Coeur d'Alene Tribe for providing funding and technical assistance for our air quality improvement projects. The Advisory Committee members also deserve recognition for the hours they've donated in service to their community. Lastly, thanks to the United States Environmental Protection Agency for continuing to protect the nation's air quality and for sponsoring this program.



Prepared by

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814

City of St. Maries
602 College Ave.
St. Maries, ID 83861



Printed on recycled paper, DEQ, June 2021, PID ASPD, CA code 71194. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Idaho Code § 60-202.

Table of Contents

1	Introduction	1
2	Background	1
3	St. Maries Area Description	2
4	Air Quality	4
5	Pollutant Sources	8
5.1	Emission Inventory Development	8
5.2	Speciation and Source Apportionment	11
6	Community Partners	13
7	Emission Reduction Strategies	13
7.1	Outreach and Education	14
7.1.1	Public Education	14
7.1.2	Media and Social Media Engagement	15
7.1.3	Technology	15
7.2	Voluntary Measures	16
7.2.1	Targeted Woodstove Change-Out	16
7.2.2	Voluntary Open Burning Curtailment	17
7.2.3	Voluntary Road Dust Reduction	18
7.3	Current Regulatory Measures	18
7.3.1	Air Pollution Emergency Rule	18
7.3.2	Rules for Control of Open Burning	18
7.3.3	Rules for Control of Fugitive Dust	19
7.3.4	City of St. Maries Ordinance	19
7.4	Possible Future Regulatory Measure	19
7.5	Implementation Schedule	20
	References	20
	Appendix A. PM Advance Program Participation Letter	21
	Appendix B. St. Maries PM Advance Strategic Communication Plan	23

List of Tables

Table 1. Seasonal distribution of PM_{2.5} daily standard exceedances in the St. Maries airshed (2016–2019). 8

Table 2. St. Maries airshed emissions summary in pounds per winter day. 10

List of Figures

Figure 1. St. Maries airshed. 4

Figure 2. Annual PM_{2.5} design value concentrations at the St. Maries monitor, 2009–2019. 6

Figure 3. Daily PM_{2.5} design value concentrations at the St. Maries monitor, 2009–2019..... 6

Figure 4. Average daily PM_{2.5} concentrations at the St. Maries monitor, 2016–2019, are highest in the winter. 7

Figure 5. Top contributors of PM_{2.5} in the St. Maries airshed—winter emissions inventory. 11

Figure 6. Modeled contributions of different PM_{2.5} sources (%). 12

1 Introduction

Fine particulate pollution has become a concern in the St. Maries area of northern Idaho. During the past 10–15 years, annual concentrations of particulate matter in the area have been increasing gradually. The sources of particulates with the biggest impact on these annual concentrations are backyard burning year-round, prescribed burning in the fall, and wood-burning heating devices in the fall, winter, and spring. The geography of the St. Maries valley creates optimal conditions for long periods of high pressure during the winter months, resulting in lengthy air inversions. When air inversion events occur during the winter, pollutants emitted into the lower atmosphere are trapped, exposing residents to unhealthy air, often for weeks at a time.

The area has exceeded the daily federal health standard for fine particulate matter (PM_{2.5}) in 2015, 2017, and 2018. City leaders and citizens decided participation in the PM Advance Program provides a way for the community to develop an acceptable path toward improving local air quality and quality of life while avoiding more stringent regulation in the event of a future nonattainment designation.

The US Environmental Protection Agency (EPA) launched the Particulate Matter (PM) Advance Program in early 2003. This nonregulatory program encourages collaboration between EPA, states, tribes, and local government to proactively reduce PM_{2.5} emissions in areas struggling to meet the national air quality standards for PM_{2.5}. The program empowers local communities to develop site-specific solutions to air quality problems that fit local needs and goals.

Participating in the voluntary PM Advance Program presents multiple benefits for an area:

- Ensures continued health protection over the long term
- Better positions an area to meet air quality standards and avoid a nonattainment designation.
- Allows for input on control measures and programs that make the most sense for the area and are cost-effective.

This Path Forward describes the efforts of the community to agree on measures and programs to reduce particulate pollution and outlines the actions needed to implement these measures and programs going forward.

2 Background

PM_{2.5} is an air pollutant with particles less than 2.5 micrometers in diameter. It can be directly emitted into the air or formed chemically as other pollutants and chemicals combine in the air. Primary sources of PM_{2.5} include vehicles, factories, construction sites, tilled fields, unpaved roads, sand and gravel used as anti-skid material on roads in winter, residential wood burning, agricultural burning, wildfires, prescribed fires, and natural windblown dust. Secondary PM_{2.5} forms from chemical reactions between nitrogen oxides, sulfur dioxide, ammonia, and volatile organic compounds. The main sources of nitrogen oxides are passenger vehicles as well as construction and farm equipment.

In the winter, PM_{2.5} pollution is often a problem during inversions. In the summer, particulate matter pollution can increase as a result of wildfire smoke.

Exposure to fine particulate matter is associated with several serious health effects, including premature death. Adverse health effects have been associated with exposure to particulate matter over both short periods (such as a day) and longer periods (a year or more). Breathing fine particulate matter is bad for everyone, although it is most harmful to children, adults who are active outdoors, and people with lung and heart diseases.

The Clean Air Act (CAA) requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. In 1997, EPA adopted two standards for fine particulate matter: an annual standard of 15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and a daily standard of 65 $\mu\text{g}/\text{m}^3$. The CAA also requires EPA to review and revise as necessary each standard every 5 years. EPA revised the daily standard in 2006 and the annual standard in 2012 based on reviews of health studies showing adverse impacts at lower concentrations. The annual PM_{2.5} standard is currently 12 $\mu\text{g}/\text{m}^3$ and the daily standard is 35 $\mu\text{g}/\text{m}^3$.

When EPA revises a standard, the Idaho Department of Environmental Quality (DEQ) is required to designate areas exceeding the new standard as nonattainment. While the St. Maries area currently meets the *annual* PM_{2.5} standard, the area has recorded exceedances of the *daily* standard since 2015 and is in danger of being classified as a nonattainment area during future reviews of the daily standard.

3 St. Maries Area Description

St. Maries is Benewah County's largest city and county seat, ranking 60th in the state with a population of 2,472 people in 2021 US Census Bureau population estimates. St. Maries' history includes a strong tradition in the timber industry. The eastern side of Benewah County has depended on timber for most of its history while the western side also has roots in farming. The area's population has steadily increased in the last 5 years. The county's population was 8,990 people in 2016 and is 9,285 in 2020. The median family income in Benewah County is around \$47,556, with roughly 15.4% of the population below the poverty level (US Census Bureau, 2019).

Since hitting 15.2% in peak recession times, the county's unemployment rate decreased for nine consecutive years to 4.8% in 2019. The statewide unemployment rate for Idaho in 2020 is 5.6% (Idaho Department of Labor 2020). Government, particularly land management agencies, employs 39.7% of the county's workers. The trade, transportation, and utilities category followed by manufacturing are the next two largest economic sectors in the county and account for another 34.5% of the labor force (Idaho Department of Labor 2020).

The St. Maries airshed covers a large mountain valley at the confluence of the St. Joe River and St. Maries River drainages in Benewah County. The majority of the airshed is in Benewah and

Shoshone Counties and includes part of the Coeur d'Alene Tribe's reservation. The population center of the airshed is the city of St. Maries. An airshed is an area covered by a volume of air that has similar characteristics and is separated from other volumes of air by weather patterns or topography. Air pollution that is emitted in one area will spread out and become distributed across the airshed. For this reason, air pollution levels are generally similar across a given airshed. The boundaries of an airshed can be difficult to determine due to changing conditions. Ridges and mountains prevent air circulation and hold pollution within their boundaries, but weather conditions change on a daily basis. Features that obstruct air movement on some days may present no barrier at all when a weather front pushes through.

The St. Maries airshed was outlined based on local watersheds, representing the land area from which water drains toward a common water body in a natural basin. DEQ used watershed units as a starting point and reviewed factors such as terrain, meteorology, and location and distribution of emissions sources that may contribute to particulate matter air quality problems, including wildfires and prescribed burning.

The St. Maries airshed includes the communities of St. Maries, Santa, Fernwood, Emida, Calder, Clarkia, and Avery (Figure 1). The eastern boundary of the airshed reaches into the Coeur d'Alene Tribe's reservation and encompasses the southern end of Lake Coeur d'Alene. East of St. Maries the airshed is made up mostly of a mixture of forested mountains and developed river bottom. St. Maries sits at the confluence of the southwest-flowing St. Joe River and the northwesterly trending St. Maries River. Surface wind patterns are dominated by drainage flows in these directions.

