Implementing the PM2.5 Ambient Air Quality Standard in the State of Iowa

Report to the Governor and General Assembly

Iowa Department of Natural Resources
Patricia Boddy, Interim Director
[December 30, 2010, revised January 3, 2011 and January 24, 2011]

Table of Contents

1.0 Executive Summary 5
2.0 Background 12
Fine Particulate Matter (PM2.5) Levels, Health Impacts, and Sources. 12
Development of Recommendations. 14
State Implementation Plan Requirements 15
3.0 Implementation Recommendations 17
1. Recommendations for Communities that will reduce PM2.5 17
1.1: Adopt legislation to prohibit open burning of residential waste within the limits of municipalities. 17
1.2: Assure that PM2.5 ambient air levels are measured to facilitate protection of public health and continued timely community development. 21
1.3: Adopt reduced idling legislation. 22
1.4: Encourage reductions in PM2.5 emissions through a public education campaign on the proper use of fireplaces, wood stoves, and outdoor wood boilers.. 23
1.5: Seek public input on ideas for use of federal diesel emissions reduction act (DERA) funding. 25
1.6: Encourage individuals to reduce their air pollution footprint through the expanded use of social media. 26
2. Recommendations for Business and Industry that will reduce PM2.5 26
2.1: Beginning on January 1, 2012, implement a permitting program that will control emissions of direct PM2.5 and prevent ambient concentrations from exceeding the PM2.5 National Ambient Air Quality Standards. 26
2.2: Steps to ease the regulatory burden of PM2.5 implementation. 32
3. Recommendations for the Agricultural sector that will reduce PM2.5 36
3.1: Expand the educational & outreach efforts to the agricultural community on best practices to reduce ammonia emissions from livestock operations and excess nitrogen application. 36
3.2: Fund the Iowa State University Extension to update the publication "Practices to Reduce Ammonia Emissions from Livestock Operations" to reflect ammonia's impact on PM2.5 concentrations. 39
4. Recommendations for the Transportation sector that will reduce PM2.5 39
4.1: Review and participate in studies of primary and secondary PM2.5 and precursor emissions from on-road sources. 39
4.2: Increase collaboration and air quality knowledge transfer with other state and local agencies and MPO staff in transportation planning activities. 40
5. Summary of Financial Support Needs 42
APPENDICES 43
Appendix A: House File 2418 44
Appendix B: PM2.5 Implementation Timeline 45
Appendix C: House File 627 and Amendment H-1250 46

Appendix D: Draft Revised Flowchart for Form MD 50
Appendix E: Department Summary and Analysis of PM2.5 Implementation Workgroup Recommendations..... 52

Fields of Opportunities

STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
PATRICIA L. BODDY, INTERIM DIRECTOR

December 30, 2010

The Honorable Chester J. Culver and
The State of Iowa General Assembly
State Capitol Building
1007 East Grand Ave
Des Moines, Iowa 50319

Dear Governor Culver and General Assembly:

Iowa Code 455B.134(14), signed into law on April 7, 2010, directs the Department of Natural Resources (Department) to develop recommendations for:

- Controlling PM2.5 (particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers)
- Controlling compounds that can form PM2.5 and
- Preventing ambient concentrations of PM2.5 that exceed federal air quality standards.

This report fulfills these requirements.

The Executive Summary provides a concise overview of the key recommendations and supporting financial needs to implement the PM2.5 standard in the State of Iowa. The Department believes these recommendations will allow for implementation of the PM2.5 standard in a manner that protects human health, while at the same time allowing for continued economic growth in the state.

The Department convened a workgroup to advise the Department per the requirements of HF 2418. Nearly ninety percent of the recommendations in this consensus report either match, or are closely based on, recommendations provided by the workgroup. One notable exception: The Department disagrees with the workgroup's recommendation to continue using larger particulate matter (PM10) as a surrogate for PM2.5 in permitting actions. The Department believes the continued use of PM10 as a surrogate for regulating PM2.5 is not protective of public health, and the report outlines additional reasons for the Department's position. Beginning January 1, 2012, the Department intends to end the use of PM10 as a surrogate for PM2.5 when reviewing air construction permit applications.

With a January 1, 2011 deadline, the workgroup and the Department faced a formidable task in the timely development of recommendations for the many relevant issues and concerns. Thanks to the willingness of workgroup members and Department staff who devoted the time necessary to craft these important recommendations, the legislative directive was met within the allotted timeframe.

The Department is grateful to the individuals and organizations that participated in the public input process through in-person meetings, conference calls, emails, and letter correspondence. This input was key in the development of the recommendations found in this report. Please feel free to call upon us if you have questions about the report or need additional information.

Sincerely,

Patricia Boddy, P.E.
Interim & Deputy Director

7900 Hickman Road, Suite 1 / Windsor Heights, Iowa 50324
515-242-5100 FAX 515-242-5094 http://www.iowacleanair.com/

1.0 Executive Summary

Background

To ensure that Iowan's have clean air to breath, the Department of Natural Resources (department) is required by federal and state law to develop state implementation plans that manage outdoor air resources so that existing, new, and modified sources of fine particulate matter (PM2.5) air pollution don't cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS).

House File 2418, passed during the 2010 legislative session, required the department to convene meetings and submit a report to the Governor and General Assembly by January 1, 2011 with recommendations:

1) For the establishment of a State Implementation Plan sufficient to control emissions of direct PM2.5 and PM2.5 precursors, and
2) To prevent ambient concentrations from exceeding the fine particulate matter (PM2.5) National Ambient Air Quality Standards (NAAQS) in all areas of the state.

Community, business and industry, agriculture, and transportation activities all contribute to PM2.5 in the atmosphere. Establishing appropriate plans and programs to address these contributions are the building blocks necessary to assure that the air Iowans breathe meets health based air quality standards. The first building block is the federal Prevention of Significant Deterioration (PSD) program that establishes requirements for very large sources of air pollution. Facilities that emit over 250 tons per year of at least one air pollutant (or 100 tons per year for specific types of facilities), are considered in this category. As required by Federal law, the department is already implementing the requirements of this building block.

The second building block includes plans and programs to address medium sized facilities and processes, those that emit less than the larger facility category, but more than exemptible levels. These facilities must be evaluated and permitted at levels that don't cause or contribute to violations of the National Ambient Air Quality Standards. It is this second building block of environmental review and permitting, combined with the additional building blocks of communities, agriculture, and transportation that are necessary to ensure equitable distribution of the responsibility to keep the air clean. These building blocks are the focus of the recommendations in this report.

To satisfy the requirements of HF 2418, the department first worked with stakeholders by facilitating a workgroup to obtain recommendations on these plans and programs. After evaluating those and other recommendations, the department developed this report making recommendations that meet the requirements of state and federal law.

This report recommends steps to reduce the existing high PM2.5 background values across the state. These steps, combined with steps to carefully manage the growth in emissions of PM2.5 and PM2.5 precursors, are necessary to ensure future opportunities for community and economic growth while at the same time maintaining adequate protection of public health.

Nearly ninety percent of the recommendations in this consensus report either match, or were closely based on, recommendations provided by the workgroup. The one notable exception is that the Department disagrees with the workgroup's recommendation to continue using larger particulate matter (PM10) as a surrogate for PM2.5 in permitting actions. The Department believes the continued use of PM10 as a surrogate for regulating PM2.5 is not protective of public health, and the report outlines additional reasons for the Department's position. Beginning January 1, 2012, the Department intends to end the use of PM10 as a surrogate for PM2.5 when reviewing air construction permit applications.

Existing Conditions

In Iowa, PM2.5 background values currently exceed 60 percent of the 24-hour PM2.5 NAAQS statewide. In much of eastern Iowa, PM2.5 background values currently exceed 80 percent of the NAAQS. During periods of high PM2.5 levels, emissions from motor vehicles, industrial processes, waste burning, and agricultural practices, that emit PM2.5 (or pollutants that form into PM2.5), combine to cause exceedances of the 24-hour PM2.5 NAAQS dozens of times annually over multi-county areas of the state. Direct emissions from industrial facilities also consume air resources and can cause exceedances of the standards.

PM2.5 Sources, Health Impacts, and Standard Levels.

PM2.5 is a complex pollutant. It is emitted directly into the air or can form when precursor pollutants react in the atmosphere to form PM2.5. PM2.5 and precursor emissions in Iowa are mainly from electricity generation, manufacturing, agricultural activities, and fuel combustion, including motor vehicles and industrial processes.

Iowa's high PM2.5 background values have the potential to slow or limit community growth and economic development in many areas of the state. Background values that are approaching the PM2.5 NAAQS mean that less of the ambient air resource is available for existing facilities to make expansions that may increase PM2.5 emissions. A lack of ambient air resource availability will also limit the construction of new facilities in an area. If the monitored PM2.5 values violate the PM2.5 NAAQS then the area could be declared in nonattainment with the standard. Existing sources that want to expand and new sources that want to locate into an area would have to apply the most stringent emissions controls technically feasible. Emissions increases would also have to be offset by equivalent or greater reductions in emissions within the nonattainment area. Depending on the scope of the nonattainment problems, existing sources may have to apply additional controls to continue operating at their current levels. New transportation projects would have to be reviewed to ensure that the projects will not result in increases in air pollution from vehicles.

The PM2.5 NAAQS establishes a limit on the acceptable exposure and public health impacts of fine particulate matter that is less than or equal to 2.5 micrometers in diameter. PM2.5 can easily by-pass most of the body's defense mechanisms and become lodged deep in the lungs, where the particles can cause coughing, or difficulty breathing, aggravated asthma; development of chronic bronchitis; nonfatal heart attacks; and premature death in people with heart or lung disease.

The U.S. Environmental Protection Agency (EPA) created a NAAQS in 1997 for this pollutant in order to better protect the public from the adverse impacts of PM2.5 on human health. EPA strengthened the PM2.5 NAAQS in 2006 based on reviews of the latest public health

information and scientific data, reducing the acceptable level of PM2.5 that humans can be exposed to from 65 micrograms per cubic meter of air (ug/m3) down to 35 ug/m3.

PM2.5 Implementation Workgroup

A workgroup was convened with approximately 120 members, with representative stakeholder participation from business and industry, agriculture, trade groups and associations, environmental groups, and local and State agencies. Workgroup members identified approximately 150 issues and concerns related to implementation of the new PM2.5 NAAQS. The issues and concerns were categorized into seven topic areas. Seven subcommittees were formed to develop recommendations to address each issue and concern in the seven topic areas. Each of the subcommittee recommendations were reviewed by the full workgroup, and if approved, presented to the department as a final recommendation. The workgroup recommendations are found in Appendix E by subcommittee (in alphabetical order).

Key Recommendations

The department considered each of the workgroup's recommendations and then developed the recommendations that are listed in this report. The department's recommendations that will reduce PM2.5 are divided into four primary areas: 1) recommendations for communities, 2) recommendations for business and industry, 3) recommendations for the agricultural sector, and 4) recommendations for the transportation sector. Additional financial support that is needed to effect the recommendations is also summarized. Listed below are key recommendations from the report. A full listing of all recommendations from the department is listed in Section 3 of this report.

Recommendations for Communities that will reduce PM2.5

1.1: Adopt legislation to prohibit open burning of residential waste within the limits of municipalities.

The Department supports a phased-in ban of residential waste burning in municipal areas. Such a ban will provide health, safety and aesthetic benefits for the citizens living in these areas. The ban would reduce levels of PM2.5 and air toxics in localized areas. Reduced levels of air pollution provide reductions that help to reduce PM2.5 values and prevent PM2.5 nonattainment which would stifle economic development. If legislation were adopted, the Department would need funding as specified in section 3 to implement a burn ban and to conduct an educational outreach campaign. The funding would also provide grants to supplement the Solid Waste Alternatives Program (SWAP) for local governments, regional planning organizations or other community service providers for start-up costs of disposal options such as citizen convenience centers, subsidized waste collection service, subsidized composting or chipping, or other such alternatives to burning.

1.2: Assure that PM2.5 ambient air levels are measured to facilitate protection of public health and continued timely community development.

Data generated from the PM2.5 ambient air monitoring network helps the department determine whether the plans and programs that it is implementing are protective of the PM2.5 NAAQS. For air construction permitting efforts, a distributed and well articulated monitoring network provides monitoring data that often satisfies pre-construction monitoring requirements for projects that trigger federal air construction permitting requirements, thereby allowing expedited permitting of major green field or industrial expansions across the state. The network also

provides for more refined, representative data to be used in the calculation of PM2.5 background values used in ambient air impact analyses conducted as part of air construction permitting projects. Maintaining the PM2.5 ambient air monitoring network will require additional funding as specified in section 3 of the report.

1.3: Adopt reduced idling legislation.
Reducing emissions from excess idling would reduce air pollutant emissions, save money by reducing fuel consumption and engine wear, and address public health concerns while still providing sufficient measures to run the vehicle for health and safety measures.

1.4: Encourage reductions in PM2.5 emissions through a public education campaign on the proper use of fireplaces, wood stoves, and outdoor wood boilers.
Establish a public education campaign, funded as recommended in section 3, to provide important information to citizens and local governments about residential wood heating. The department would utilize existing partnerships to launch a campaign in Iowa. The campaign's goal will be to assist residents with affordable, safe and convenient home heating options, while, at the same time, reducing PM2.5 emissions and protecting air quality in neighborhoods and in communities.

Recommendations for Business and Industry that will reduce PM2.5

2.1: Beginning on January 1, 2012, implement a permitting program that will control emissions of direct PM2.5 and prevent ambient concentrations from exceeding the PM2.5 National Ambient Air Quality Standards.
The Department disagrees with the workgroup's recommendation to continue using larger particulate matter (PM10) as a surrogate for PM2.5 in permitting actions. The Department believes the continued use of PM10 as a surrogate for regulating PM2.5 is not protective of public health, and the report outlines additional reasons for the Department's position.

Beginning January 1, 2012, the Department intends to end the use of PM10 as a surrogate for PM2.5 and will begin including PM2.5 evaluations into the existing air construction permitting program to manage emissions of direct PM2.5 and prevent ambient concentrations from exceeding the PM2.5 NAAQS. This will be accomplished by requiring new or modified sources of PM2.5 (unless otherwise exempted) to obtain an air construction permit limiting PM2.5 emissions sufficiently that it will not cause or contribute to a violation of the NAAQS, in accordance with statute. Existing permitted sources of air pollution will only require re-permitting if those emission sources, in the course of an evaluation of a new or modified source of PM2.5, are evaluated and it is determined that the existing emission source is causing or contributing to a violation of the NAAQS. Re-permitting may also be voluntarily requested by the facility.

EPA previously allowed states to utilize existing permitting and regulations of PM10 in lieu of specific PM2.5 requirements. EPA has since established adequate implementation tools and guidelines necessary to allow states to implement PM2.5 requirements directly. Using PM10 as a surrogate for PM2.5 does not logically provide adequate protection of public health. The PM10 standard allows up to 150 micrograms per cubic meter; whereas the PM2.5 standard only allows up to 35 micrograms per cubic meter. Putting aside differences in the calculation methods, most combustion sources and many other sources of emissions would greatly exceed

the PM2.5 standard if it were only regulated for PM10. Now that EPA has finalized implementation tools necessary to better characterize PM2.5 emissions, the use of PM10 as a surrogate for PM2.5 is no longer a reasonable method for permitting sources of PM2.5 emissions.