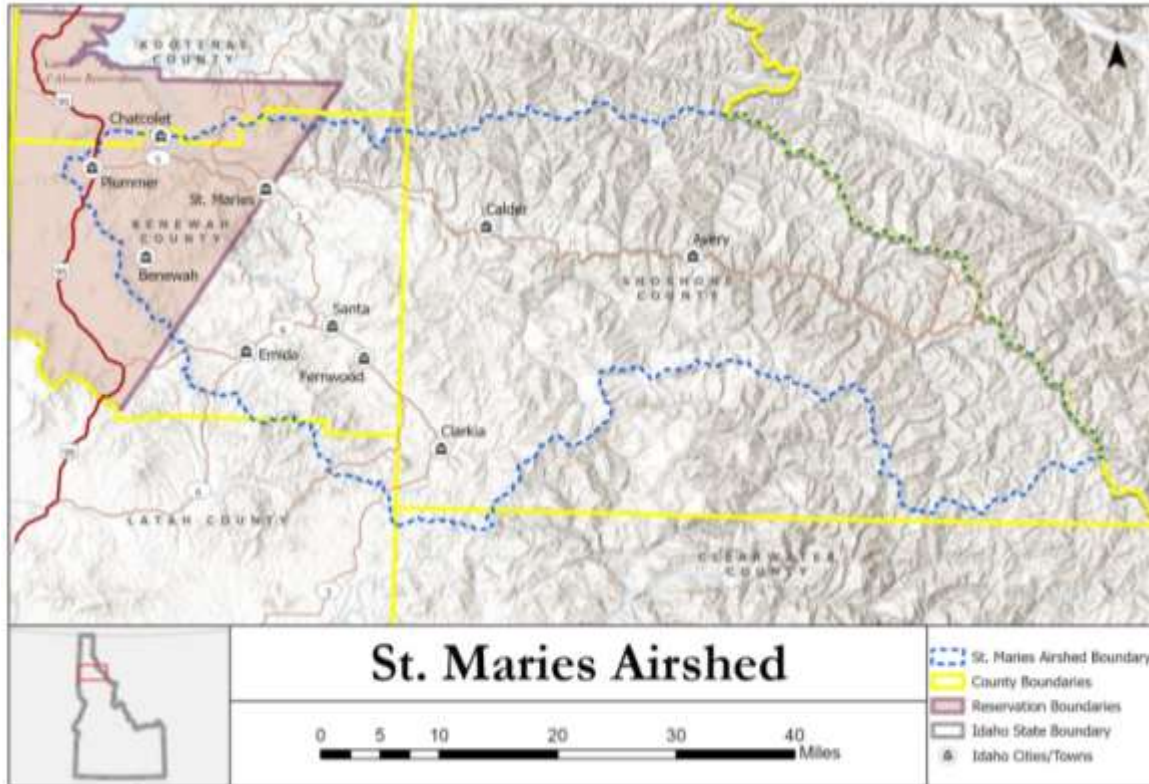


Figure 1. St. Maries airshed.

4 Air Quality

DEQ has been monitoring air quality in the St. Maries area since 2000. DEQ operates a regulatory monitor used to assess compliance with standards and a continuous monitor that is used to support air quality forecasting and smoke management programs. The monitors are in St. Maries on Center Avenue.

The current NAAQS for $PM_{2.5}$ are two-fold:

- Annual standard of $12 \mu\text{g}/\text{m}^3$: based on 3-year, annual average concentration
- Daily standard of $35 \mu\text{g}/\text{m}^3$: based on 3-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations

Design values are calculated for comparison with both the annual and daily NAAQS to assess compliance. Design values are based on data collected over long periods to ensure that typical pollutant concentrations are represented, rather than isolated spikes. Each year, the annual average and daily average values are calculated and these become the airshed's design values. These design values are used to determine if an area exceeds the standards.

- The design value for the annual $PM_{2.5}$ standard is the average of the annual means from 3 consecutive years.
- The design value for the daily $PM_{2.5}$ standard is the average of the 98th percentile 24-hour average concentration over 3 consecutive years. The 98th percentile value is the

observed concentration below which 98% of observations fall. Only 2% of observed concentrations are higher than this value.

Exceptional events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable (e.g., wildfire smoke or dust storms). The CAA allows DEQ to flag such data and exclude them from the dataset if EPA concurs. This process provides regulatory relief for states and local communities that exceed the NAAQS because of certain sources of pollution, including wildfires and some prescribed fires.

When DEQ identifies PM_{2.5} concentrations that have been influenced by an exceptional event, DEQ flags that data before submitting it to EPA. DEQ only requests the exclusion of flagged data when they have the potential to cause a violation of the NAAQS. Therefore, the final PM_{2.5} design value concentrations may change depending on how many exceptional events are approved by EPA.

Figure 2 and Figure 3 summarize the annual and daily design value concentrations in St. Maries for each year that monitoring data are available. The blue bars include all monitoring data while the green bars exclude data flagged by DEQ as exceptional.

Since 2007 the St. Maries airshed has met the annual PM_{2.5} standard after exceptional events have been excluded (Figure 2). The annual NAAQS was last revised in 2012 when EPA lowered the standard from 15 µg/m³ to 12 µg/m³. However since 2014 the St. Maries daily design value concentrations have been near or above the standard even when wildfire influences are removed (Figure 3). The daily NAAQS was last revised in 2006 when EPA lowered the standard from 65 µg/m³ to 35 µg/m³. The St. Maries airshed is at risk of a nonattainment designation for the daily PM_{2.5} standard if air quality continues to deteriorate.

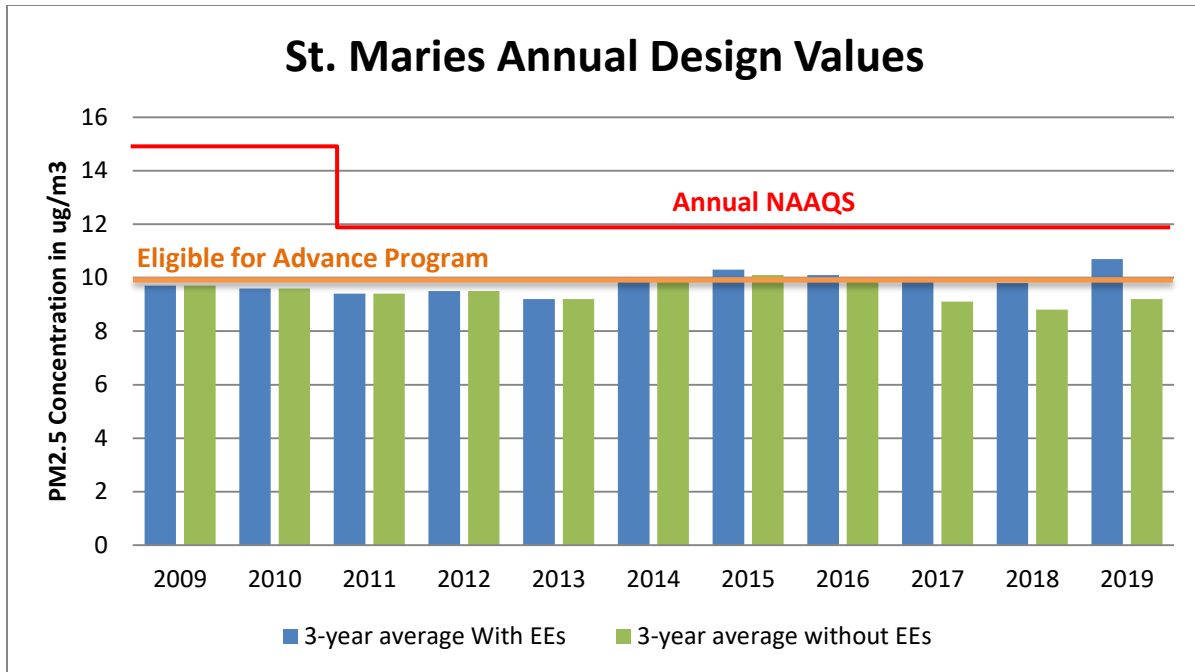


Figure 2. Annual PM_{2.5} design value concentrations at the St. Maries monitor, 2009–2019. Note: EE is exceptional event.