The department will proceed with updating the PM2.5 modeling guidance, with consultation of stakeholders, for non-Prevention of Significant Deterioration (PSD) air construction permit application projects to include thresholds that would trigger an ambient air impact analysis for PM2.5. These changes and other updates to permitting rules, guidance, and tools are discussed in detail in section 3.

2.2: Steps to ease the regulatory burden of PM2.5 implementation.
Specific steps aimed at reducing the regulatory burden to business and industry of implementing the PM2.5 standard has been included. Recommendations include updating of the exemptions from the requirement to obtain an air constriction permit, adoption of the recently promulgated EPA stack test methods for PM2.5, a focus on compliance assistance rather than enforcement for PM2.5 implementation, and creating a database of PM2.5 emission test results that is publicly accessible. Additional resource and staffing needs associated with implementation of the PM2.5 standard into the air construction permitting program are summarized in section 3.

Recommendations for the Agricultural sector that will reduce PM2.5

3.1: Expand the educational & outreach efforts to the agricultural community on best practices to reduce ammonia emissions from livestock operations and excess nitrogen application.

Background on ammonia emissions.
Information provided by some of the workgroup members showed that fine particle nitrate formation in rural areas plays an important role in elevated PM2.5 levels frequently monitored over large areas of the state, most often during the winter months. Ammonia is a key precursor gas for nitrate particulate formation. Winter nitrate studies recently conducted by Dr. Charles Stanier (assistant professor at the University of Iowa in Chemical and Biochemical Engineering) suggest that reductions in ammonia may be regulated to good effect, potentially reducing the formation of fine particulate nitrates. Ammonia emissions are highest from the agricultural production sector in Iowa, with a majority of the emissions coming from manure and fertilizer application and animal husbandry (report Figures 3.1 and 3.2).

EPA recently completed the National Air Emissions Monitoring study (NAEM study) for animal feeding operations. The sites selected for monitoring represented major animal groups (*i.e.*, swine, dairy, and poultry (broilers and layers), different types of operations, and different geographic regions, including Iowa. Pollutant monitoring focused on emissions from the animal housing and manure storage facilities and included ammonia, particulate matter, volatile organic compounds, and hydrogen sulfide. By November 2011 EPA anticipates publishing emission-estimating methodologies. This information will be used to determine the applicability of provisions of the Clean Air Act to livestock operations.

Department plans to address ammonia emissions
The department will defer consideration of state level regulations to regulate precursor ammonia emissions and direct PM2.5 emissions from agricultural operations until EPA has developed their emissions factors, modeling, sampling protocols and resulting regulations.

In the mean time, the department recommends expanded education and outreach activities to the agricultural community on best practices to reduce ammonia emissions from livestock operations and excess nitrogen application. Options for expanded education and outreach could include new or updated publications, workshops, demonstration sites, and assistance with facility owner/operator self assessments. The department would engage Iowa State University's Department of Agricultural and Biosystems Engineering along with the ISU Extension to develop and provide expanded education and outreach resources. The additional staffing needs to accommodate the expanded education and outreach activities are included in section 3.

Recommendations for the Transportation sector that will reduce PM2.5

4.1: Review and participate in studies of primary and secondary PM2.5 and precursor emissions from on-road sources.
Vehicular travel is vital to our economy and daily life, but is also responsible for generating significant quantities of emissions of fine particulate matter and PM2.5 precursors. Improving our understanding of on-road sources and their contributions to PM2.5 is a topic in need of continued research and development. Department participation and review of studies of direct and secondary PM2.5 and precursor emissions from on-road sources are needed to facilitate this improved understanding of emissions contributions and impacts from on-road sources.

4.2: Increase collaboration and air quality knowledge transfer with other state and local agencies and MPO staff in transportation planning activities.

An increased collaboration and air quality knowledge transfer with other state and local agencies and metropolitan planning organization (MPO) staff in transportation planning activities will also facilitate improving the understanding of contributions to PM2.5 levels by on-road vehicles. Effective partnering and collaboration would improve the development of information needed to make informed decisions relating to transportation and air quality connections. Staffing needs necessary to allow the department to review and participate in studies of direct and secondary PM2.5 and precursor emissions from on-road sources and to increase collaboration and air quality knowledge transfer with other state and local agencies and MPO staff in transportation planning activities is included in section 3.

Summary of Financial Support Needs
PM2.5 air pollution is an issue which affects all citizens of the State of Iowa and therefore should be funded by the State who is charged with protecting their health and welfare. A majority recommendation of the workgroup was that the Iowa General Assembly adequately fund the department's Air Quality Bureau to implement the PM2.5 NAAQS. The funding requests and associated FTEs for each of the department recommendations are summarized below by one-time funding needs (Table 1) and on-going annual funding needs (Table 2).

Table 1: Summary of Funding Request (One Time)	Amount	FTE
1.1 Residential Waste Outreach &Education Campaign -Community survey, education and outreach campaign- $350,000 over 2 years -Grants to communities- $1,000,000 over 2 years	$1,350,000	*
1.4 Proper Use of Wood Burners Education & Outreach Campaign -Survey, education & outreach campaign- $150,000 over 2 years	$150,000	*
2.2.3 Public Access to PM2.5 Emission Test Data	$40,000 - $80,000	None

*See Table 2

Table 2: Summary of Funding Request (On-going)	Amount	FTE
1.1 and 1.4 Residential Waste and Wood Burner Outreach &Education Campaigns and on-going assistance (2 FTEs)	$150,000	2.0
1.2 Ambient Air Monitoring -Equipment operation and maintenance- $450,000 -Two FTEs- $150,000	$600,000	2.0
2.1.2 Review and Update General Permit Templates, On-going Permit Review (1 FTE)	$75,000	1.0
2.2.2 PM2.5 Stack Test Observer (1 FTE)	$75,000	1.0
2.2.4 PM2.5 Compliance Assistance (1 FTE)	$75,000	1.0
3.1 Expand Education & Outreach to Reduce Ammonia Emissions and Conduct Planning Activities (1FTE)	$75,000	1.0
4.1 and 4.2 Transportation Planning and Studies for Air Quality (1 FTE)	$75,000	1.0

2.0 Background

Fine Particulate Matter (PM2.5) Levels, Health Impacts, and Sources.

On most days the majority of Iowans enjoy clean air. This is due to a combination of factors including how much air pollution is being emitted into the air, where that pollution is being emitted, how wind speed and direction disperse pollution, and the influence of on-going federal, state, and local regulatory programs. However, motor vehicle, industrial, waste burning, and agricultural practices that emit fine particulate (or pollutants that form into fine particulate) cause dozens of days each year where the air quality is so poor that pollution levels in the air exceed federal standards that are set to protect public health.

Particles that are equal to or less than 2.5 micrometers in diameter (fine particles or PM2.5) are easily inhaled deep into the lungs where they may accumulate, react, be cleared, or absorbed. Scientific studies have linked particle pollution, especially fine particles, with a series of significant health problems, including: increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, aggravated asthma; development of chronic bronchitis; nonfatal heart attacks; and premature death in people with heart or lung disease. More information on the human health and environmental impacts of PM2.5 can be found at http://www.epa.gov/air/particlepollution/health.html.

Because of substantial concerns about the health consequences of inhaling fine particulate, the U.S. Environmental Protection Agency (EPA) created a National Ambient Air Quality Standard (NAAQS) in 1997 for this pollutant in order to protect public health. In 2006, based on the latest public health studies and scientific data, EPA increased the stringency of the 24-hour PM2.5 standard lowering the level of the standard from 65 micrograms per cubic meter of air (ug/m3) down to 35 ug/m3.

PM2.5 levels across Iowa are close to or violate the federal NAAQS (Figure 2.1). Violations of the NAAQS can lead to federal designations of areas as being in "nonattainment" with the standards or requirements to reduce emissions at existing sources of pollution. Not only does this designate the area as posing a high risk to public health, the designation of nonattainment restricts economic growth, impacts transportation planning, and can cause restrictions in federal environmental and highway funding. Significant state, local, and industry resources must be used to bring the area back into attainment with the standards to quickly improve air quality and remove the stigma of a nonattainment designation.

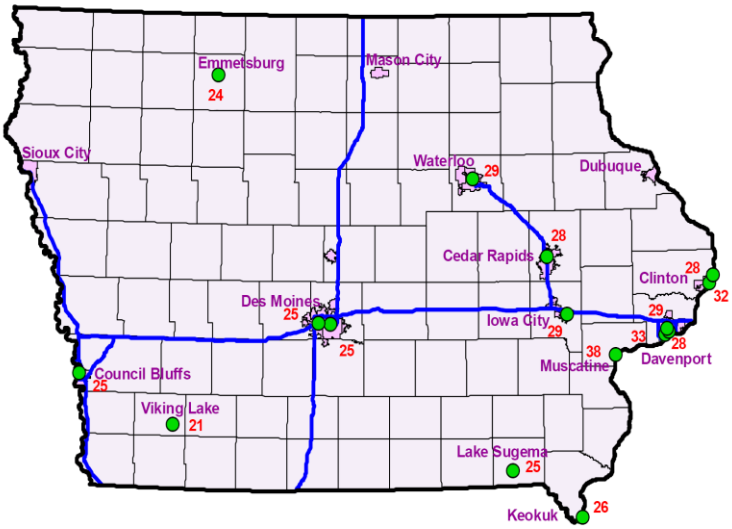


Figure 2.1: 24-hour monitored PM2.5 design values (2007-2009).

PM2.5 is a complex pollutant. It may be emitted directly into the air (direct emission) or it can form when pollutants react in the atmosphere (secondary formation). Direct PM2.5 emissions in Iowa are emitted mainly from non-point and point sources (Figure 2.2).

"Non-point source" is an emissions inventory classification that includes aggregates of emissions of smaller stationary sources, and can include smaller point sources. Non-point sources of PM2.5 include agricultural operations, road dust, road construction, residential, commercial, and industrial construction and fuel combustion, open burning of residential waste, quarrying and mining activities, and minor source industrial processes.

Point sources of direct PM2.5 emissions include primarily electricity generation, manufacturing, and agricultural products processing. Both on and off road vehicles contribute to direct PM2.5 emissions along with natural events such as managed burns and wildfires (events).

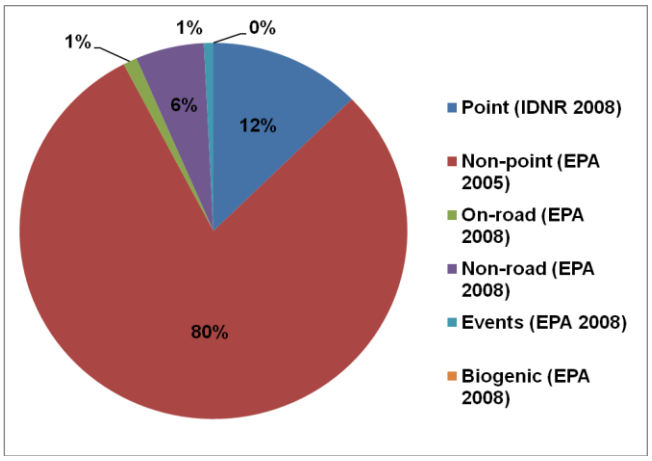


Figure 2.2: PM2.5 direct emissions by source category (Source: Department and EPA emissions inventory data).

Pollutants that lead to the secondary atmospheric formation of PM2.5 are called "precursor emissions." Precursor emissions, which include nitrogen oxides (NOx) (Figure 2.3), sulfur dioxide (SO2) (Figure 2.4), ammonia (NH3) and volatile organic compounds (VOC) undergo transformations in the atmosphere to form PM2.5. Based on the department and EPA emission inventory data, the point sources of NOx and SO2 are primarily electricity generation, fuel combustion and manufacturing. Ammonia emissions are predominately from agricultural production (fertilizer application and animal husbandry) while VOC emissions are predominately from biogenic or natural sources, such as plant growth and decomposition.

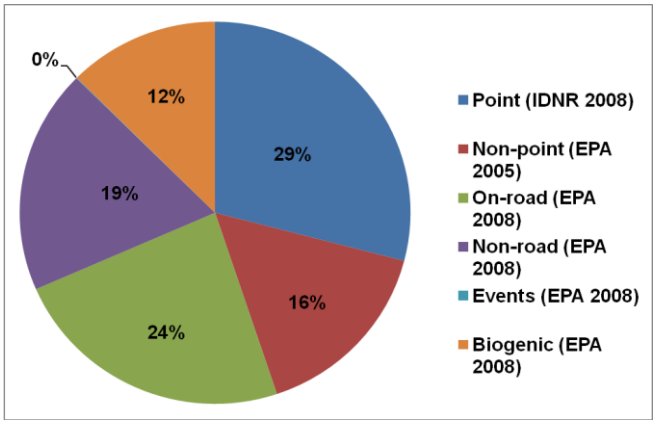


Figure 2.3: NOx emissions by source category (Source: Department and EPA emissions inventory data).

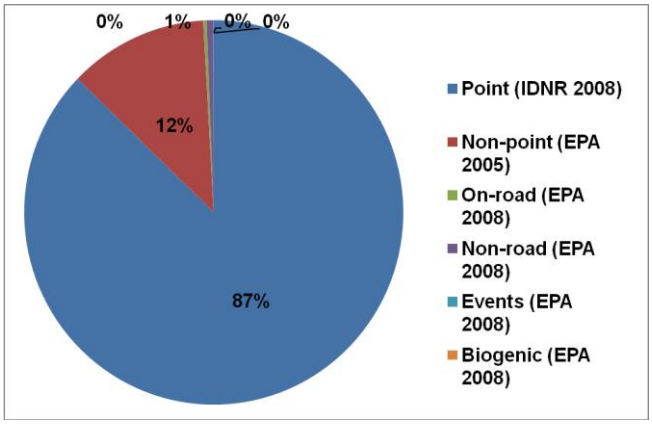


Figure 2.4: SO2 emissions by source category (Source: Department and EPA emissions inventory data).

A large portion of the NOx emissions from on-road vehicles (Figure 2.3) occurs from heavy duty diesel vehicles (semi-trucks, buses, and motor homes) and light duty gasoline vehicles (passenger cars and trucks). The majority of NOx emissions from non-road vehicles (Figure 2.3) comes from agricultural tractors and combines. The balance of the NOx emissions from non-road vehicles originate mainly from construction and mining equipment consisting of endloaders, bulldozers, dumptrucks, and excavators.

Point source emissions of SO2 (Figure 2.4) come largely from electrical generation facilities. The manufacturing sector also contributes to point source SO2 emissions, primarily from the food and kindred products, stone-clay-glass and concrete products, and industrial and commercial machinery source sectors. Some of the facilities in these classifications have coal-fired boilers. Nonpoint source emissions of SO2 are primarily generated by residential, commercial, institutional and industrial fuel combustion.

Additional information regarding sources of ammonia and VOC emissions is provided in section 3 of this report.

Development of Recommendations.

To ensure that Iowan's have clean air to breath, the department is required by federal and state law to develop plans to make sure that new or modified sources of fine particulate air pollution or it's precursors don't cause or contribute to violations of the air quality standards.

In 2010, the Iowa General Assembly passed and Governor Culver signed House File 2418 (codified in Iowa Code 455B.134(14)) requiring the department to convene meetings and submit a report to the Governor and General Assembly by January 1, 2011 with recommendations 1) for the establishment of a State Implementation Plan sufficient to control emissions of direct PM2.5 and PM2.5 precursors and 2) to prevent ambient concentrations from exceeding the PM2.5 NAAQS in all areas of the state. The full text of House File 2418 is included in Appendix A.

In this two step process, the department first worked with stakeholders by facilitating a workgroup to obtain input on implementation issues, and then after evaluating those and other recommendations have developed this report making recommendations that meet the requirements of state and federal law.

The PM2.5 Implementation Workgroup (workgroup) was formed in May 2010 to provide input to the department on approaches for implementing the 2006 PM2.5 NAAQS. The workgroup consisted of approximately 120 members, with representative stakeholder participation from industry/business, agriculture, trade groups and associations, environmental groups, and local and state agencies.

The workgroup objectives included:

- Review the current regulatory requirements and recommend to the department any revisions as may be appropriate.
- Advise the department of program areas, guidance, procedures, and policies that should be updated.

- Identify additional information that is needed to implement the new standard and advise on the approaches and efforts that may be necessary to provide the required information.
- Advise the department of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for implementing the new standard.

Workgroup members identified approximately 150 issues and concerns related to implementation of the new PM2.5 NAAQS. The issues and concerns were categorized into seven topic areas. Subcommittees were formed to address each topic area. Each identified issue and concern was reviewed by the applicable subcommittee and recommendations were developed for consideration by the full workgroup. Recommendations accepted by the full workgroup were submitted to the department as the formal workgroup recommendations. Regarding how the department should address each issue or concern. A full summary and analysis of the workgroup's activities and recommendations is provided in Appendix E.

State Implementation Plan Requirements

The Clean Air Act (CAA) requires states to develop a plan that outlines how the state will attain and maintain the ambient air quality standards. The plans are known as State Implementation Plans, or SIPs, and are reviewed and approved by EPA. When a new ambient air quality standard is promulgated or an existing standard is revised, all states are required to submit SIPs with infrastructure elements showing that the state has the capacity to attain, maintain, and enforce a new or revised ambient air quality standard.

State Implementation Plan submittals must include the basic program requirements for managing air quality required in section 110(a)(2) of the CAA (42 USC §7410). The required infrastructure SIP elements are as follows:

Section 110(a)(2)(A) Emission limits and other control measures.
Section 110(a)(2)(B) Ambient air quality monitoring/data system.
Section 110(a)(2)(C) Program for enforcement of control measures.
Section 110(a)(2)(D)(i) Interstate pollution transport.
Section 110(a)(2)(E) Adequate authority and resources.
Section 110(a)(2)(F) Stationary source monitoring system.
Section 110(a)(2)(G) Emergency power.
Section 110(a)(2)(H) Future SIP revisions.
Section 110(a)(2)(J) Consultation with government officials; Public notification; PSD and visibility protection.
Section 110(a)(2)(K) Air quality modeling/data.
Section 110(a)(2)(L) Permitting fees.
Section 110(a)(2)(M) Consultation/participation by affected local entities.

Iowa's SIP revisions for the 2006 PM2.5 NAAQS was required to be submitted to EPA in September 2009. However, due to the delayed promulgation of several key federal regulations and guidance documents needed to fully implement the 2006 PM2.5 standard, it was not possible for states to submit a complete SIP to EPA by this regulatory deadline. The necessary federal regulations and guidance documents have since been promulgated and the department has established a timeline (Appendix B) for adoption of administrative rules and a SIP revision that will allow the department to make a complete SIP submittal to EPA by July 2011.

Implementation of many of the recommendations included in this report will facilitate the department's efforts to complete and submit an approvable SIP for PM2.5 to EPA.

3.0 Implementation Recommendations

The following recommendations are necessary for 1) the establishment of a State Implementation Plan (SIP) sufficient to control emissions of direct PM2.5 and PM2.5 precursors and 2) to prevent ambient concentrations from exceeding the PM2.5 NAAQS in all areas of the state (HF 2418).

These recommendations strive to balance the burden of reducing fine particulate emissions from a multitude of sources while allowing for shared utilization of our air resource by competing sectors over time.

Recommendations that will reduce PM2.5 and aid the department in completing and submitting a SIP to EPA are divided into four categories: 1) recommendations for communities, 2) recommendations for business and industry, 3) recommendations for the agricultural sector, and 4) recommendations for the transportation sector. Each recommendation includes additional background information, a description of why each recommended action is needed and would be beneficial, and where applicable, necessary legislative or administrative actions and budget needs. Financial support that is needed to affect the recommendations is summarized in Section 5.

1. Recommendations for Communities that will reduce PM2.5

1.1: Adopt legislation to prohibit open burning of residential waste within the limits of municipalities.

The department estimates that at least 180 municipalities in Iowa still allow some burning of household trash. Many more municipalities still allow burning of leaves and other landscape waste. Residents in cities are typically in closer proximity to residential waste burning, and are therefore more likely than rural residents to be adversely impacted by the air pollutants emitted.

Since 2000, the department has provided education materials and support to communities and interest groups to assist these groups in enacting local ordinances to ban trash and leaf burning. Outreach efforts included: city council presentations, radio and TV spots, open burning brochures, webpage information, posters, and outreach at the state fair.

In 2004-2005, the department, in cooperation with the Department of Public Health, conducted a survey of trash and leaf burning in all 948 Iowa municipalities. Nearly 90% of the cities responded to the survey. The survey results indicated that approximately 70% of cities have enacted local ordinances to ban trash burning. The remaining 30% still allow some trash burning.

In 2006-2007, the department convened a stakeholder workgroup to explore ideas and approaches for restricting or eliminating residential trash burning which included the Departments of Elder Affairs (now Department on Aging), Public Health, Public Safety, East

Central Council of Government, Iowa League of Cities, Iowa State Association of Counties, and several counties and solid waste agencies. There was majority support for a phased-in ban on trash burning in cities; however, several groups preferred local initiatives and ordinances over a state-instituted ban. All participating stakeholders strongly supported educational campaigns and state assistance to cities and counties to reduce residential trash burning.

The results from the 2004-2005 survey indicated that nearly 87% of the cities still allow leaf burning. At that time, nearly 30% of the cities that still allow leaf burning have composting or drop off sites available for residents.

Need and Benefits of a Burn Ban.
Smoke from trash and landscape waste burning releases harmful fine particles (soot and ashes) as PM2.5, carbon monoxide, toxic air pollutants, and reactive gasses that can contribute to smog formation. Leaf burning releases the hazardous chemical, benz(a)pyrene, which is known to cause cancer in animals and is believed to be a factor in some types of lung cancer. Burning household trash releases dioxin. Dioxins are toxic even at extremely low levels, and have been linked to serious health problems, including cancer.

Residential waste burning also is a fire hazard, resulting in several deaths, numerous injuries, and thousands of dollars in property damage each year. Further, the smoke and ash from residential waste burning is a nuisance and can impair the aesthetics of the environment.

Within the last ten years alternative disposal options have become more accessible and economical. This is particularly true in municipalities (cities). Additionally, residential waste burning is increasingly recognized as a risk to human health and environmental health, as well as a safety hazard and a nuisance.

A phased-in ban in municipal areas will provide health, safety and aesthetic benefits for the citizens living in these areas. The ban would reduce levels of PM2.5 and air toxics in localized areas. Reduced levels of air pollution provide reductions that help to prevent PM2.5 nonattainment which would stifle economic development.

Past Legislative and Administrative Actions.
The department has administrative authority, under 455B.133, to adopt rules pertaining to the abatement, control and prevention of air pollution, including open burning. Air quality rules in place for over thirty years generally prohibit open burning. However, the open burning prohibition contains a number of exemptions, including an exemption to allow burning of residential waste in most areas. Thirty years ago, residential waste burning was often considered necessary because waste management options were not widely available or affordable.

In 2000, the department proposed rules to eliminate residential trash and leaf burning in cities, and in rural areas within 500 feet of schools, homes or other occupied buildings. Some stakeholders commented adversely on the proposal, voicing concern that they were not sufficiently involved in the rulemaking process, and that alternative disposal options were not widely available. The department subsequently withdrew the proposal.

The department proposed a phased-in ban on the burning of residential waste (household trash and landscape waste) in municipalities during the 2009 legislative session. The proposal, passed by the House Environmental Protection Committee as House File 627, would have amended 455B.133 to specify that the department shall adopt rules to implement a phased-in ban on the burning of residential waste in municipalities (cities).

The residential burn ban was recorded on 2/3/09 as study bill 1155 in the Senate's Environment & Energy Independence committee and was heard on 2/18/09. The residential burn ban advanced much further in the House, starting as study bill 90 in the Environmental Protection committee. It ended the session in the House Ways and Means committee as HF 627. The history is listed below:

January 26, 2009: Date Recorded; Environmental Protection: Smith, Chair, Gaskill, M., and Anderson.
February 3, 2009: 11:15AM; House Lobbyist Lounge Environmental Protection.
February 11, 2009: 11:45AM; House Lobbyist Lounge Environmental Protection.
February 17, 2009: 12:30PM; House Lobbyist Lounge Environmental Protection.
March 2, 2009: Voted - Environmental Protection.
March 10, 2009: Introduced as HF 627, placed on calendar. (H.J. 717).
March 23, 2009: Amendment H-1250 filed. (H.J. 992).
March 26, 2009: Referred to Ways & Means. (H.J. 1046).

Legislative Recommendation
The department recommends that the Governor and the Iowa General Assembly adopt legislation in the 2011 legislative session that is comparable to HF 627 and amendment H-1250 proposed in the 2009 legislative session. Copies of House File 627 and Amendment H-1250 are included in Appendix C.

The department also offers the following legislative proposal for the 2011 legislative sessions that would incorporate the text from HF 627, as amended with H1250, and new phase in dates.

NEW SUBSECTION. 455B.133(11)
a. Adopt rules to prohibit the open burning of residential waste within any of the following areas:
(1) Beginning January 1, 2012, any city with a population of two thousand five hundred or more.
(2) Beginning January 1, 2013, any city with a population of one thousand or more.
(3) Beginning January 1, 2014, any city with a population of five hundred or more.
(4) Beginning January 1, 2015, any city in the state.
b. The population of a city as described in this subsection shall be based on the most recent federal decennial census.
c. The rules shall allow for conducting prescribed burns for purposes of restoring, reconstruction of, or managing natural area vegetation such as prairies, grasslands, wetlands, woodlands, or wildlife habitat areas; managing land under the federal conservation reserve program under 7 C.F.R. pt. 1410; and managing buffer strips, pastures, or field borders.
d. This subsection shall not apply to the burning of landscape waste originating on agricultural land, provided that the burning of trees and tree trimmings occurs at least one quarter mile from any building inhabited by a person other than the landowner, a tenant, or an employee of the landowner conducting the burning.

e. This subsection shall not apply to the open burning of natural disaster rubbish caused by a natural disaster for which the governor proclaims a disaster emergency pursuant to section 29C.6. Natural disaster rubbish includes but is not limited to landscape waste and demolished or damaged structures.
f. This subsection shall not apply to supervised open burning at a tree and tree trimming burning site operated by a political subdivision.
g. A person who is found in violation of the prohibition on burning residential waste under this subsection shall not be subject to an enforcement action other than the assessment of a civil penalty pursuant to section 455B.109. Criminal penalties provided in section 455B.146A shall not apply to violations of the provisions of this subsection.

Budget Request and Needed Resources
Implement ban and provide funds for one FTE, conducting a community survey, conducting an educational outreach campaign and providing grants to communities: $1,500,000 over 2 years (sum of totals below)

1. One new FTE ($75,000) to:
   1) Conduct a new survey of municipalities to supplement the survey conducted in 2004-2005 (described above), including tabulating and reporting on the results;
   2) Conduct an on-going statewide education and outreach campaign (in advance of, and during, the ban period) and assistance activities related to the burn ban; and
   3) Administer a competitive grant program to supplement the existing Solid Waste Alternatives Program (SWAP) for waste management start-up projects, and to start a pilot program for the department/local law enforcement partnerships to enforce the state open burning regulations.

2. $50,000 over 1 year: Cost to conduct a new survey of Iowa's 948 cities to update the survey conducted in 2004-2005. The cost includes tabulating the survey results, preparing a summary report of the survey results, and also using the results to direct the educational outreach campaign and target available grants for open burning alternatives.

3. $300,000 over 2 years: Materials/Resources cost to conduct an educational outreach campaign in advance of and during the burn ban. Costs will cover activities such as public service radio and TV spots (recurring), webinar public service videos (ongoing), billboards (recurring), and pamphlets (one-time).

4. $1,000,000 over 2 years: Cities impacted by the burn ban will need to find alternatives to burning, such as recycling, land filling, composting and chipping. The grant program would provide funds to supplement the SWAP program for local governments, regional planning organizations or other community service providers for start-up costs of disposal options such as citizen convenience centers, subsidized waste collection service, subsidized composting or chipping, or other such alternatives to burning.

1.2: Assure that PM2.5 ambient air levels are measured to facilitate protection of public health and continued timely community development.

The state contracts with the University of Iowa's State Hygienic Laboratory and the Linn and Polk County Local Programs to collect air monitoring data, quality assure the results, and report the data to the public. The department develops and administers these contracts, performs data analysis, develops monitoring reports, implements new monitoring requirements, helps site new monitors, and participates in monitoring workgroups at the state and national level.

Monitoring methods are designated by EPA and vary by pollutant. Some methods are capable of measuring a pollutant concentration in real time while others require a sample to be collected and later analyzed in a laboratory. To compare monitored concentrations to the NAAQS an approved federal method must be used. Particulate matter monitoring for comparison to the NAAQS requires air samples to be collected on filters for analysis. In order to keep the public informed about current particulate matter levels the department has deployed several samplers across the state capable of providing real time concentrations. These concentrations can be viewed following the links on the monitoring website at http://www.iowadnr.gov/air/current/current.html.

The number of PM2.5 monitoring sites has grown over the years in response to new federal monitoring requirements, revised air quality standards, and special projects. As of June 1, 2010, PM2.5 is currently measured with 23 monitors across the state (Figure 3.1). The frequency of measurements varies by site. Monitoring sites are located in 1) open, rural areas to determine general background levels or the amount of pollution entering the state; 2) near industrial facilities to determine the impacts of emissions from different sources on the PM2.5 NAAQS; and 3) in urban areas to assess population exposure. A complete listing of the PM2.5 monitor locations and frequency of monitoring for PM2.5 is summarized at http://www.iowadnr.gov/air/prof/monitor/monitor.html.