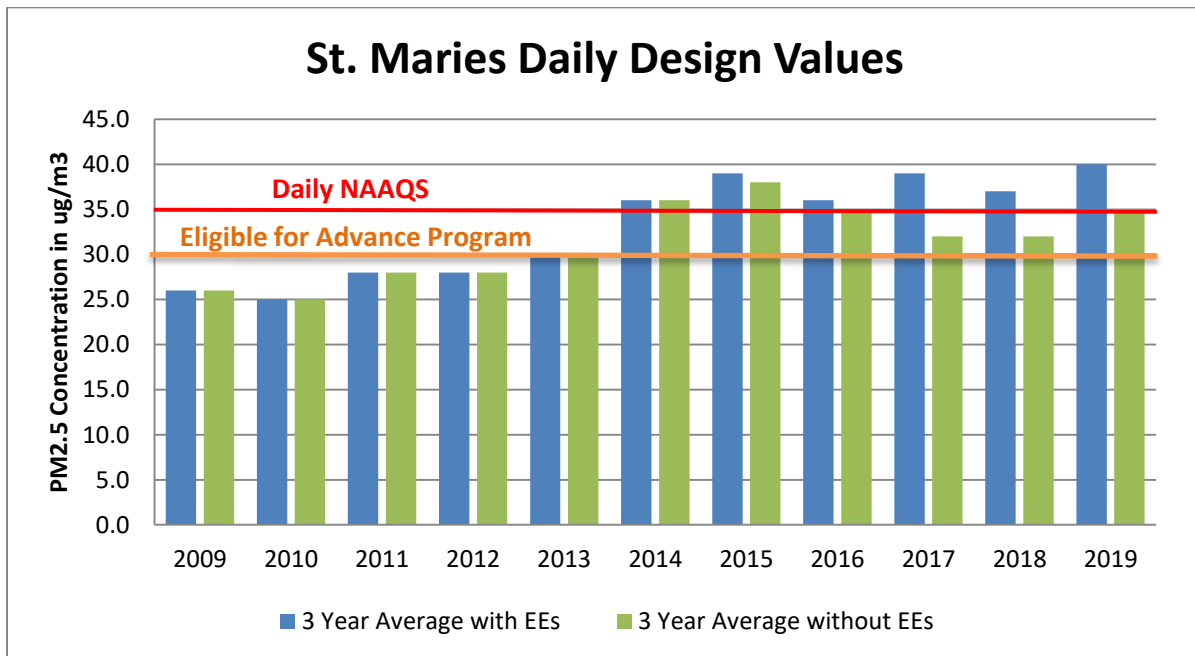


Figure 3. Daily PM_{2.5} design value concentrations at the St. Maries monitor, 2009–2019. Note: EE is exceptional event.

Figure 4 shows the daily PM_{2.5} values in the airshed over the course of a year using data compiled from a 4-year period. This dataset (Figure 4; Table 1) includes flagged data where wildfire smoke influence is suspected but excludes the days impacted by exceptional events as concurred with by EPA. As is the case with many mountain valleys in Idaho, the highest PM_{2.5}

concentrations occur in the winter months. For the 2016–2019 period, PM_{2.5} concentrations are overall more elevated in the first and fourth quarters (October through March) when compared to the summer months, except when concentrations spike in August and September due to wildfire smoke. These data clearly show that PM_{2.5} issues are a wintertime problem in the area.

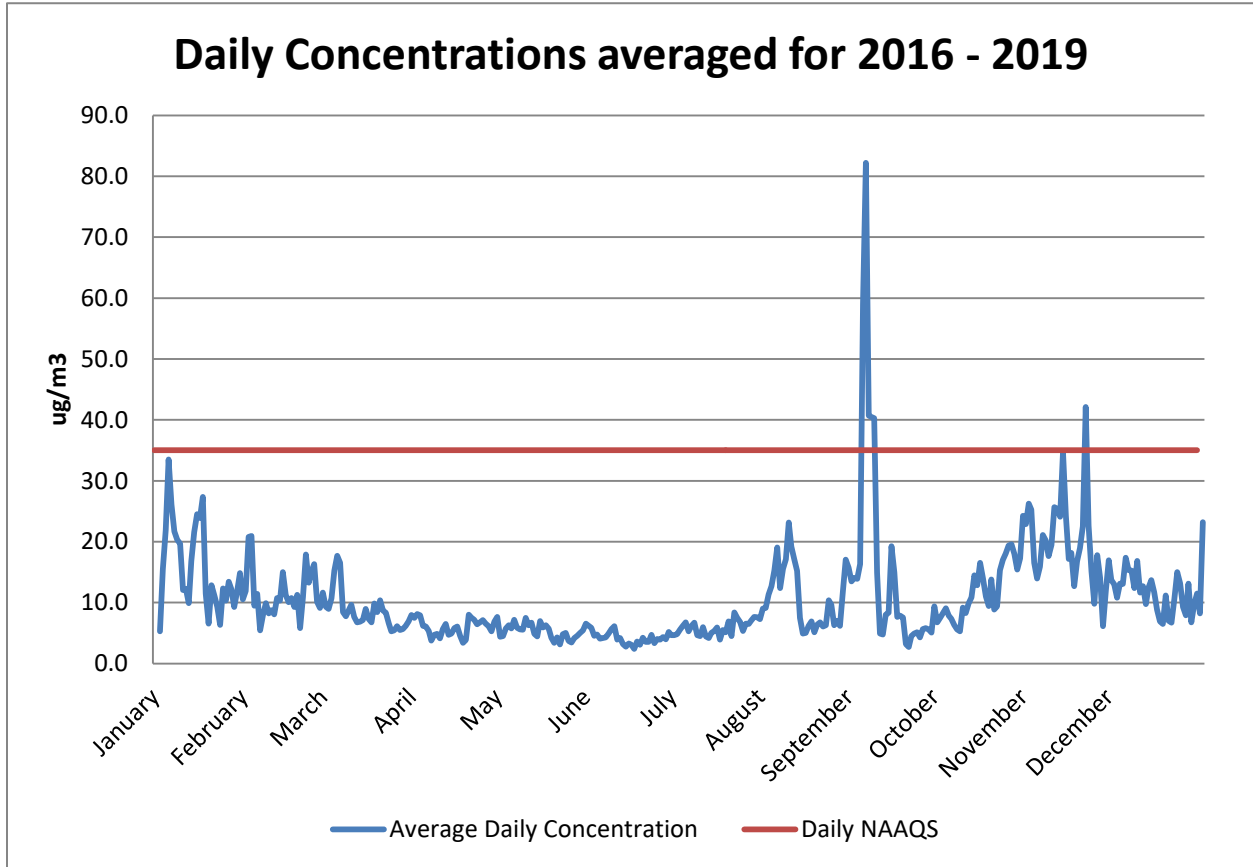


Figure 4. Average daily PM_{2.5} concentrations at the St. Maries monitor, 2016–2019, are highest in the winter.

The St. Maries airshed experiences the highest PM_{2.5} concentrations in the winter months. Over the last 4 years, 60% of all exceedances (values above the daily standard) occur in the first and fourth quarters, coinciding with the residential wood-heating season when temperatures are low and people rely on fireplaces and woodstoves for heating (Table 1).

Table 1. Seasonal distribution of PM_{2.5} daily standard exceedances in the St. Maries airshed (2016–2019).

Quarter	Number of Exceedances of Daily Standard
1 (Jan–Mar)	14
2 (Apr–Jun)	0
3 (Jul–Sept)	15 (9 from 1 smoke event)
4 (Oct–Dec)	<u>9</u>
Total	38

5 Pollutant Sources

5.1 Emission Inventory Development

EPA has regulatory and voluntary programs to reduce air pollutants emitted from a wide range of emission sources. To keep track of these emissions, EPA maintains the National Emissions Inventory (NEI), the national database of air pollutant emissions information. The NEI is a comprehensive and detailed estimate of annual total air emissions from all air emissions sources. These sources fall into four main categories:

- Point sources are located at a fixed location (i.e., large industrial facilities and electric power plants, airports, and smaller industrial, nonindustrial, and commercial facilities).
- Nonpoint sources are individually too small in magnitude to report as point sources (e.g., residential heating, commercial combustion, asphalt paving, construction and mining activities, agricultural activities).
- On-road vehicles and off-road mobile sources (i.e., nonroad—not typically used on roads and highways for transportation purposes) use gasoline, diesel, and other fuels. On-road sources include light-duty and heavy-duty vehicle emissions from operation on roads, highway ramps, and during idling. The off-road sources include recreational vehicles, construction equipment, lawn and garden equipment, aircraft ground support equipment, and locomotives.
- Event sources include wildfires, prescribed burns, and high wind events/dust storms.