Data generated from the PM2.5 monitoring network helps determine whether the PM2.5 NAAQS are being attained, allows trends in monitored values over time to be evaluated, informs about relative contributions of different types of PM2.5 to the overall measured PM2.5 values at select locations, and guides future planning and permitting efforts. For air construction permitting efforts, a distributed and well articulated monitoring network provides monitoring data that often satisfies pre-construction monitoring requirements for projects that trigger federal air construction permitting requirements, thereby allowing expedited permitting of major green field or industrial expansions across the state. The network also provides for more refined, representative data to be used in the calculation of PM2.5 background values used in ambient air impact analyses conducted as part of air construction permitting projects.

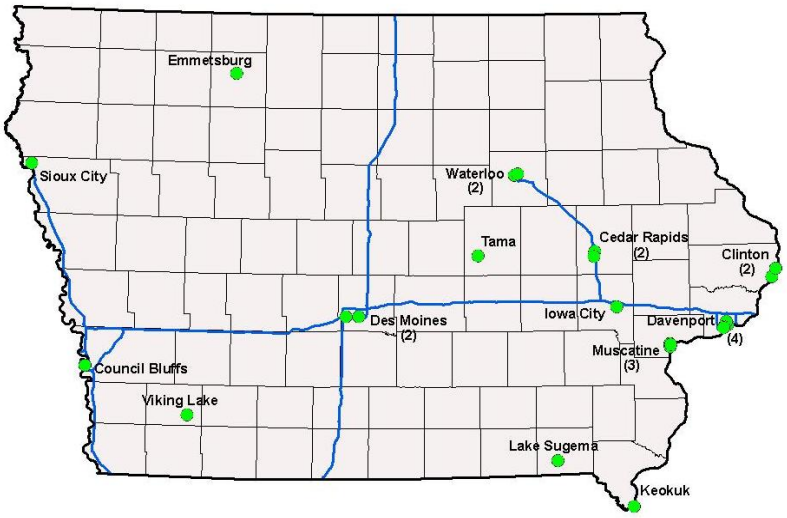


Figure 3.1: PM2.5 monitor sites as of June 1, 2010

Generating high quality ambient air monitoring data is important for environmental decision making. However, there are resource limitations on the number of monitors the state can operate. There are also logistical considerations that limit where a monitor can be located, including proximity of structures (such as trees or buildings) that could influence the monitor measurements, access to utility connections, and the availability of property owners willing to allow a monitor to be located on their property for one or more years.

Budget Request and Needed Resources

Federal funds supporting PM2.5 monitoring will decline starting in federal fiscal year 2013 and are anticipated to end in FFY 2016. Given the federal fiscal outlook and the current economic situation, the future federal funding is highly uncertain. Funding is currently provided by Title V fees, federal funds, State General Funds, and Environment First funds. The state funding will be critical to allow the department to continue to provide stable support for the PM2.5 monitoring network. An estimated $450,000 annually is needed to maintain a reliable ambient air quality monitoring network for PM 2.5. The department also requests $150,000 for 2 additional full-time equivalent (FTE) to allow for expanded review and analysis of PM2.5 monitoring data.

1.3: Adopt reduced idling legislation.

The workgroup recommended the department pursue legislation to reduce emissions from idling vehicles. Reducing emissions from excess idling would reduce air pollutant emissions, save money by reducing fuel consumption and engine wear, and address public health concerns while still providing sufficient measures to run the vehicle for health and safety measures. If an engine is running when it isn't needed, fuel is wasted, unnecessary engine wear is occurring, and the exhaust is polluting the air. Many companies that operate in Iowa, such as Cessford Construction/Oldcastle Materials Group and the McAnich Corporation, have adopted idle reduction measures.

Legislative Recommendation or Administrative Actions.
The department supports both legislation and non-regulatory approaches for reduced idling. The department has no specific legislative approaches to present at this time and defers to the General Assembly.

The State of Iowa, for example, has approximately 950 vehicles in its fleet. If every vehicle reduced unnecessary idling by 5 minutes each month, 79 hours worth of fuel and engine wear could be reduced. It is difficult to quantify potential savings without knowing the level of idling and fuel costs on each vehicle type. The cost savings could be significant and the reduced air quality impact is beneficial to all Iowans.

1.4: Encourage reductions in PM2.5 emissions through a public education campaign on the proper use of fireplaces, wood stoves, and outdoor wood boilers.

Alternative fuel sources for home heating have become more popular in Iowa as the cost and availability of petroleum-based fuels fluctuates. In both rural and residential areas, the use of wood burning devices, such as wood stoves and outdoor wood furnaces has increased. In particular, outdoor wood furnaces are increasingly used due to their relative affordability, convenience, and the perception that these units are "green" because they burn renewable fuels.

Outdoor wood furnaces are also called outdoor hydronic heaters and are more commonly called outdoor wood boilers or OWBs. OWBs are free standing wood burning appliances that heat water, which is then pumped into one or more structures to provide heat. Units are typically the size and shape of a small storage shed or mini-barn. OWBs are somewhat unique from other wood burning equipment such as wood stoves, pellet stoves, and fireplaces because OWBs tend to be much larger and differ in design and operation. OWBs typically have smoke stacks that are nearer to the ground than other wood burning appliances. Additionally, OWBs tend to have a much higher fuel capacity than other residential wood heaters.

OWBs and similar residential wood burning devices can emit significant quantities of air pollutants, including PM2.5 (EPA BurnWise: www.epa.gov/burnwise/healtheffects.html). In fact, relative to oil and gas fired furnaces, most conventional residential wood burning appliances are large emitters of PM2.5 (EM Magazine, May 2010: Air and Waste Management Association). Even wood stoves meeting EPA requirements for manufacturer certification emit 85 times more PM2.5 than oil or gas furnaces (Ibid). Moreover, OWBs may emit almost 12 times more PM2.5 than EPA-certified wood stoves, 1000 times more than oil furnaces, and 1,800 times more than natural gas furnaces (Ibid).

EPA does not yet have manufacturer certification regulations applicable to OWBs. EPA does have a voluntary manufacturer qualification program for OWBs. OWBs meeting EPA qualifications are between 70-90% cleaner than non-qualified models. EPA is considering amendments to the 1988 air quality regulations for manufacturers and distributors of wood burning equipment. The proposed federal rulemaking would tighten standards for wood stoves and would set emissions standards for other wood burning devices such as OWBs. However, EPA's regulations are not expected to be finalized until at least July 2012, with an effective date up to a year later, and would apply only to new units (**not** to existing wood burning units).

Needs and Benefits of a Public Education Campaign
Complaints have increased to the department and to the EPC about adverse air quality impacts from wood burning devices. Most of the complaints arise from smoke in neighborhoods from outdoor wood burning devices, primarily OWBs. In some cases, Department field staff find that OWBs and similar outdoor appliances are being operated improperly or are inadequately maintained. In other cases, wood burning devices contribute to air quality impacts because they are poorly located or installed and have inadequate stack heights to allow for air quality dispersion. Additionally, many older units are simply sized and designed such that they emit more air pollution than newer, more efficient units.

Unfortunately, some OWB manufacturers and distributors appear to have provided inadequate or misleading product information to consumers regarding air quality emissions. The Iowa Attorney General's office has sent letters to many of these companies advising them of Iowa consumer and environmental regulations. Because residential heating units are exempt from the requirement to obtain air permits, the department does not have an inventory of residential wood burning appliances.

Many citizens are unaware of best practices for wood burning, the Hearth, Patio, and Barbecue Association (HPBA) recommendations for proper installation and siting, or EPA's OWB qualification program. Further, many local officials have requested tools to address residential wood smoke in their communities. Some local governments are considering ordinances to address problems specific to their communities. The department is aware of three communities, Linn County, the City of Atlantic, and the City of Center City, that have enacted local ordinances regulating wood burning appliances for residential heating.

A department public education campaign will provide important information to citizens and local governments about residential wood heating. The department would utilize existing resources and partners, such as EPA's BurnWise and OWB qualification programs, HPBA's guidance, and other states outreach tools to launch a campaign in Iowa. The campaign's goal will be to assist residents with affordable, safe and convenient home heating options, while, at the same time, reducing PM2.5 emissions and protecting air quality in neighborhoods and in communities. The department will also assist local governments in providing tools to residents, and with enacting local ordinances, as appropriate.

Necessary Administrative Actions
The department recommends that the educational campaign consist of the following activities:

- Conduct a survey of local communities and wood burning appliance distributors to estimate the number of OWBs and other wood burning devices operating in Iowa, and specific community issues with these devices (citizen complaints, local ordinances in effect or being contemplated, etc.). Depending on available resources, the survey of local communities may be statewide or may be limited to areas of greater concern for PM2.5 ambient air impacts.

- Produce and disseminate billboards, pamphlets, news releases and listserves, as well as radio, TV and web-based public service announcements to educate and assist citizens and local governments on the following:

- "Best Burn" Practices. Provide tips and resources to save money, reduce air pollution and protect health, such as burning only seasoned hardwoods, steps for proper equipment operation and maintenance, etc.
- Choosing the right wood burning appliance. Promote EPA certified wood stoves and EPA-qualified OWBs as alternatives to other units that may be dirtier and less efficient. Explain important considerations for sizing equipment for residential needs.
- Supporting Proper Siting and Installation. Provide tips and graphics for ensuring that neighbors and communities are not adversely impacted by wood burning, particularly OWBs. Include recommendations for separation distance, smoke stack heights and consideration of prevailing wind direction.

Budget Request and Needed Resources
Launching a successful education campaign for residential wood heating will require staff time and resources currently not available to the department or to the Air Quality Bureau. To successfully complete the educational campaign objectives described above, the department requests the following funds:

1. 1.0 FTE ($75,000) to implement an educational campaign for residential wood burning and provide on-going general education, outreach and related assistance.

2. $150,000 over 2 years: Material costs to cover survey (1 time), public service radio and TV spots (seasonal recurring), webinar public service video (ongoing), billboards (seasonal recurring), and pamphlets (one-time)

1.5: Seek public input on ideas for use of federal diesel emissions reduction act (DERA) funding.

The department receives federal funding under the diesel emissions reduction act (DERA) to reduce diesel emissions. Diesel exhaust contains significant amounts of PM2.5 and has been determined to be a likely human carcinogen. Historically the DERA funding has been applied to the retrofit of older school buses and the purchase of new school buses. The department partnered with School Administrators of Iowa to disseminate and implement the Clean School Bus USA program. School districts have supplied the federal "match" or complimenting funds with staff time on the retrofits and a portion of new school buses purchase.

The federal American Recovery and Reinvestment Act (ARRA) of 2009 provided the department with $1,730,000 to be applied to reduce diesel emissions. Efforts were made to competitively expand the reach of the program to businesses and communities. Grants were awarded to trucking companies, municipalities, school districts, and other businesses.

Necessary Administrative Actions
The department, in concurrence with the workgroup recommendation, will follow a similar approach used with the ARRA funds on future projects, within the limits placed on the use of the funds by EPA. Input will be requested via list serve and Air Quality Client Contact meetings.

The DERA grants typically allow states to use a small percentage of the grant funds to cover administrative costs, such as staff time spent on managing contracts associated with the grant awards to sub-grantees. No additional resources or staff will be necessary to complete this action.

1.6: Encourage individuals to reduce their air pollution footprint through the expanded use of social media.

Necessary Administrative Actions

The department will provide information for updates to Twitter, Facebook, and other social media outlets on what individuals can do to reduce PM2.5 and other types of air pollution. The department will also promote positive actions taken by business and industry. Using the Internet will allow the department to provide the outreach with existing staff.

Topics could range from air awareness issues, such as reducing unnecessary idling, composting leaves rather than burning them, seasonal issues for ozone, and other measures that individuals can do to reduce their air quality impact. No additional resources or staff will be needed to complete this action.

2. Recommendations for Business and Industry that will reduce PM2.5

2.1: Beginning on January 1, 2012, implement a permitting program that will control emissions of direct PM2.5 and prevent ambient concentrations from exceeding the PM2.5 National Ambient Air Quality Standards.

In areas where the standard is being met, new or modified sources of PM2.5 will be required (unless it is exempted) to obtain an air construction permit limiting PM2.5 emissions sufficiently that it will not cause or contribute to a violation of an ambient air quality standard, in accordance with statute. Existing permitted sources of air pollution will only require re-permitting if those emission sources, in the course of an evaluation of a new or modified source of PM2.5, is evaluated and it is determined that the existing emission source is causing or contributing to a violation of the National Ambient Air Quality Standards. Re-permitting may also be voluntarily requested by the facility.

The department is not recommending that oxides of nitrogen (NOx) and sulfur dioxide (SO2) be considered as a trigger for additional permit application review for PM2.5 for non-PSD projects. Although the PSD program includes emissions increases of NOx and SO2 to trigger additional permitting review, the department does not plan to apply this methodology to non-PSD projects.

The Department disagrees with the workgroup's recommendation to continue using larger particulate matter (PM10) as a surrogate for PM2.5 in permitting actions. The Department believes the continued use of PM10 as a surrogate for regulating PM2.5 is not protective of public health. The department does not plan to continue use of the PM10 surrogate policy for non-PSD projects after January 1, 2012. Instead, the department will proceed with permitting for PM2.5 and updating the PM2.5 modeling guidance for non-PSD air construction permit

application projects to include thresholds that would trigger an ambient air impact analysis for PM2.5.

EPA previously allowed states to utilize existing permitting and regulations of PM10 in lieu of specific PM2.5 requirements. EPA has since established adequate implementation tools and guidelines necessary to allow states to implement PM2.5 requirements directly. Using PM10 as a surrogate for PM2.5 does not logically provide adequate protection of public health. The PM10 standard allows up to 150 micrograms per cubic meter; whereas the PM2.5 standard only allows up to 35 micrograms per cubic meter. Putting aside differences in the calculation methods, most combustion sources and many other sources of emissions would greatly exceed the PM2.5 standard if it were only regulated for PM10. Now that EPA has finalized implementation tools necessary to better characterize PM2.5 emissions, the surrogate policy is no longer a reasonable method for permitting sources of PM2.5 emissions.

2.1.1 Evaluate the permits by rule (567 IAC Chapter 22) with stakeholder input and conduct a rulemaking as needed to add provisions that are protective of the PM2.5 standard.

Spray booths which comply with the requirements contained in 567 IAC 22.8 are not required to obtain an air construction permit. These requirements include restrictions on the number of gallons sprayed daily, recordkeeping requirements, and a minimum stack height requirement. Provisions within the rule that limit the number of gallons sprayed on a daily basis are considered to be federally enforceable limits which prevents applicable spray booths from being subject to major source permitting requirements.

The provisions included in the permit by rule for spray booths may not be protective of the PM2.5 standard. The department, in concurrence with the workgroup recommendation, will meet with affected stakeholders and their representatives to review these provisions. Modifications will be based upon techniques acceptable to affected stakeholders and will be consistent with state rules for protecting air quality. Due to implementation of a recent federal regulation, extensive outreach has been conducted to the source sectors which primarily use this rule (paint booths and auto body shops). The department will use these contacts to provide updates and disseminate information. This review and any changes to the permit by rule will be completed by January 1, 2011.

Spray booths currently covered under the existing permit by rule will continue to be covered under the existing permit by rule. It is unknown at this time whether any new or modified permit by rule provisions will include a grandfathering clause for spray booths covered under the existing permit by rule.

Necessary Administrative Actions

If any changes to the permit by rule are necessary, the department will complete an administrative rulemaking by January 1, 2011. Additional resources and staff will not be necessary to evaluate and update as necessary the permits by rule.

2.1.2 Evaluate with stakeholders construction permitting general templates that are still in use, and include provisions as necessary that are protective of the PM2.5 standard.

The department has developed general templates to be used in place of standard construction permit application forms for aggregate processing plants, concrete batch plants, bulk gasoline plants, and country grain elevators. Templates for country grain elevators include a Group 1 registration form and a Group 2 permit template.

The department had also created a general template for portable asphalt plants but has discontinued use of this general template for new portable asphalt facilities after identification of conditions in the general template that would have allowed some sources to inadvertently become subject to more stringent federal permitting requirements. There are numerous existing portable asphalt facilities which are still covered under this general template.

Use of the templates streamlines and speeds up the permitting process for both the department and facility owners and operators of qualifying facilities who are willing and able to operate their plants in conformance with the conditions contained in these templates. Owners and operators of one of these facility types with equipment that can meet the preset operating conditions contained in the applicable general template may complete and submit the applicable template instead of the standard construction permit application. The preset operating conditions limit equipment operating capacities, operating hours, and configurations based on previously completed ambient air impact evaluations.

The provisions included in the general templates may not be protective of the PM2.5 standard. The workgroup recommended that the general permits be evaluated by applicable stakeholders and modified to add PM2.5 thresholds based upon techniques acceptable to affected stakeholders (E2).

Sources covered under an existing permitting template will be able to continue to be covered under a permitting template until such time as a modification is made at the facility that would require the facility owner or operator to evaluate whether they can use a new permitting template (if available) or obtain an air construction permit(s).

Necessary Administrative Actions
The department will participate in a review of the general templates with stakeholders and will evaluate and modify as necessary permitting templates that are still in use to include provisions for PM2.5, if affected sources believe that the templates are still useful.

Budget Request and Needed Resources
A timeframe has not yet been established for conducting this review. Given the amount of staff time required to develop the original general templates, and the on-going support necessary to review submittals from applicants who chose to use the general templates, the department is requesting one FTE ($75,000) to perform activities related to this recommendation.

2.1.3 Modify construction permitting forms EC, EI and MI2 to add a column for PM2.5 emissions.

The workgroup identified only three forms that needed to be updated to include PM2.5. These were the Form EC (Emissions Calculations), Form EI (Emission Inventory), and Form MI2 (Modeling Information- Source Parameters). Each of these forms will need to have a column added for PM2.5 emissions.

Necessary Administrative Actions
The department plans to have updated air construction permit application forms that include these revisions available by April 1, 2011. No additional resources or staffing will be needed to revise the forms.

2.1.4 Update the ambient air impact analysis guidance with stakeholder input to include provisions for PM2.5.

Completion of an ambient air impact analysis is a crucial step in the air construction permit application engineering review process. Ambient air impact analysis and decisions on allowable emission rates establish whether there are adequate clean air resources available for a new project before the project is built. The National Ambient Air Quality Standards (NAAQS) define levels of air quality that have been determined to be necessary to protect public health and welfare from any known or anticipated adverse effects of a pollutant. Ambient air impact analyses are conducted by the department to determine whether the proposed emission limits, controls, and operating conditions for a project will be sufficient to prevent violations of the NAAQS if the project is allowed to be constructed and operated. The department must ensure that the expected emissions from a proposed source or modification, in conjunction with all other emissions, will not prevent the attainment or maintenance of the ambient air quality standards (567 IAC 22.3(1)“b”). If new projects are allowed to be constructed without this analysis, then future projects may be put in jeopardy if ambient air quality standards have been violated.

Ambient air impact assessments are required under the federal clean air act to assure that the NAAQS are not violated. This requirement is also federally enforceable through Iowa’s federally approved State Implementation Plan (SIP). This requirement is normally accomplished through a combination of consideration of whether an emission unit is exempt from permitting requirements, application of a modeling determination flowchart, and use of an air dispersion model as necessary.

The workgroup stated that, should EPA finalize stack-testing methods for PM2.5, another workgroup should be convened to discuss future PM2.5 modeling policy. EPA revised two test methods for measuring particulate matter emissions from stationary sources on December 1, 2010. The workgroup provided some preliminary ideas to the department on changes that could be made to the existing modeling determination process flow chart that is used to determine which projects will be evaluated for ambient air impacts. The department used the information provided by the workgroup as starting point to make revisions to the existing process to include factors for determining what evaluations of PM2.5 impacts may be needed during the permit application review process. The department will consult with stakeholders to obtain input on the proposed changes to the process before finalizing the revised process.

Application of Dispersion Modeling Tools
Air dispersion modeling tools are typically applied to complete an ambient air impact analysis. Air dispersion modeling analyses are used to predict ground level ambient air concentrations of pollutants and compare those levels to ambient air quality standards. Air dispersion modeling allows the impacts of the pollution from a proposed air pollution source to be determined before a source is constructed or modified. The air dispersion modeling is conducted with an EPA approved model that uses mathematical formulations and information about the source emissions along with the local terrain and meteorological data to predict pollutant concentrations at locations selected by the user.

Air dispersion modeling is usually conducted by the department for most air construction permitting projects requiring modeling; however modeling may be submitted by applicants or their consultants for department review, depending on the complexity of the analysis. In either case, the modeling is accomplished in accordance with Department's modeling guidelines and with Appendix W of 40 CFR Part 51.

Determination of Need to Conduct Dispersion Modeling
Air construction permit applications submitted to the department fall into two general categories: projects that fall under the federal Prevention of Significant Deterioration (PSD) program and smaller, non-PSD projects.

PSD projects are large projects for new facilities that will emit more than 250 tons per year of a pollutant (or more than 100 tons per year for some select types of facilities) or for major modifications at these existing large facilities. A major modification at one of these large facilities would be a project that has the potential to increase emissions by more than 40 tons per year of sulfur dioxides (SO2), oxides of nitrogen (NOx), or 10 tons per year of PM2.5 emissions. The modeling requirements for these types of projects are federal and therefore were beyond the scope of the workgroup.

Non-PSD projects can be either projects at smaller facilities (those that emit less than 250 tons per year of a pollutant (or less than 100 tons per year for some select types of facilities)) or can be for smaller projects (projects that emit less than the major modification thresholds listed above) at larger facilities. PM2.5 modeling guidance for non-PSD projects is the subject of this recommendation.

The department has several modeling guidance documents available to assist applicants in determining which projects will require a non-PSD modeling review and how the modeling will be conducted, should it be required. The department's modeling guidance document generally exempts emission units from dispersion modeling that are exempt from permitting requirements. These emission units include sources covered under the small unit exemption (567 IAC subrule 22.1(2)"w"), fugitive emissions from sources such as haul roads and material piles, and emission units like emergency generators and fire pumps that are typically only used when the rest of the facility is not in operation.

In addition to the exemptions for sources described above, the department uses a modeling determination flow chart to further refine what types of projects should undergo an air quality impact assessment. This flow chart provides a transparent and consistent method for determining which projects require a dispersion modeling analysis. It allows applicants to make

decisions regarding stack configurations and emission rates so that their construction permit project may opt out of the requirement to conduct a modeling review. Using the flow chart as a tool to determine which projects require a modeling analysis over the last three fiscal years (July 2007 through June 2010) resulted in only 21% of the 1,632 non-PSD construction permit projects being modeled.

The vast majority of construction permit applications do not require a modeling analysis to receive a construction permit. The flow chart is designed to identify only the projects that are most likely to result in predicted concentrations that threaten the NAAQS. In other words only projects with relatively high emission rates or with stack configurations or emission point locations that are known to be problematic are modeled. Even when a dispersion modeling review identifies predicted concentrations that exceed the NAAQS, the department works with the applicant to resolve any predicted exceedances and it is rare for a project to be rejected due to modeling. For the period October 1 2009, through October 2010, 37% of the non-PSD projects modeled, or 38 out of 103 projects, required mitigation by the department to assure that predicted concentrations were below the applicable NAAQS. Only two non-PSD projects modeled by the department during this period were rejected due to incomplete facility wide modeling analyses Both of these projects were later approved after being resubmitted with updates by the applicants

The modeling determination flow chart lists various criteria such as if the emission units in the project have been modeled previously, whether past modeling analyses had identified problems, the proposed emissions increase, the type of discharge (vertical unobstructed, horizontal, downward or capped), the height of the stacks above nearby buildings and the distance of the stacks to the facility's property boundary. All of these criteria have an effect on the likelihood that a project could cause predicted exceedances of the NAAQS.

Necessary Administrative Actions

Proposed Modeling Determination Flow Chart Revisions

The revised modeling determination flow chart includes an emissions threshold for PM2.5 (Appendix D). The flow chart is based on our current modeling determination flow chart for other pollutants and on the flow chart developed by the subcommittee and presented to the workgroup on October 7, 2010. The new flow chart incorporates the same 9.4 ton per year PM2.5 threshold in combination with other criteria, as was proposed by the subcommittee on October 7, 2010. The reference to the small unit exemption screening threshold found in the flow chart developed by the subcommittee has been moved to a more appropriate location in the department's proposed flow chart.

The only substantial difference between what had been proposed by the subcommittee and what the department is proposing with the revised modeling determination flow chart is in regard to the values for stack height relative to building height and the distances to the facility's property boundary. These values had been left as "to be determined" in the flow chart proposed by the subcommittee and in the department's version these values are those that are used in the current department flow chart for other pollutants. These values are reasonable for other pollutants and therefore maintain a similar level of review for PM2.5 emissions as for other pollutants.

Proposed Updates to Other Modeling Guidance
In addition to the modeling determination flow chart, the modeling guidance document for non-PSD projects, the modeling checklist, and one modeling tool will need to be updated for PM2.5 emissions. The current versions of the guidance document and checklist were developed by a modeling stakeholder workgroup in 2007. The modeling guidance document establishes how dispersion modeling analyses, whether conducted by the department or by the applicant, are conducted. The checklist supplements the modeling guidance document and aids applicants in assuring that all elements in a modeling analysis are addressed and helps the applicant avoid common errors. The modeling guidance document will need to be updated to include the new modeling determination flow chart and values related to PM2.5, such as the NAAQS, significant impact levels, small unit thresholds, and background values. The checklist will need to be revised to include PM2.5 in the list of possible pollutants being evaluated.

The volume source tool is a simple spreadsheet that can be used to determine the modeling inputs for sources that primarily vent inside of a building. Departmental practice has been to allow a building enclosure credit to be applied to PM10 emissions released inside of a primarily enclosed structure. Since this practice is not appropriate for PM2.5 emissions, the directions for the volume source tool will need to be updated to indicate that a building enclosure credit is not applicable for PM2.5 emissions.

EPA is in the process of reviewing the current modeling guidance for PM2.5. The department anticipates that this review will be completed and the PM2.5 modeling guidance (and associated model output code) will be updated to incorporate revised procedures for more accurately accounting for background levels (contributions from sources not included in the model that impact the area being evaluated) in the dispersion modeling analyses before non-PSD modeling requirements become effective on January 1, 2012. It is expected that the overall effect of these updates will be to lower the predicted PM2.5 impacts from the levels generated using the current EPA PM2.5 modeling guidance. These updates will also need to be incorporated into the department's modeling guidance document.

The department does not anticipate that implementation of the revised modeling determination flow chart and guidance or conducting any resulting air dispersion modeling, will require additional staff or resources. As noted above, the department will consult with stakeholders to obtain input on the proposed changes to the process before finalizing the revised flow chart and modeling guidance.

2.2: Steps to ease the regulatory burden of PM2.5 implementation.

2.2.1 Complete rulemaking to modify current exemptions from construction permitting (567 IAC Chapter 22) to add thresholds for PM2.5 as recommended by the workgroup.

The department allows sources and processes that have very low and infrequent actual emissions of regulated air pollutants and that have little or no environmental or human health consequences to be exempted from the requirement to obtain an air construction permit. Sources and processes that have been exempted from this requirement are listed in 567 IAC 22.1(2). Exempting small sources and processes of air emissions eases the regulatory burden on regulated businesses and industry and allows the department to focus its limited resources

on air emissions from sources and processes that typically have a greater impact on ambient air quality.

All current exemptions from the air construction permitting requirements were reviewed to determine which exemptions needed to be modified, added, or deleted for PM2.5. This review resulted in the workgroup recommendation to modify three exemptions to include consideration of PM2.5. The exemptions were the small unit exemption, production welding, and equipment related to research and development activities (567 IAC 22.1(2)"w," "ff," and "kk," respectively). The department assisted in the technical review of the exemptions and evaluated the predicted ambient impacts of the exemption modifications using methodologies previously approved by EPA.

Necessary Administrative Actions
The department will complete the necessary rulemaking to update these exemptions in 567 IAC Chapter 22. This rulemaking will begin in February 2011. No additional staff or resources will be needed to complete this action.

2.2.2 Complete rulemaking to adopt PM2.5 test methods and obtain stakeholder input regarding implementation of the test methods.

Emissions testing, also referred to as a stack test, measures the amount of a specific pollutant being emitted from stacks at industrial sources. Stack testing is an important tool used by the department to verify that a facility's emissions do not exceed levels established in regulations or permits. Testing is also used to set operating parameters for the source and evaluate air pollution control equipment performance.

There are a number of factors used to determine if emissions testing will be required on a new, modified, or existing source of pollution. Some examples include the quality of the emission estimate provided in a pre-construction permit application, the reason the permit limit was established, how close the actual emissions are expected to be to that limit, and observations made during facility inspections. The stack testing process requires special equipment and expertise in sampling methods. Facility owners or operators usually hire testing firms to conduct the testing and report the results to the department. State and federal testing methods must be followed to obtain a valid result. Department staff goes to facilities to observe and audit many of the tests to ensure approved methods are followed.

Testing procedures vary depending on the pollutant being measured. In most cases air samples are collected at a location in the stack and then analyzed at a laboratory to determine pollutant concentrations. Test reports submitted to the department are reviewed by department staff to validate the reported results. The results are then compared to the emission limits in permits to determine compliance with the emissions limits specified in the air construction permit and applicable state rules. The emissions test data are then entered in a database so they are available to other department program areas for air quality decision making and planning.

Necessary Administrative Actions
On December 1, 2010, EPA revised two test methods for measuring particulate matter emissions from stationary sources. The methods will become effective on January 1, 2011. The department will adopt these methods through a rulemaking that will be initiated in February

2011. Input from affected stakeholders regarding implementation of the test methods was requested via the department's List Serve on December 13, 2010. Any changes needed to the Compliance Sampling Manual, which is adopted by reference in 567 IAC Chapter 25, to implement the new test methods will also be included in this rulemaking.

Budget Request and Needed Resources
It is anticipated that there will many stack tests required to verify PM2.5 emission limits placed in air construction permits until knowledge and confidence regarding PM2.5 emission rates for different source categories improves. This will necessitate the need for additional stack test observations by the department. The department is requesting one new FTE ($75,000) to support PM2.5 stack test observations.