The NEI is released every 3 years based primarily on data provided by state, local, and tribal air agencies for sources in their jurisdictions. According to the Air Emissions Reporting Requirements (40 CFR 51, subpart A), DEQ compiled a calendar-year 2017 statewide, county-level periodic emissions inventory (PEI). EPA takes state submittals and supplements categories and emissions not calculated by the state to develop the NEI.

The most recent emissions data were published by EPA as 2017 NEI (<https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data>). These data were the starting point for developing this 2017 base-year emissions inventory for the St. Maries airshed. Since St. Maries experiences elevated PM_{2.5} concentrations during the winter, this emission inventory summarizes emissions for a typical winter day. Some of the source categories were adjusted or considered insignificant based on local knowledge. Certain sources—such as

windblown dust, unpaved road dust, emissions from the agricultural sector (livestock, fertilizer application, and crop residue burning), and wildfires and most prescribed fires—do not contribute to airshed emissions during the winter months due to high relative humidity and high surface moisture conditions or because they do not take place during the winter.

To apportion the existing county emissions data to the St. Maries airshed specifically, DEQ examined 2017 NEI data for the following:

- Demographics (population or occupied household number ratio between the St. Maries airshed and Lemhi County)
- Land use
- Fraction of employees in various types of industry
- Fraction of the road network within the airshed
- Fraction of available acreage for specific activities
- Regional surveys when available
- Local knowledge of the different emissions sectors

To evaluate particulate matter emitted in the airshed, two large point sources in the airshed, PotlatchDeltic and Stimson Lumber, were offered more current methods to estimate emissions numbers that are more accurate than those submitted for the 2017 NEI. These updated estimates were allowed for the following reasons: (1) the numbers submitted in 2017 assumed that PM_{10} equaled $PM_{2.5}$, which is a gross overestimation for $PM_{2.5}$; (2) updated source tests at the facilities give more accurate emissions factors to use when calculating emissions for their boilers; and (3) the facilities now have updated the conversion factors they use when estimating emissions for some of their processes. These improvements give a more accurate picture of emissions from the facilities than those originally submitted.

Two major point sources of emissions in the airshed are the two lumber facilities (30.5% and 16.9%), and the two largest area sources are residential wood combustion (19.4%) and paved roads (17.0%). Residential wood combustion is burning wood to heat residential housing (using woodstoves, pellet stoves, fireplaces, and fireplace inserts) and for outdoor warming fires. The best approach to calculating emissions for residential wood burning is using wood-use surveys to determine how many homes burn wood for heat and how much wood is burned. Wood consumption is then multiplied by the emissions factors to calculate emissions. Without airshed-specific information on wood use, DEQ used regional default settings to estimate wood-burning appliance emissions. Of these woodstoves, many are older, non-EPA-certified stoves that emit more fine particulates. Older woodstoves are less efficient and burn more wood than newer stoves, contributing to increased particulate pollution.

Similar to residential wood burning, paved roads' contribution to $PM_{2.5}$ emissions were calculated using a regional emissions factor for paved roads multiplied by the miles of road in the area. The paved road particulate matter comes from dust and silt on the road, wear from tires and from sand or rock applied for traction in the winter. St. Maries and Benewah County generally apply quarter-minus rock to the roads as antiskid material. Road traffic breaks down this rock into smaller particles.

Table 2 summarizes the PM_{2.5} contributions from events, point, nonpoint, nonroad, and on-road sources in the St. Maries airshed. Overall the largest contributors are residential wood combustion and the two lumber facilities. Residential wood combustion is the largest nonpoint contributor of fine particulates in the winter, followed by emissions from industrial fuel combustion and nonroad equipment/vehicle emissions (Figure 5).

Table 2. St. Maries airshed emissions summary in pounds per winter day.

Emissions Categories	PM_{2.5} Emission (lb/day)	Description
Point Sources		
PotlatchDeltic Land & Lumber LLC - St. Maries	206.56	Lumber facility
Stimson Lumber Company - Plummer	372.47	Lumber facility
Nonpoint Sources		
Residential wood combustion	237.36	Residential woodstoves, pellet stoves, fireplaces, and fireplace inserts.
Industrial, residential and commercial combustion	110.75	Fuel combustion emissions for coal, distillate oil, natural gas, liquefied petroleum gas, wood, and kerosene at residential, small industrial, and commercial-institutional facilities for heating and other appliance operation. No residential wood.
Open burning	18.69	Household municipal solid waste in burn barrels and open burning of yard waste (leaf, brush, land-clearing debris)
Commercial cooking and charcoal grilling	12.50	Commercial food preparation from restaurant level data (deep fat frying, charbroiling)
Residential outdoor recreational combustion	9.82	Fire pits and any other type of outdoor wood burning appliances
Locomotives	2.00	
Vehicle and structure fires	0.59	
Livestock	0.17	
Nonroad Sources		
Nonroad combined	76.24	Mainly recreational equipment like snowmobiles, all-terrain vehicles, motorcycles. Includes logging and other equipment.
On-road Sources		
Paved roads	208.00	Dust particulates or silt on the roadway surface available for entrainment; increases with wintertime sanding
On-road	52.00	Tail pipe emissions from various categories of vehicles driven on roads; vehicle tires and brakes

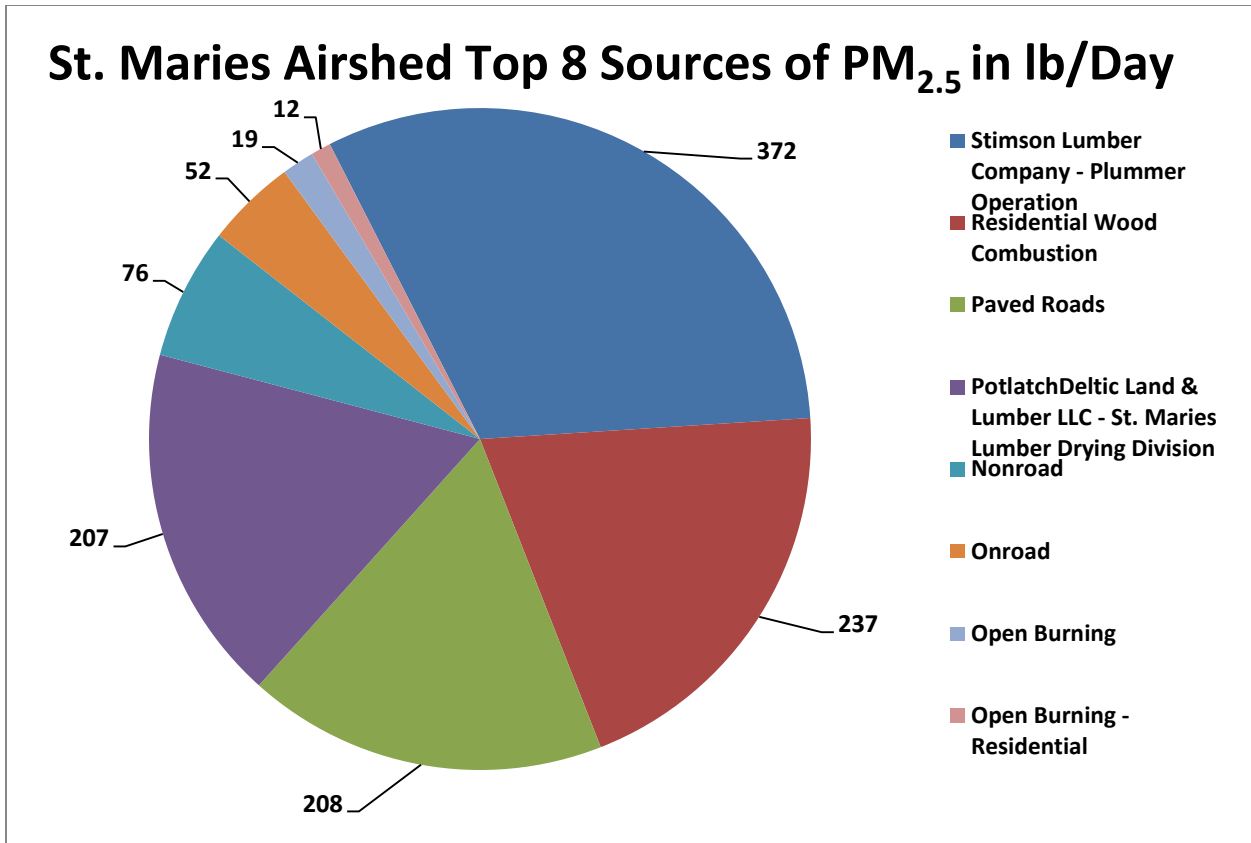


Figure 5. Top contributors of PM_{2.5} in the St. Maries airshed—winter emissions inventory.