2.2.3 Make PM2.5 emission test data publicly accessible.

Source specific emissions testing is one of the best methods available to generate quality emissions data. PM2.5 emission data generated from the recently promulgated EPA test methods will not only be useful to the department in air quality decision making and planning but will also be extremely useful to the public. Test results can be viewed to identify emission rates that can be substituted for like emissions units that are being permitting, possibly negating the need to conduct expensive testing. These data could also be used in air quality computer models to estimate a source's impact on the NAAQS, and to estimate a source's annual emissions for emissions inventory reporting.

EPA is urging states through the National Association of Clean Air Agencies (NACCA) to develop a national stack test database. Progress is slow however as the electronic reporting tools that EPA would like the states to implement are in need of several improvements to make them more user friendly. The department will monitor the activities in this area and keep stakeholders updated on any progress related to this action.

Budget Request and Needed Resources
The department currently collects emissions data in a database that could be accessed via the Internet. This information has been shared with workgroup participants who recommended the information be made publically accessible. It is estimated that three to six months would be needed for a contractor to provide public Internet access to the database, at an estimated cost of $40,000 - $80,000. If these resources cannot be provided, then a possible compromise would be for the department to provide a spreadsheet on the website that contains representative PM2.5 emissions test data for various source categories. The spreadsheet could be updated periodically by the department to ensure that the latest approved test data is available to the public.

2.2.4 Focus on compliance assistance activities prior to taking enforcement actions until representative emission factors are available.

The objective of the department's compliance and enforcement activities is to ensure that industry, businesses, institutions, and individuals are in compliance with state and federal air quality regulations. Compliance is promoted through effective permits, compliance assistance, and appropriate enforcement actions when violations occur.

The department provides compliance assistance and guidance to the regulated community to encourage source owners and operators to comply with applicable regulations. Staff provide compliance assistance in the form of environmental conference presentations, workshops, mass mailings, telephone consultation, and on-site visits. Information is also developed for the department website, such as fact sheets, forms, technical guidance documents, and links to air quality regulations. Staff also works with specific industry sectors and associations to assist with implementing new regulations.

Because EPA recently established a method for measuring emissions of PM2.5 there remains uncertainty surrounding the quantification of PM2.5 emissions. Inaccurate estimation of a PM2.5 emission rate could lead to an inability to demonstrate through stack testing that an emission unit is meeting a permitted PM2.5 emission limit. To alleviate this concern, the workgroup recommended that the department focus on compliance assistance activities prior to taking enforcement actions until representative emission factors are available. The department will focus on compliance assistance as both the department and industry gather more information and knowledge about PM2.5 emissions from different source categories and processes while the PM2.5 standard is implemented. Compliance assistance will be provided using the applicable approaches described above. Compliance assistance efforts will not preclude the department from protecting public health or the environment.

Budget Request and Needed Resources

The department requests one new FTE ($75,000) to provide PM2.5 specific compliance assistance in the form of presentations, workshops, telephone consultation, and on-site visits. The FTE will also work with specific industry sectors and associations to assist with implementing PM2.5 regulations.

.

2.2.5 Collaborate with stakeholders to effectively implement new federal regulations that reduce emissions of direct PM2.5 and PM2.5 precursors.

Air pollutants such as PM2.5 and the precursor pollutants which contribute to PM2.5 are capable of being transported over long distances, many hundreds of miles and further. Federal programs that reduce PM2.5 or precursor emissions in areas surrounding Iowa will help to reduce local pollutant concentrations. There are a number of federal measures either recently finalized, proposed, or pending development that will likely help reduce PM2.5 concentrations in Iowa. A wide variety of sources and source categories (such as power plants and other industrial sources, motor vehicles, stationary engines, nonroad diesel engines, lawn equipment, and gas stations) have or are expected to reduce emissions under the compliance obligations associated with these federal actions. However, these reductions will likely not impact most existing sources of PM2.5, nor prevent new projects from having the potential to cause violations of the NAAQS and cannot substitute for air construction permit application review.

Necessary Administrative Actions

As federal rules are finalized the department will coordinate outreach efforts with affected stakeholders to ensure timely communication and discussion of rule requirements and options. No additional resources or staff will be necessary to complete this action.

3. Recommendations for the Agricultural sector that will reduce PM2.5

3.1: Expand the educational & outreach efforts to the agricultural community on best practices to reduce ammonia emissions from livestock operations and excess nitrogen application.

Gaseous ammonia forms a basic solution (pH >7.0) when dissolved in water. Ammonium (NH_4^+) is a fine particulate aerosol that is formed by the reaction of ammonia gas with sulfur, nitrogen, and other acidic species forming ammonium sulfate and ammonium nitrate fine particulate matter. These aerosols, along with carbon aerosol, constitute the major fraction of $PM_{2.5}$ pollution found in Iowa's ambient air not impacted by direct emissions from industrial or energy facilities.

PM2.5 levels are often elevated, sometimes for a period of several days, in Iowa during the winter months. Multiple exceedances of the PM2.5 standard often occur over wide areas of the state and the upper Midwest during these wintertime PM2.5 events. As documented in the recommendations of the Area Sources subcommittee of the workgroup, cold weather PM2.5 episodes contain ammonium nitrate, generated by the combination of nitric acid (from oxides of nitrogen) and ammonia in the atmosphere. Under meteorological conditions where there is low wind, cold moist weather and temperatures between 20 and 40 degrees Fahrenheit, the reaction of ammonia and nitric acid forms ammonium nitrate PM2.5. The amount of ammonium nitrate produced is limited by the pollutant with the lowest (molar) concentration.

Dr. Charles Stanier's presentation (assistant professor at the University of Iowa in Chemical and Biochemical Engineering) "On the LADCO Winter Nitrate Study Findings" reports that, contrary to prior assumptions, it appears that fine particle nitrate formation in rural areas may be ammonia limited during some episodes, rather nitric acid limited.. That is, ammonia occurs at sufficiently low concentrations that it restricts secondary (ammonium nitrate) PM2.5 formation. This means that reductions in ammonia could reduce the formation of ammonium nitrate PM2.5. The presentation was based on ongoing work that is now final, and is available at http://www.ladco.org/reports/rpo/monitoring/FINAL_IOWA_phase_1_report_nov11.pdf.

Iowa is located in a large area of ammonia emissions centered on the upper Midwest (Figure 3.1). EPA emission estimates from the 2005 National Emissions Inventory (NEI, http://www.epa.gov/ttn/chief/eiinformation.html) indicate that 98 percent of all ammonia emissions in Iowa are emitted from non-point sources. Recall from section 2.0 that the term "non-point source" is an emissions inventory classification that includes aggregates of emissions of smaller stationary sources, and can include smaller point sources.

Sources of ammonia emissions include agricultural production, industrial, commercial, and residential fuel combustion, industrial processing, petroleum and petroleum product transport, and waste disposal. Ammonia emissions are highest from agricultural production, approaching 250,000 tons, or more than 95 percent of the total non-point source sector ammonia emissions, in 2005. Fertilizer application and swine production lead in ammonia emissions within the agricultural production category (Figure 3.2). The animal husbandry processes listed in Figure 3.2 include confinement, manure handling & storage, and land application of manure. The ammonia emissions from the land application of manure for each animal type is separate from

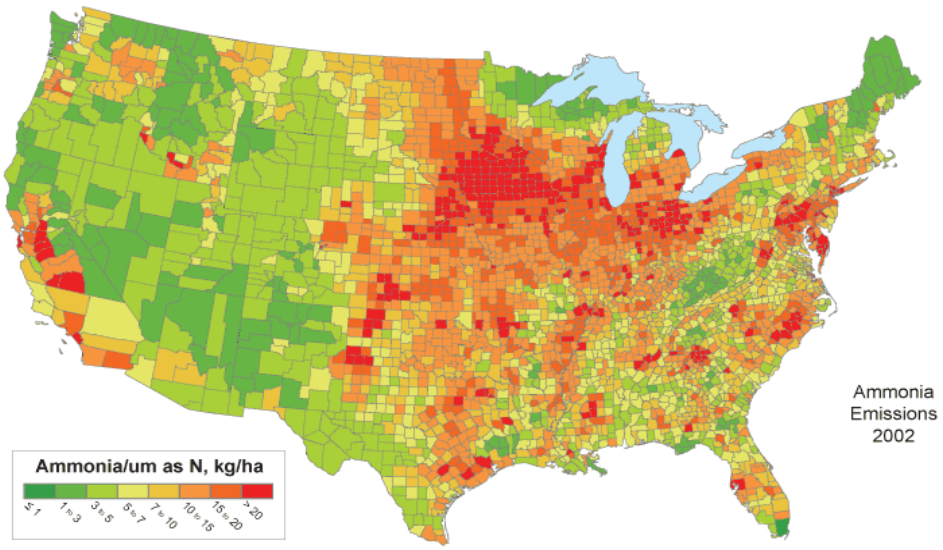


Figure 3.1: Ammonia emissions from all sources, 2002.
(Source: http://nadp.sws.uiuc.edu/nh3net/)

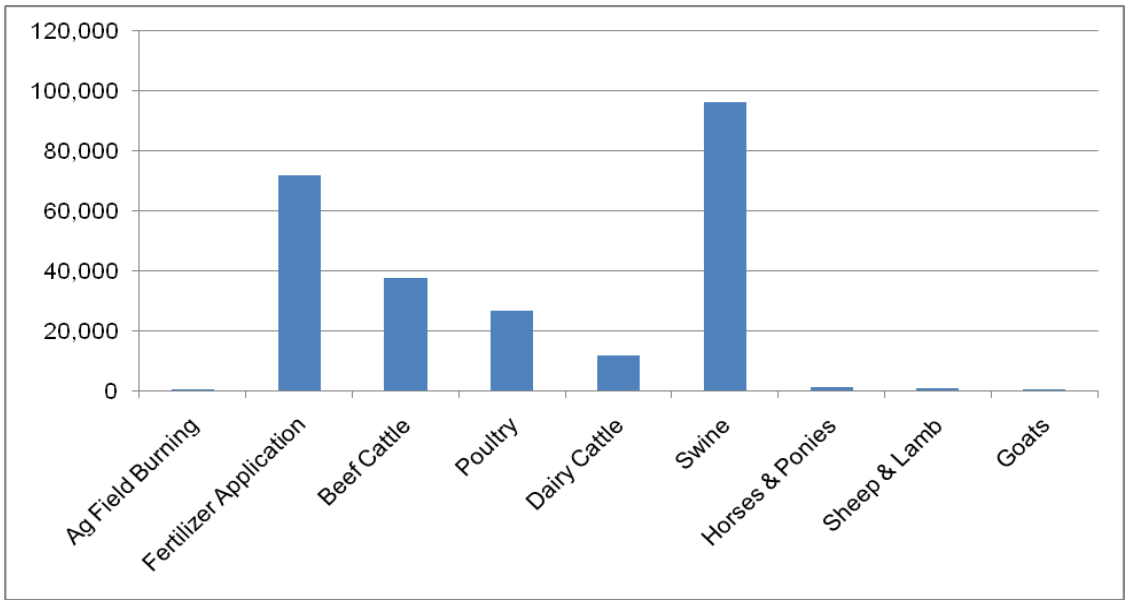


Figure 3.2: Ammonia emissions (tons) from agricultural production processes in Iowa (Source: EPA 2005 NEI).

the fertilizer application bar. In other words, ammonia emissions from the land application of manure and fertilizer application have not been double counted.

EPA recently completed the National Air Emissions Monitoring study (NAEM study) for animal feeding operations. The sites selected for monitoring represented major animal groups (*i.e.*, swine, dairy, and poultry (broilers and layers), different types of operations, and different geographic regions, including Iowa. Pollutant monitoring focused on emissions from the animal housing and manure storage facilities and included ammonia, particulate matter, volatile organic compounds, and hydrogen sulfide.

The monitoring phase of the study has been completed. By November 2011 EPA anticipates publishing emission-estimating methodologies. This information will be used to determine the applicability of provisions of the Clean Air Act, Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), and Emergency Planning and Community Right-to-Know Act ("EPCRA") to various livestock operations. Implementation of the resulting methodologies will also promote a uniform national approach to estimating emissions from animal feeding operations.

It was a majority recommendation of the workgroup that Iowa should not move ahead of the EPA in developing regulations on air emissions from animal feeding operations. The NAEM study results have been submitted to EPA and EPA may develop additional regulations based on the emissions methodologies being developed.

Necessary Administrative Actions

The department will defer consideration of state level regulations for both precursor ammonia emissions and direct particulate matter emissions from agricultural operations until EPA has developed their emissions factors, modeling, sampling protocols and resulting regulations.

In the mean time, consistent with workgroup recommendations and recommendations from Dr. Charles Stanier, professor at the University of Iowa in Chemical and Biochemical Engineering, the department recommends expanded education and outreach activities to the agricultural community on best practices to reduce ammonia emissions from livestock operations and excess nitrogen application. Much information and tools regarding best management practices for these areas is already available through the department's website (http://www.iowadnr.gov/air/afo/afo.html) and the Iowa State University Extension website (http://www.extension.iastate.edu/airquality/pubs.html). The department will take steps to make this information more accessible and known to the agricultural community through renewed collaboration with agricultural business and trade organizations and associations. The department will also support continued research and voluntary adoption of air pollutant mitigation strategies, including on-farm research, to develop or refine as appropriate the efficacy and protocols for air pollutant mitigation strategies.

Options for expanded education and outreach could include new or updated publications, workshops, demonstration sites, and assistance with facility owner/operator self assessments. The department would engage Iowa State University's Department of Agricultural and Biosystems Engineering along with the ISU Extension to develop and provide expanded education and outreach resources to the agricultural sector, including investigating opportunities

to build on education and outreach that already occurs in other program areas, such as Manure Applicator training.

Budget Request and Needed Resources
The department currently has one quarter of one FTE in the Air Quality Bureau who is devoted to tracking and providing information on air quality issues related to the agricultural sector. Given the desire for expanded education and outreach to the agricultural sector and the likely promulgation of federal regulations in the next two to three years that will impact the regulation of animal feeding operations, the department is requesting funding for a full FTE ($75,000) in this area. This FTE would be devoted to expanding education and outreach to the agricultural community on best management practices to reduce air pollutant emissions of PM2.5 and PM2.5 precursors and conducting planning activities related to the implementation of future federal air quality regulations that may impact animal feeding operations in Iowa.

3.2: Fund the Iowa State University Extension to update the publication "Practices to Reduce Ammonia Emissions from Livestock Operations" to reflect ammonia's impact on PM2.5 concentrations.

The department concurs with the workgroup recommendation to update the ISU Extension publication "Practices to Reduce Ammonia Emissions from Livestock Operations" and the associated flowchart. This publication appears to currently be dated July 2004 and the associated flowchart is dated January 2005. Updates should include the latest practices and techniques for reducing ammonia emissions, the associated costs, and the addition of information that explains the role of ammonia in PM2.5 formation and the resulting impacts on air quality.

The department recommends that the Governor and Iowa General Assembly provide sufficient funds to update, publish, and distribute the publication.

4. Recommendations for the Transportation sector that will reduce PM2.5

4.1: Review and participate in studies of primary and secondary PM2.5 and precursor emissions from on-road sources.

Automobiles are vital to our economy and daily life but are also responsible for generating significant quantities of emissions of PM2.5 and its precursors. The department agrees with the workgroup recommendation that more information is needed to fully understand vehicle or mobile source contributions and how these contributions vary by location and time period.