5.2 Speciation and Source Apportionment

The emissions inventory provides a good idea of the air pollution sources present in the area that may be impacting air quality. However, not all of these sources may be contributing to the PM_{2.5} concentrations on days when air quality is at its worst. The actual monitoring data gives a better idea of which sources are the most impactful.

PM_{2.5} monitors use a filter to collect a 24-hour sample of the particulate matter in the air. These filters are then kept in long-term cold storage. DEQ selected 90 of these samples from 2016 to 2018 for further analysis. The samples were chosen from January to March and October to December to focus on the cool season when air quality is often the worst in St. Maries. The samples were sent to the Desert Research Institute (DRI) at the University of Nevada in Reno, which specializes in chemical analysis, or speciation, of PM_{2.5} samples.

DRI analyzed the samples for numerous chemical species such as carbon, potassium, sulfate, nitrate, and ammonium. The chemical analyses cannot measure some species so calculations were performed using EPA-recommended methods to estimate these components and complete the speciation of PM_{2.5} at the St. Maries site. These data provide a full chemical breakdown of the air pollution impacting St. Maries on the days with the worst air quality.

Tracing the data back to actual sources of air pollution requires using a specialized model called Positive Matrix Factorization (PMF). Developed by EPA, PMF is a mathematical receptor model used to identify contributing factors that represent sources or source types of pollutants. Figure 6 presents the results of the PMF analyses, showing modeled contributions of the sources to the PM_{2.5} concentration in St. Maries. In Figure 6, residential wood combustion and other biomass burning accounts for about 51% of PM_{2.5} concentration. Prescribed burning and other biomass burning mixed with dust accounts for about 28%, and the remaining 21% of PM_{2.5} was apportioned to secondary aerosols.

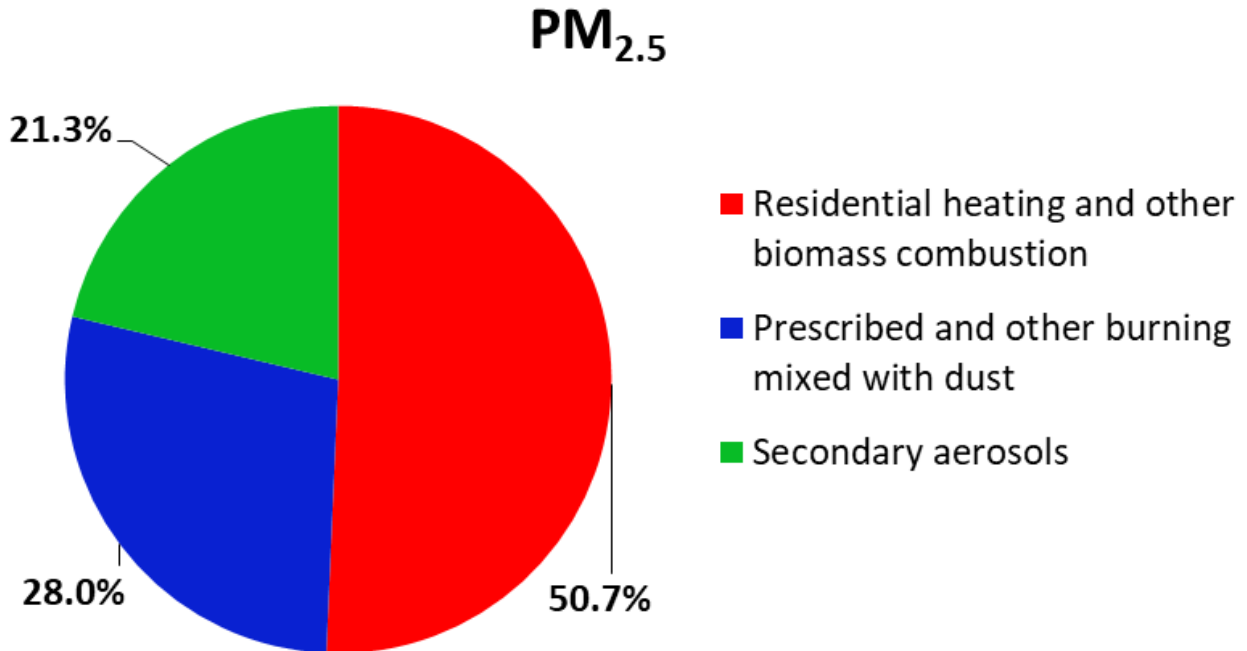


Figure 6. Modeled contributions of different PM_{2.5} sources (%).

The PMF results agree with the emissions inventory that the dominant source of PM_{2.5} in St. Maries is biomass burning. Biomass burning sources include a number of types such as residential wood combustion, prescribed fires, open burning, residential outdoor recreational burning, and biomass burning of the boilers of the PotlatchDeltic and Stimson lumber factories. Since the biomass burning sources have very similar chemical profiles, it is impossible to determine the individual contributions of each of these using this dataset.

Nevertheless, the PMF analyses were still able to distinguish to general groups of burning based on their seasonal profiles. The prescribed burning and other outdoor burning portion generally occurs in the fall while the residential heating and other burning portion occurs during the winter. The biomass burning of the boilers of the PotlatchDeltic and Stimson lumber factories may also share a similar seasonal pattern of the first factor with highest levels in cold winter. This seasonal pattern is due to (1) more biomass is burned in very cold days in winter than in warmer months so the boilers can supply the same volume of steam; and (2) the lower boundary layer and stronger temperature inversions in cold winter lead to elevated PM_{2.5} concentrations even with the same amount of emissions.

The remaining source group identified by the PMF analysis is secondary aerosols. Secondary aerosols cover PM_{2.5} that is not directly emitted by any source but is created in the atmosphere through different chemical reactions. Many different sources can contribute to creating these aerosols, and it is not possible to identify the exact sources through this process. Possible contributors include biomass burning, vehicles exhaust, and industrial emissions.

6 Community Partners

On January 10, 2020, the City of St. Maries in partnership with DEQ signed up to participate in the PM Advance Program and take voluntary actions to improve air quality in the St. Maries airshed (Appendix A). Since then, extensive outreach efforts in the community have increased awareness of PM_{2.5} pollution and its impacts on public health. DEQ worked closely with the city to promote community participation in selecting successful strategies to reduce particulate pollution and protect public health.

An airshed advisory group was established in 2018 to give local leaders and stakeholders a forum to build consensus around actions to improve PM_{2.5}-related air quality issues. The St. Maries Clean Air Committee (SMAAC) includes concerned city and county residents, local state land managers, public health officials from the community hospital, local conservation groups, and civic leaders.

Through months of deliberation, the SMAAC assessed numerous strategies to reduce PM_{2.5} pollution and selected a combination of strategies with the most community support. They focused on residential wood combustion impacts and outreach and education tools to keep the local community informed and empowered to take specific actions on days with high particulate concentrations.

7 Emission Reduction Strategies

The goal of this path forward is to improve year-round air quality in St. Maries by engaging the community to ensure ongoing success. “Strategies for Reducing Residential Wood Smoke” (EPA 2013) recommends that an effective program addressing air quality issues related to residential wood combustion should include several strategies.

- Education and outreach—Areas should start by implementing an education and outreach campaign to raise awareness of the air quality issue and let citizens know how they can help improve air quality.
- Voluntary measures—Involves a replacement or retrofit program for wood-burning appliances. Change-out programs replace old stoves with new, cleaner-burning appliances.
- Curtailment program—A wood smoke curtailment program, either voluntary or mandatory, can be followed by additional regulations for other types of burning that may affect air quality within the airshed.

The emission reduction strategies identified by the SMAAC include elements in each of the three areas mentioned above. The strategies focus primarily on public outreach and education about the relationships between wood smoke, air quality, and public health. Education is necessary for the other strategies to be effective. Measures that are currently being implemented and developed for future implementation are described below.

7.1 Outreach and Education

Educating the community and building awareness about air quality issues is the main focus of this plan. Education on the key issues related to PM_{2.5} in the area will ease the way for future voluntary and possible future regulatory efforts by developing an understanding of the problem, its sources, and how it can be addressed. DEQ developed a strategic communication plan based on a detailed situational analysis of the particulate matter concerns in St. Maries (Appendix B). This plan will guide all future outreach and education efforts. The SMAAC, with assistance from the City of St. Maries and DEQ, is already implementing several of the measures described in the communication plan. Other measures will be phased in during the first 5 years of the PM Advance Program. Existing measures will be maintained or expanded over the course of the program's commitment to PM Advance, as described below.

7.1.1 Public Education

Wood-burning appliances that are operated properly and use well-seasoned wood produce less particulate matter pollution. Education about how to burn cleanly will help all residents who use woodstoves to heat their home, regardless if they have an EPA-certified stove. The SMAAC currently uses printed and online materials from DEQ and the EPA Burn Wise program. Going forward, the SMAAC will modify the content to address the St. Maries area specifically, expand distribution of these materials, and target homeowners who use woodstoves.

The following public education efforts are already in progress or being evaluated:

- The SMAAC is partnering with several local stakeholders to increase distribution of materials:
 - US Forest Service and Idaho Department of Lands to distribute Burn Wise materials and moisture meters with wood-harvesting permits
 - The program will reach out to local stove retailers, City of St. Maries, local health clinics, school administrators, and the St. Maries Public Library to distribute general informational materials
 - The program is considering mailing Burn Wise materials with local water bills during the winter.
- DEQ has purchased carbon monoxide monitors and wood moisture meters and made them available to the public through the St. Maries Fire Department and Idaho Department of Lands office, respectively.

DEQ will make existing resources available to interested schools in the community to assist teachers with environmental education related to air quality. DEQ currently has a number of

curricula available for use in classrooms ranging from short demonstrations to semester long research projects. The St. Maries School District is running the EPA Air Quality Index (AQI) flag program at Heyburn Elementary School and may expand to the St. Maries junior and senior high schools.

No tracking of past outreach efforts exists to inform decisions on the effectiveness of these strategies. Informal feedback over many years has shaped the current direction of outreach. Moving forward, the program will put more effort into measuring the success of outreach activities. This feedback may include recurring community awareness surveys or other options determined by the program.

7.1.2 Media and Social Media Engagement

DEQ and the SMAAC will use a variety of forms of media—local radio announcements and interviews, Idaho Public Television, local and regional newspapers, and social media—to reach a wide audience and determine the most effective communication channels.

Many of these outreach efforts will recur every year at the onset of the heating season to remind the community of good burning practices and keep air quality at the forefront of pressing community issues.

7.1.3 Technology

The SMAAC will promote the use of technology such as electronic signs, smart phone applications, and the DEQ website and social media to communicate accurate near real-time air quality information to the community.

DEQ and the City of St. Maries hope to partner with Banner Bank in St. Maries to include air quality information on their current electronic sign. The sign is located on the main street of St. Maries and is readily visible to citizens and visitors.

Including air quality information on the sign will provide accurate updates through active real-time feeds of current PM_{2.5} levels, associated health messages, and air quality advisories. In a community with limited real-time communication options and media markets, a sign is an effective way to alert the community to changing air quality conditions and burn bans. This effort will increase program reach and improve the timeliness of important data.

DEQ is developing a mobile application that provides current and forecasted air quality, information on burn bans, and health messages. The application will allow users, such as a coach or parent concerned about elevated concentrations during sports practice, to access up-to-date information while on the run. It may also benefit mobile phone users who do not have access to a computer or dependable internet connection. The application will include notifications or alerts that can be set up by the user to signal when air quality reaches a user-defined level.

7.2 Voluntary Measures

Voluntary measures are not based in regulations but instead encourage specific actions or behavior that may be beneficial to reducing PM_{2.5} concentrations.

7.2.1 Targeted Woodstove Change-Out

Most of the homes within the St. Maries airshed have a woodstove. It is estimated that over half of these woodstoves are not EPA certified. As these uncertified stoves are replaced with cleaner EPA-certified stoves, emissions will decrease. Old woodstoves are replaced as they break down or a house is sold. However, to see an improvement in air quality, this turnover to new stoves needs to happen at a quicker rate. There are two voluntary programs related to woodstoves that can benefit St. Maries area residents. One is a state tax deduction and the other is a woodstove change-out program.

Idaho offers a tax deduction for residents who replace woodstoves not meeting current EPA standards with a newer EPA-certified stove, pellet stove, or natural gas or propane appliance. Forty percent of the total cost—purchase price plus professional installation—may be deducted in the year the woodstove or insert is replaced. During the next 3 years, 20% of the total cost may be deducted each year. The total annual deduction is limited to \$5,000. This program encourages the replacement of old, dirty stoves with much cleaner heating appliances.

DEQ is currently running a woodstove change-out program for the St. Maries area at the request of the SMAAC. The group has secured \$71,000 for this program with \$20,000 coming from PotlatchDeltic Inc, \$31,000 from the Coeur d'Alene Tribe, and \$20,000 from a Supplemental Environmental Project (SEP) overseen by DEQ. Under the program, low income households within the city of St. Maries can apply for up to \$4,000 to purchase and have professionally installed a new heating appliance to replace any uncertified woodstove or certified woodstoves that are more than 20 years old. With current funding, the SMAAC hopes to replace 15–18 stoves this year. The group is also seeking funding to continue and broaden the program beyond this year.



Figure 6. St. Maries woodstove change-out boundary, 2020.

7.2.2 Voluntary Open Burning Curtailment

The SMAAC identified voluntary open burning limitations as an effective means of reducing elevated levels of PM_{2.5} pollution during periods of poor air quality. During air stagnation events with strong temperature inversions, continued open burning contributes to already poor air quality conditions. The geography around St. Maries enhances any temperature inversions that develop due to the compounding effects of differential heating along the mountain sidewalls (Whiteman 2000). During the winter, the lower sun, coupled with this geography, create a feedback loop that can strengthen inversions (Stull 1988).

Starting with the 2021–2022 heating season, DEQ hopes to assist the community in implementing a voluntary open burning curtailment program. This program will have two levels based on forecasted air quality:

- Level 1—AQI forecasted to reach between 80 and 100. Voluntary curtailment and communication focused on homeowners within the St. Maries airshed.
- Level 2—AQI forecasted to reach 101 or higher. DEQ will issue a Stage 1 advisory (called a forecast and caution as defined in IDAPA 58.01.01.556) prohibiting all open burning in the airshed.

To communicate a voluntary curtailment event, DEQ will issue statements and pertinent information through the electronic sign, official DEQ social media outlets and website, EPA AIRNow, and an extensive email distribution list that includes broadcast and print media, law

enforcement, public health agencies, schools, other government agencies, and other interested parties.

7.2.3 Voluntary Road Dust Reduction

St. Maries currently operates street sweepers to collect road dust when city roads dry out after snowy periods and water trucks to wash excess rock material used as an antiskid device off the roadways. The city would like to pursue funding opportunities such as grants for equipment to apply liquid deicers to decrease the amount of antiskid material applied during snowstorms. St. Maries is also interested in upgrading their street sweeping equipment if funds are available.

7.3 Current Regulatory Measures

Several regulatory measures that address PM_{2.5} emissions are currently enforced by DEQ. These regulations target open burning, which includes prescribed burning and residential burning, and fugitive dust. While these regulations have been in effect and enforced by DEQ for many years, the agency is expanding the education and outreach surrounding them to raise awareness and increase compliance. Informational brochures and fact sheets about allowable burning practices and prohibited items will be made available at city and county offices and provided with each firewood permit issued at Idaho Department of Lands and US Forest Service offices located within the airshed.

7.3.1 Air Pollution Emergency Rule

The “Air Pollution Emergency Rule” (IDAPA 58.01.01.550–562) authorizes DEQ to manage and address pollution levels that may constitute a health emergency. The rule defines four stages or levels of an emergency, from an Air Pollution Forecast and Caution (Stage 1) through an Air Pollution Emergency (Stage 4), with each stage addressing a progressively more serious air quality event. Stage 1 is triggered when air quality has reached or is forecasted to reach an AQI of 101. During a Stage 1, all open burning is prohibited.

When issuing a Stage 1 Air Pollution Forecast and Caution, DEQ will notify the public through broadcast media, social media, electronic mail lists, and public signage. In the notification, DEQ will provide information on the time frame of the emergency, time of next update, area affected, open burning restrictions, health impacts and recommended actions, contacts for more information, and an AQI graphic.