Emissions of nitrogen oxides and volatile organic compounds (VOCs) from mobile sources react in the atmosphere to form fine particulate matter. Refining both the emissions estimates from on-road sources and the conditions or mechanisms which convert precursors to PM2.5 can lead to improved air quality planning.

Necessary Administrative Steps
Progress in these areas can be made through participation and review of studies of primary and secondary PM2.5 and precursor emissions from on-road sources.

Budget Request and Needed Resources
Additional resource and staffing needs for this action are combined with the resource and staffing needs in recommendation 4.2.

4.2: Increase collaboration and air quality knowledge transfer with other state and local agencies and MPO staff in transportation planning activities.

In the absence of internal capabilities there exists a reliance upon data and conclusions developed externally. The department believes that emissions of PM2.5 precursors from the transportation sector (on-road sources) play a significant role in terms of contributions made to ambient PM2.5 levels. On-road sources include light duty gasoline and diesel vehicles and heavy duty gasoline and diesel vehicles.

This assessment is based largely upon external data, for example, the on-road source emissions data developed by EPA. The most recent information available regarding on-road emission estimates from on-road sources in Iowa comes from EPA. According to EPA's 2008 national emissions inventory (NEI) data, direct emissions of fine particulate matter from on-road sources is approximately one tenth of that from point sources. In contrast, emissions of the PM2.5 precursor species of nitrogen oxides (NOx) and volatile organic compounds (VOCs) attributable to on-road sources represent a much larger portion of total anthropogenic emissions. These contributions can be seen in Figure 3.3. On-road sources are the only category in which over one quarter of both the NOx and VOC emissions are attributable to a single source category. These emissions are expected to be important contributors to PM2.5 concentrations.

Emissions rates are a useful metric to begin an assessment of how sources may contribute to fine particulate matter concentrations, but a level of confidence in the data must first be established before more meaningful conclusions can be researched. As mentioned, the on-road emissions estimates are provided by EPA. EPA's estimates are based upon generalized assumptions and national defaults regarding on-road source activity. The appropriateness of EPA's inventory for Iowa sources in unknown.

To improve the accuracy of the inventory and thus begin to refine the role of on-road emissions to PM2.5 concentrations in Iowa, state-specific emissions data is required. The types and ages of vehicles used in Iowa, driving patterns, and traffic conditions may differ significantly from the default conditions used by EPA. The only means available to minimize this uncertainty and potential error is to engage in the process of developing an on-road emissions inventory utilizing state specific data coupled with mobile source emissions expertise. This will require staff that can focus on developing the necessary expertise to properly assess and improve Iowa's mobile-source inventory. This would be a first step toward improving the understanding of how mobile source emissions contribute to particulate matter concentrations in both rural and urban environments.

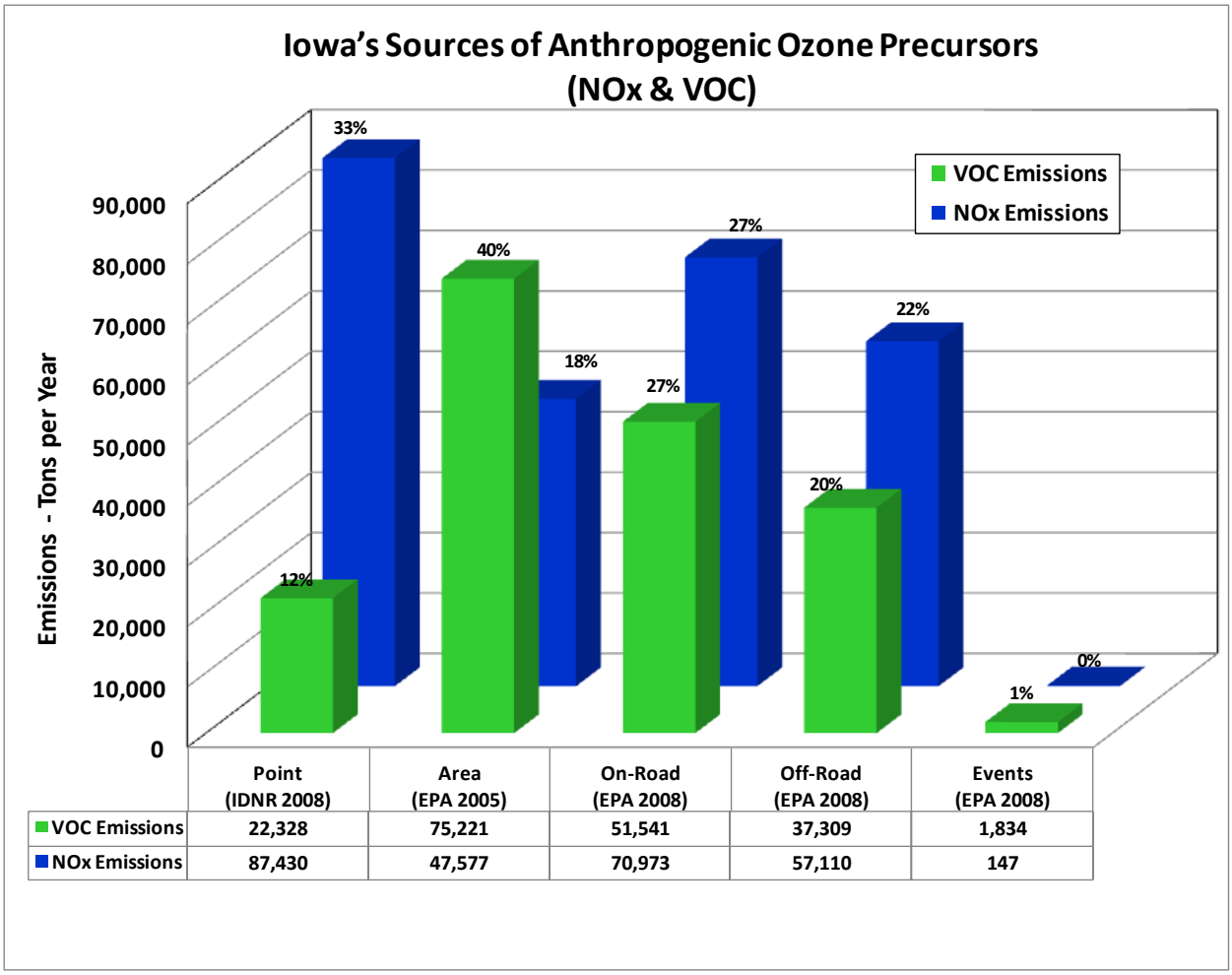


Figure 3.3: Emissions in Iowa from man-made (anthropogenic) sources. The most recent data available is used, which requires using data from different years, as EPA has not updated the area source data from 2005 values. (Events are localized, short-duration, emissions-producing incidents that do not recur or recur irregularly and infrequently, such as prescribed burns.)

Current and historical on-road emissions data developed externally is also used by EPA and downwind air quality planning organizations when assessing how emissions from Iowa may impact pollutant concentrations both in-state and in downwind locations out of state. Errors in these estimates can lead to EPA or other external agencies reaching inappropriate conclusions regarding how emissions in Iowa contribute to downwind pollution concentrations.

Necessary Administrative Actions

The department will increase collaboration and air quality knowledge transfer with other state and local agencies and MPO staff in transportation planning activities.

Budget Request and Needed Resources

The department estimates that one additional FTE ($75,000) devoted to developing expertise related to on-road emissions and transportation activities, would be necessary to complete the administrative actions specified in recommendations 4.1 and 4.2

5. Summary of Financial Support Needs

PM2.5 air pollution is an issue which affects all citizens of the State of Iowa and therefore should be funded by the State who is charged with protecting their health and welfare. A majority recommendation of the workgroup was that the Iowa General Assembly adequately fund the department's Air Quality Bureau to implement the PM2.5 NAAQS. The funding requests and associated FTEs for each of the department recommendations discussed above are summarized below by one-time funding needs and on-going annual funding needs.

Table 1: Summary of Funding Request (One Time)	**Amount**	**FTE**
1.1 Residential Waste Outreach &Education Campaign -Community survey, education and outreach campaign- $350,000 over 2 years -Grants to communities- $1,000,000 over 2 years	$1,350,000	*
1.4 Proper Use of Wood Burners Education & Outreach Campaign -Survey, education & outreach campaign- $150,000 over 2 years	$150,000	*
2.2.3 Public Access to PM2.5 Emission Test Data	$40,000 - $80,000	None

*See Table 2

Table 2: Summary of Funding Request (On-going)	**Amount**	**FTE**
1.1 and 1.4 Residential Waste and Wood Burner Outreach &Education Campaigns and on-going assistance (2 FTEs)	$150,000	2.0
1.2 Ambient Air Monitoring -Equipment operation and maintenance- $450,000 -Two FTEs- $150,000	$600,000	2.0
2.1.2 Review and Update General Permit Templates, On-going Permit Review (1 FTE)	$75,000	1.0
2.2.2 PM2.5 Stack Test Observer (1 FTE)	$75,000	1.0
2.2.4 PM2.5 Compliance Assistance (1 FTE)	$75,000	1.0
3.1 Expand Education & Outreach to Reduce Ammonia Emissions and Conduct Planning Activities (1FTE)	$75,000	1.0
4.1 and 4.2 Transportation Planning and Studies for Air Quality (1 FTE)	$75,000	1.0

APPENDICES

Appendix A: House File 2418

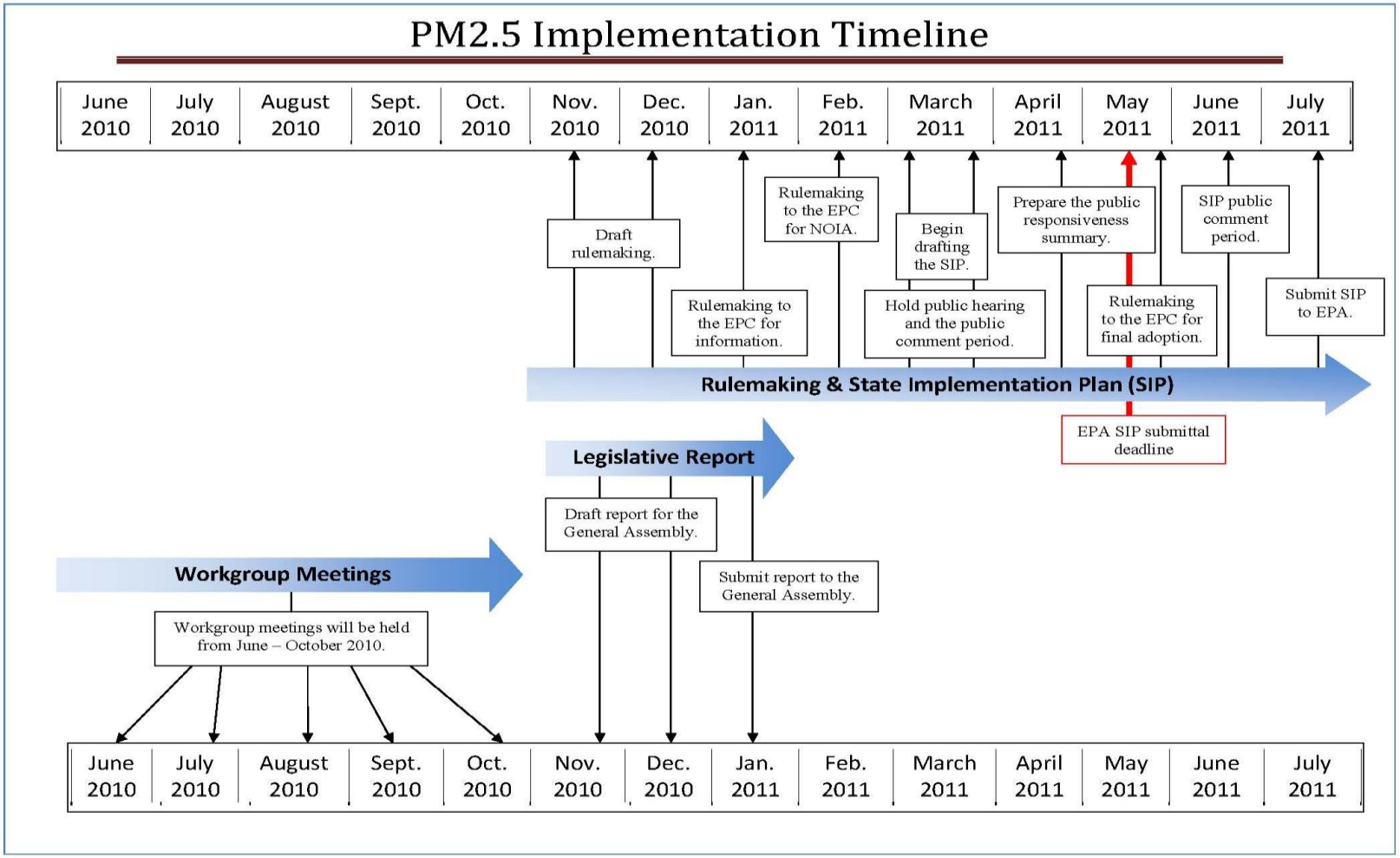
AN ACT RELATING TO PERIODIC EVALUATIONS OF CERTAIN AIR QUALITY STANDARDS.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF IOWA:
Section 1. Section 455B.134, Code 2009, is amended by adding the following new subsection:

NEW SUBSECTION. 14. Convene meetings not later than June 1 during the second calendar year following the adoption of new or revised federal ambient air quality standards by the United States environmental protection agency to review emission limitations or standards relating to the maximum quantities of air contaminants that may be emitted from any air contaminant source as provided in section 455B.133, subsection 4. By November 1 of the same calendar year, the department shall submit a report to the governor and the general assembly regarding recommendations for law changes necessary for the attainment of the new or revised federal standards.

Sec. 2. AIR QUALITY RECOMMENDATIONS.
The department of natural resources shall convene meetings as necessary to develop recommendations for the establishment of state implementation plans sufficient to control the direct emissions of particulate matter with an aerodynamic diameter of less than or equal to two and one=half micrometers and emissions of precursor compounds that contribute to the formation of particulate matter with an aerodynamic diameter of less than or equal to two and one=half micrometers and to prevent ambient concentrations from exceeding the federal ambient air quality standards for particulate matter with an aerodynamic diameter of less than or equal to two and one=half micrometers in all areas of the state. By January 1, 2011, the department shall submit a report with recommendations to the governor and the general assembly. The report shall include recommendations necessary to meet the provisions of this section.