7.3.2 Rules for Control of Open Burning

DEQ regulates all forms of open burning (IDAPA 58.01.01.600–624). The open burning rules aim to reduce emissions and minimize the impact of open burning to protect human health and the environment. Informational brochures and fact sheets about allowable burning practices and prohibited items will be made available at city and county offices and provided with each firewood permit issued at Idaho Department of Lands and US Forest Service offices in the airshed. DEQ will educate local fire dispatch centers and key personnel to communicate to

individuals seeking permission to burn what is illegal and what is allowable or to have them contact DEQ with any concerns.

These rules prohibit burning certain materials and allow the open burning of others within specific guidelines.

Individuals living outside city limits anywhere in Idaho must obtain a fire safety burning permit from the Idaho Department of Lands during the closed fire season (May 10–October 20). It may also be necessary to obtain a permit from the local fire department or district before burning. DEQ recommends that burners notify their local fire department or district of their burn to prevent unnecessary dispatch of firefighting resources.

7.3.3 Rules for Control of Fugitive Dust

DEQ regulates fugitive dust emissions (IDAPA 58.01.01.650–651). The fugitive dust rules focus on reducing airborne particulates and minimizing the impact of blowing dust to protect human health and the environment.

Periodically under clear, dry weather conditions following a snow event where sand was applied to public roadways such as State Highways 5 and 3 that travel through the center of St. Maries, significant quantities of dust have been observed becoming suspended by traffic. At locations where materials such as dirt and dust are likely to become airborne, reasonable steps to control the blowing material must be taken. When deciding to control fugitive or blowing dust, consider the impacts to homes, businesses, schools, and other community areas. Efforts to control blowing dust can include using water or chemicals, such as magnesium chloride where practical, or using equipment such as street sweepers.

7.3.4 City of St. Maries Ordinance

Since 1960s, the City of St. Maries has had a local ordinance that bans residents from burning residential solid waste of any kind within the downtown core of the city (Ord. 375) and requires a permit to open burn everywhere else inside of city limits. The city updated this ordinance to fit the current local government structure and published the new version on June 26, 2019. The SMAAC will work with local media outlets and social media to inform the public of the existing ordinance through news releases and community announcements.

7.4 Possible Future Regulatory Measure

In many communities affected by seasonal woodstove smoke, local governments have taken steps to develop rules or ordinances aimed at encouraging real estate buyers and sellers to remove old, inefficient, uncertified woodstoves from properties and replace them with new certified woodstoves or other alternative heating technology before sale. The SMAAC believes such an ordinance would benefit the community. The group will continue to work with the city, county, and DEQ to propose and evaluate conditions for local ordinances to effectively address the need to remove uncertified woodstoves.

The air quality ordinance would also set out requirements for proper operation of solid fuel-burning devices including limitations on the materials that may be used as fuel.

7.5 Implementation Schedule

A number of the strategies identified in this plan were initially implemented before participation in the PM Advance Program. For nearly two decades, DEQ has issued public announcements through print, broadcast, and social media to inform the public of significant air quality issues impacting the community. In addition, the SMAAC and DEQ have made brochures and fact sheets available for distribution at Idaho Department of Lands and US Forest Service offices when firewood permits are issued. DEQ also purchased and distributed woodstove thermometers and made wood moisture meters available to the public.

DEQ expects during 2021, the SMAAC and DEQ will continue leading community outreach and education efforts, with increased engagement as the winter heating season approaches. DEQ also plans on leveraging communication opportunities during any wildfire events that typically impact the airshed during late summer into fall.

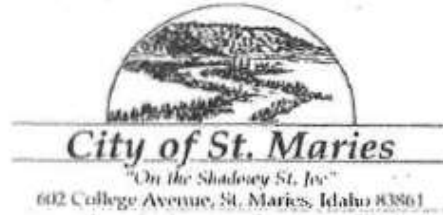
Beginning with the 2021–2022 heating season, DEQ will implement a voluntary woodstove curtailment program. DEQ will communicate the appropriate messages and actions through the channels identified in section 7.2.2 as degrading air quality conditions become prevalent within the affected area of the airshed.

Implementation of regulatory measures and monitoring activities within the St. Maries airshed will be ongoing throughout the term of the program.

References

- EPA (US Environmental Protection Agency). 2009. *Integrated Science Assessment (ISA) for Particulate Matter*. Washington, DC: EPA. EPA/600/R-08/139F.
- EPA (US Environmental Protection Agency). 2013. “Strategies for Reducing Residential Wood Smoke.” Research Triangle Park, NC: EPA. EPA-456/B-13-001.
www.epa.gov/sites/production/files/documents/strategies.pdf.
- Idaho Department of Labor. 2020. “Benewah County Workforce Trends.” Idaho Falls, ID: Idaho Department of Labor. www.labor.idaho.gov/publications/lmi/pubs/BenewahProfile.pdf.
- Stull, R.B. 1988. *An Introduction to Boundary Layer Meteorology*. Dordrecht, Netherlands: Kluwer Academic Publishers.
- US Census Bureau. 2019. Community Facts.
https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed 5/21/2020.
- Whiteman, C.D. 2000. *Mountain Meteorology: Fundamentals and Applications*. New York: Oxford University Press.

Appendix A. PM Advance Program Participation Letter



Phone 208-745-2177

Fax 245-6579

January 17, 2020

Laura Bunte, Senior Policy Advisor
PM Advance
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards, C304-01
Research Triangle Park, NC 27711

Dear Ms. Bunte:

The City of St Maries, Idaho in partnership with the Idaho Department of Environmental Quality would like to participate in the PM Advance program with respect to the St Maries area of Benewah County. We wish to join this partnership with EPA to preserve or improve the air quality in the St Maries area. We feel that we meet the program eligibility criteria because:

1. The St Maries area is not currently a nonattainment area for the 1997 and/or 2012 annual fine particulate matter (PM_{2.5}) National Ambient Air Quality Standards (NAAQS) and/or for the 2006 24-hour PM_{2.5} NAAQS,
2. The St Maries area consists of the City of St Maries and the surrounding impacted airshed within Benewah County, Idaho,
3. The following air monitor reflects the air quality in the St Maries area: St Maries-Forest Service Building (AQS ID 160050010), and
4. Idaho has met the National Emissions Inventory reporting requirements.

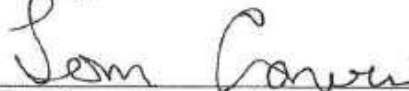
We understand that our efforts under PM Advance may benefit the St Maries area by potentially:

- Reducing air pollution in terms of PM_{2.5} as well as other air pollutants
- Continuing to ensure continued healthy PM_{2.5} levels
- Maintaining the PM_{2.5} NAAQS,
- Helping avoid violations of the PM_{2.5} NAAQS that could lead to a future nonattainment designation
- Increasing public awareness about PM_{2.5} as an air pollutant
- Targeting limited resources toward actions to address PM_{2.5} problems quickly

Our goal is to implement measures and programs to reduce PM_{2.5} in the St Maries area in the near term. We are also in agreement it is in our best interest to work together and in coordination with stakeholders and the public to proactively pursue this goal.

Thank you for consideration of allowing the St Maries area to participate in the PM advance program. Should you need further information or have questions regarding our request, please contact Pascale Warren at pascale.warren@deq.idaho.gov, (208) 373-0586 or Tom Carver at (208) 245-2577.

Sincerely,



Tom Carver, Mayor
City of St Maries



Tiffany Boyd
Air Quality Administrator
Idaho Department of Environmental Quality

cc: Jeff Hunt, Region 10 PM Advance, EPA

Appendix B. St. Maries PM Advance Strategic Communication Plan

Purpose

To better engage St. Maries residents on air quality issues and provide them with the tools to make better decisions about when, how, and what to burn to reduce particulate emissions from wood-burning stoves.

Existing Resources

The Idaho Department of Environmental Quality (DEQ) already forecasts air quality and notifies the public through websites, email alerts, and social media during stage 1 air quality events (forecasts and cautions). Coeur d’Alene Regional Office (CRO) staff follows established standard operating procedures to develop and issue a daily Air Quality Index (AQI) forecast for St. Maries that summarizes current and future air quality conditions and any actions the public should take to protect itself. However, public notification is weak, and it is currently unknown how widely DEQ’s message is disseminated so that residents can adjust burning practices accordingly. DEQ’s daily AQI forecast is available to people who visit either DEQ’s or AirNow’s website or subscribe to EPA’s EnviroFlash notification system. When DEQ’s Air Pollution Emergency Rule applies, CRO communicates the stage 1 forecast and caution to the National Weather Service and local fire departments, health districts, school administration, and media contacts and works with the DEQ Communications and Outreach group to include all appropriate social media platforms.

Action	Who is Responsible	Frequency of Action	Method of Action	Audience
AQI Forecast	CRO	Daily	DEQ website, AirNow	Public
Stage 1 Forecast and Caution	CRO	As needed, up to daily	Email alerts	Public outlet sources

Stakeholders and Partners

DEQ identified the following stakeholders, partners, and audiences whose support and involvement are instrumental in the success of the outreach campaign.

Stakeholder/Partner	Interests
City council	The council has an interest in improving air quality in St. Maries to avoid a nonattainment area designation and associated Clean Air Act requirements.
St. Maries Airshed Advisory Committee	This group was formed as part of the PM Advance Program and is currently exploring strategies to reduce PM emissions across the airshed. The committee serves as a bridge between DEQ, city council, and the community. This group has a strong desire to see air quality improved and advocate for pollution reduction strategies.
Woodstove users	The number of days woodstoves can be operated without degrading air quality may decrease if users are requested to take AQI into consideration prior to burning. Woodstove users may have to rely on more expensive alternate fuel sources to heat their homes.

Stakeholder/Partner	Interests
Public health district, healthcare professionals	The PM _{2.5} problems are a public health issue as the NAAQS exist primarily to protect public health. Public health officials are a trusted source of community health data (risks and impact of PM _{2.5} exposure) and a credible voice for the clean air message. They can also help broaden the clean air message to indoor air quality, which also becomes an issue with older/uncertified woodstoves.
Retailers; firewood sellers; Hearth, Patio and Barbeque Association; chimney sweepers	Residential wood combustion is one the main sources of PM _{2.5} in the St. Maries airshed. Retailers of wood-burning devices, industry trade associations associated with woodstoves, and firewood sellers could all promote using seasoned wood, existing stove/chimney maintenance, and correct stove operation as part of their business and creating savings for consumers.
Chamber of commerce; local business representatives in tourism, food service, energy, areas requiring air quality permits	A nonattainment designation has important ramifications in economic development while quality of life issues associated with smoke impacts on the airshed can affect tourism. Local businesses have a stake in protecting air quality to minimize the regulatory burden to their operations.
School administrators, youth group leaders	Educators interact daily with one of the most at-risk groups from PM _{2.5} pollution. They can have an impact in shaping curriculum or through informal education/community involvement projects.
The Gazette Record and KOFE Radio	These media outlets can help shape public opinion and spread information on air quality to the community.

Desired Outcomes

This outreach campaign aims to improve public understanding of particulate pollution and air stagnation events and how woodstoves play a role in increasing particulate pollution. Anecdotal evidence suggests that this lack of awareness is in part due to the worst conditions occurring at nights and being often unseen. Although not unanimously accepted, DEQ’s analysis of the air quality is simple but compelling. The majority of daily air quality standard exceedances occurs in the fall and winter and is associated with residential wood combustion during the heating season.

In addition to a long tradition of using wood in rural areas, people are extremely hesitant of moving away from solid fuel to heat their homes due to its relative affordability and reliability. Short of switching fuels, the adoption of better burning practices can make great strides in reducing pollution.

Themes, Key Messages, and Talking Points

1. Improper burning practices increase PM_{2.5} emissions that become trapped near the ground during wintertime inversions and degrade air quality.
 - a. Burn clean with seasoned, dry wood and build smaller, hotter fires to avoid smoldering.
 - b. Maintain existing stoves to improve efficiency and safety or consider upgrading to EPA-certified appliances.
2. Be strategic and check the AQI before burning.
 - c. Woodstoves are best used on days with good to moderate AQI that allows for pollutant dispersion.

- d. Whenever possible, consider switching to alternate source of heat to keep warm on days with high AQI.
3. Incomplete combustion of wood emits pollution that can contribute to short-term and long-term health effects, especially in sensitive populations.
 - e. Better burning reduces harmful emissions from wood.
 - f. Good dispersion (low AQI) prevents the buildup of pollution in the airshed.

Action Plan

Tactics

- Engage in direct contact with those directly affected
 - Speak with residents in the community.
 - Send mailers (from utilities/city council listserv).
 - Work with the school district. Communicate air quality alerts to students and their families and make them aware of action they can take.
- Inform wider city or regional audience
 - Develop media strategy and control measures to reach residents outside of St. Maries but who are still part of the airshed.

Communication Products

- Advertisements/notices—Air quality-related information run biweekly over the heating season in the Gazette Record
- Media advisories and press releases—Press release to TV, radio, and newspaper about AQI sign and how the St. Maries community can use the information to protect their health
- Fact sheet—St. Maries-specific fact sheet about woodstoves and wintertime air quality
- FAQs
- Graphics
- Backgrounder—How the woodstove campaign fits into the larger issue of ongoing air quality problems and what is being done to address problems
- Brochure, postcard, or poster—Mailers with utility bills about woodstove maintenance/and air quality
- Web Page—Frequent updates to the St. Maries PM Advance website to showcase everything being done in the airshed
- Op/ed, letter to the editor, etc—SMAAC or city council member announce start of the air quality campaign to reduce particulate matter emissions and improve air quality
- Public service announcements (radio)
- Social media—Frequent updates to showcase website content and all activities related to air quality in the airshed
- Support material—School district air quality procedures and air quality-related school activities (inversion in a cup, dusting the air, smoke detectives)

Communication Activities

- Public meetings
- Stakeholder briefing/meeting through monthly advisory committee meetings
- Open houses
- Interviews with reporter
- Conference calls
- Attendance at local events
- Advisory committee presentation to civic groups in the airshed

Staffing

- CRO staff will conduct the day-to-day outreach activities identified in this document, including leading and facilitating advisory committee meetings and interaction with the city council, media, and community.
- The state office will work with CRO to develop outreach materials and messaging and identify distribution channels/avenues of publications appropriate for outreach.

Action Matrix

Phase I actions were implemented during the 2020–2021 heating season. Actions from the Phase II section will be implemented during the 2021–2022 heating season.

Action	Who is Responsible	Date/Time Action is to Occur	Method of Action	Date Action Occurred
Phase I Implementation				
Forecasting	CRO	Daily by 4 p.m.	Follow appropriate SOP to develop daily forecast	Ongoing
Notification of forecasting	CRO	Daily	Enviroflash email, electronic sign, websites (DEQ, AirNow), social media, press release, radio, newspaper	Ongoing
Develop St. Maries-specific outreach brochure; information on woodstove maintenance, air stagnation events, and PM pollution; and materials for advisory committee members	CRO works with state office to develop content and materials	2021		
Media advisory in Gazette Record	CRO works with state office	2–3 times every heating season	Run air quality-related ads about woodstove heating	Ongoing
PSA on heating with woodstoves	CRO works with state office to develop content	During Stage 1 caution	Radio	
Background story in Recorder Herald	CRO works with state office	2021		
Phase II Implementation				
Op/ed letter to the editor	CRO working with state office and advisory committee	2021		
EPA AQI flag program	CRO	2021	Notify school of flag program and encourage participation	
Air quality-related school activities and outreach materials	CRO and school	Once during heating season	Work together to develop a plan to integrate educational materials into the classrooms.	
Update St. Maries PM Advance web page and social media	CRO works with state office	With each new action	Press release, tweet, or Facebook post	

Evaluation

Evaluating the Plan

- Reach out to all stakeholders identified and discuss their roles or their willingness to support the campaign or directly contribute to the campaign by helping to spread messaging or participating/organizing an activity above.
- Analyze news content of media and editorials and sharing on social media platform to determine if our messages are being used and how they are being received.
- Collect statements and sentiment expressed in local meetings and forums.

Reevaluating the Plan

- Use data from evaluation and feedback from advisory committee and city council to adjust the plan as needed.

Presenting the Plan

- CRO will present the final draft of the plan to the advisory committee and city council to gain support for the outreach/communication activities outlined in the plan.

Implementing the Plan

- Continue monthly meetings with state and regional offices to discuss progress and re-assess approaches.

Updating the Plan

- Update plan quarterly (twice during the heating season) and use updates to correct course if necessary based on monthly meetings assessments.