Appendix B: PM2.5 Implementation Timeline



Appendix C: House File 627 and Amendment H-1250

House File 627 - Introduced

HOUSE FILE
BY COMMITTEE ON ENVIRONMENTAL PROTECTION

(SUCCESSOR TO HSB 90)

Passed House, Date _____ Passed Senate, Date
Vote: Ayes _____ Nays _____ Vote: Ayes _____ Nays
Approved

A BILL FOR

1 An Act relating to open burning of residential waste in certain
2 areas of the state and providing penalties.
3 BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF IOWA:
4 TLSB 1245HV 83
5 tm/nh/14

PAG LIN

1 1 Section 1. Section 455B.133, Code 2009, is amended by
1 2 adding the following new subsection:
1 3 NEW SUBSECTION. 11. a. Adopt rules to prohibit the open
1 4 burning of residential waste within any of the following
1 5 areas:
1 6 (1) Beginning January 1, 2010, any city with a population
1 7 of two thousand five hundred or more.
1 8 (2) Beginning January 1, 2011, any city with a population
1 9 of one thousand or more.
1 10 (3) Beginning January 1, 2012, any city with a population
1 11 of five hundred or more.
1 12 (4) Beginning January 1, 2013, any city in the state.
1 13 b. The population of a city as described in this
1 14 subsection shall be based on the most recent federal decennial
1 15 census.
1 16 c. The rules shall allow for conducting prescribed burns
1 17 for purposes of restoring, reconstruction of, or managing
1 18 natural area vegetation such as prairies, grasslands,
1 19 wetlands, woodlands, or wildlife habitat areas.
1 20 d. This subsection shall not apply to the burning of
1 21 landscape waste generated as a result of agricultural
1 22 activities such as the harvesting of crops or raising of
1 23 livestock and also shall not apply to the burning of land
1 24 managed under the federal conservation reserve program under 7
1 25 C.F.R. pt. 1410.
1 26 e. This subsection shall not apply to the open burning of
1 27 natural disaster rubbish caused by a natural disaster for
1 28 which the governor proclaims a disaster emergency pursuant to
1 29 section 29C.6. Natural disaster rubbish includes but is not
1 30 limited to landscape waste and demolished or damaged
1 31 structures.
1 32 f. This subsection shall not apply to supervised open
1 33 burning at a tree and tree trimming burning site operated by a
1 34 political subdivision.
1 35 g. A person who is found in violation of the prohibition

2 1 on burning residential waste under this subsection shall not
2 2 be subject to an enforcement action other than the assessment
2 3 of a civil penalty pursuant to section 455B.109. Criminal
2 4 penalties provided in section 455B.146A shall not apply to
2 5 violations of the provisions of this subsection.
2 6 EXPLANATION
2 7 This bill relates to open burning of residential waste in
2 8 certain areas of the state.
2 9 The bill requires the environmental protection commission
2 10 to adopt administrative rules prohibiting the open burning of
2 11 residential waste in cities. The prohibition begins on
2 12 January 1, 2010, in cities with a population of 2,500 or more;
2 13 on January 1, 2011, in cities with a population of 1,000 or
2 14 more; on January 1, 2012, in cities with a population of 500
2 15 or more; and on January 1, 2013, in all cities in the state.
2 16 The bill provides exceptions to the open burning
2 17 prohibition for residential waste for prescribed burns, the
2 18 burning of landscape waste generated from agricultural
2 19 activities, the burning of natural disaster rubbish, and
2 20 supervised burns at a tree and tree trimming burn site.
2 21 The bill provides that a person who is found in violation
2 22 of the prohibition on burning residential waste shall not be
2 23 subject to an enforcement action other than the assessment of
2 24 a civil penalty. Criminal penalties shall not apply.
2 25 LSB 1245HV 83
2 26 tm/nh/14

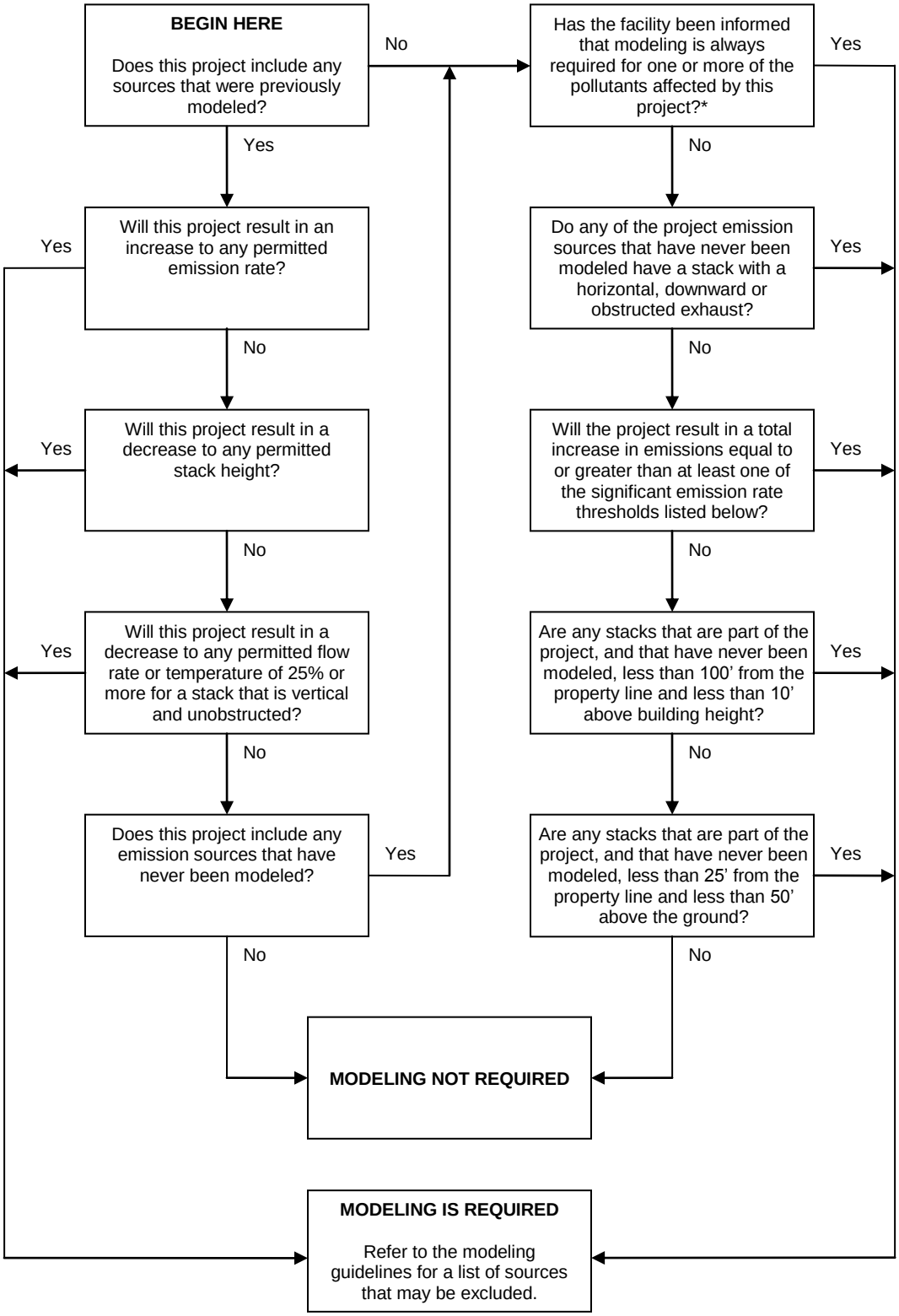
House Amendment 1250

PAG LIN

```
     1  1    Amend House File 627 as follows:
     1  2 #1.  Page 1, line 19, by inserting after the word
     1  3 <areas> the following:  <; managing land under the
     1  4 federal conservation reserve program under 7 C.F.R.
     1  5 pt. 1410; and managing buffer strips, pastures, or
     1  6 field borders>.
     1  7 #2.  Page 1, by striking lines 20 through 25 and
     1  8 inserting the following:
     1  9    <d.  This subsection shall not apply to the burning
     1 10 of landscape waste originating on agricultural land,
     1 11 provided that the burning of trees and tree trimmings
     1 12 occurs at least one=quarter mile from any building
     1 13 inhabited by a person other than the landowner, a
     1 14 tenant, or an employee of the landowner conducting the
     1 15 burning.>
     1 16
     1 17
     1 18
     1 19 SMITH of Marshall
     1 20 HF 627.701 83
     1 21 tm/nh/23153
   1 22
   1 23
   1 24
   1 25
   1 26
   1 27
   1 28
   1 29
   1 30
   1 31
   1 32
   1 33
   1 34
   1 35
   1 36
   1 37
   1 38
   1 39
   1 40
   1 41
   1 42
   1 43
   1 44
   1 45
   1 46
   1 47
   1 48
   1 49
   1 50
```

-1-

Appendix D: Draft Revised Flowchart for Form MD



Appendix D (continued)

Significant Emission Rate Thresholds

PM_{10}	3.29 lb/hr
$PM_{2.5}$	2.15 lb/hr
SO_2	9.00 lb/hr
CO	22.69 lb/hr
NO_X	39.40 ton/yr

Appendix E: Department Summary and Analysis of PM2.5 Implementation Workgroup Recommendations

Department Summary and Analysis of PM2.5 Implementation Workgroup Recommendations

Table of Contents

Section I: Background 2
Section II: Summary of Recommendations and Analysis 3
Section III: Workgroup Recommendations 12
Area Sources Subcommittee Recommendations 12
Emissions Inventory / Stack Testing Subcommittee Recommendations 16
Modeling / Ambient Monitoring Subcommittee Recommendations 20
On the Books/Precursors/Transport Subcommittee Recommendations 23
Permitting Subcommittee Recommendation 26
Policy & Government Relations Subcommittee Recommendations 30
Transportation Subcommittee Recommendations 37
Section IV: Individual and Organizational Comments 40
Appendix I: Workgroup Charter 64
Appendix II: PM2.5 Workgroup Membership and Participating DNR Staff 67
Appendix III: Results from the PM2.5 Brainstorming Session 71
Appendix IV: Subcommittee Instructions and Expectations 81
Appendix V: PM2.5 Modeling Survey Summary 83
Appendix VI: Modeling Test Cases for PM10 as a Surrogate fo PM2.5 88
Appendix VII: Attendance 93

Section I: Background

The Department of Natural Resources (Department) has been concerned about the public health impacts of fine particulate matter, also known as PM2.5. The U.S. Environmental Protection Agency (EPA) created a National Ambient Air Quality Standard (NAAQS) in 1997 for this pollutant in order to protect public health. Federal rules for implementation have been slow to be promulgated. In 2006, EPA increased the stringency of the 24-hour PM2.5 standard based on the latest public health studies and scientific data. Background PM2.5 levels across the state are close to or exceed the NAAQS.

In an effort to better address a wide range of concerns and issues about PM2.5, the Department formed a workgroup to provide input and explore approaches for implementing the standard in Iowa. The Department will submit a plan to EPA by July 2011. The Department has traditionally requested stakeholder input when implementing a new standard. This approach was formalized with House File 2418 which will be codified in Iowa Code 455B.134(14).

The workgroup consisted of approximately 120 members, with representative stakeholder participation from industry/business, trade groups and associations, environmental groups, and local and State agencies.

The workgroup objectives included:

- Review the current regulatory requirements and recommend to the Department any revisions as may be appropriate.
- Advise the Department of program areas, guidance, procedures, and policies that should be updated.
- Identify additional information that is needed to implement the new standard and advise on the approaches and efforts that may be necessary to provide the required information.
- Advise the Department of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for implementing the new standard.

Workgroup members identified approximately 150 issues and concerns related to implementation of the new PM2.5 NAAQS. The issues and concerns were categorized into seven topic areas. Subcommittees were formed to address each topic area. Each identified issue/concern was reviewed by the applicable subcommittee and recommendations on how the Department should address the issue/concern were provided to the workgroup for review and consideration. Approved recommendations from the workgroup were provided to the Department as majority or minority recommendations of the workgroup. The final recommendations from the workgroup are located in Section III.

Section II: Summary of Recommendations and Analysis

The PM2.5 workgroup addressed topics ranging from agricultural issues to residential waste burning. The Department agrees with 88% of the recommendations and disagrees with 12% of the recommendations.

Area Sources

The Department concurs with recommendation A1 on the need for a public education campaign on the proper use of fireplaces, wood stoves, and outdoor wood boilers. Both the Department and the Environmental Protection Commission (EPC) has received numerous air pollution complaints resulting from improper operation of these devices. Limited staff resources have prevented development or dissemination of any Iowa specific information. The Department will continue to provide EPA developed information to the general public and encourage the operation of equipment per EPA and the manufacturers' guidelines.

Recommendation A2 concerned adopting legislation comparable to the intent of House File 627, as amended by H-1250, to prohibit open burning of residential waste within city limits. The Department welcomes new legislation to address open burning within municipalities as a mechanism to help lower background levels of PM2.5. As per the recommendation, stakeholders will be contacted to update the 2006 information on refuse collection, recycling, and composting services available in smaller communities and rural areas.

The Department concurs with recommendation A3 to support the existing Prescribed Fire Policy and to monitor any federal changes on smoke management policies in relation to prescribed fires.

The Department understands the concerns expressed in recommendation A4 to defer the issues of dust from agricultural tillage, harvest related activities, and agricultural equipment. Absent a non-attainment area, the Department does not recommend any control measures at this time. The sources causing or contributing to each nonattainment situation are different, making the solution to bringing any given nonattainment area back into attainment unique. It is unknown what controls could be needed to remedy a future nonattainment situation. Therefore, the Department cannot exclude agricultural dust from possible review in future nonattainment areas.

Recommendation A5 concerns the siting of animal livestock facilities. Currently the Department's Air Quality Bureau does not participate in this process. The recommendation will be shared with pertinent portions with the Department.

The majority of workgroup participants recommended in A6 that Iowa should not develop regulations for air emissions from the livestock industry prior to releasing the National Air Emissions Monitoring (NAEMS) study. The Department does not plan to proceed with regulations at this time. The Department is supportive of education and outreach methods are also in line with recommendation A7 and A8 with voluntary mitigation strategies and updating the publication "Reduce Ammonia Emissions from Livestock Operations".

The workgroup's recommendation A9 to explore NOx and ammonia as PM2.5 precursors is similar to comments made by Dr. Stanier. The Department will continue to collaborate with educational institutions, organizations, and other agencies as resources allow to explore NOx and ammonia as PM2.5 precursors.

Emission Inventory/Stack Testing
Recommendations B1-3 related to emissions testing and emissions inventories. B1 recommended that the Department not do anything regarding PM2.5 emissions testing until EPA promulgates a final method. On December 1, 2010, EPA revised two test methods for measuring particulate matter emissions from stationary sources. The Department will adopt these methods and will seek input from stakeholders regarding implementation of the test methods.

The Department concurs with recommendation B2 and will continue to use the current preferred hierarchy for emission factors provided that it does not conflict with the adoption of the EPA's emissions testing method.

Recommendation B3 requested public access to a Department database that will collect PM2.5 emission test data. Additional funding of $40,000 - $80,000 would be required to provide public access to PM2.5 emission test data. If additional funding is not available, a possible compromise would be for the Department to provide an on-line spreadsheet that contains representative PM2.5 emissions test data for various source categories. The spreadsheet could be updated periodically by the Department to ensure that the latest test data is available to the public.

Modeling/Ambient Air Monitoring
In recommendation C1, the workgroup recommended that to model for PM2.5 for minor source/project permits using the current PM10 modeling guide against the PM10 NAAQS. PM10 should continue to be used as a surrogate pollutant for PM10.

On July 18, 1997, EPA revised the NAAQS for particulate matter to include new annual and 24-hour standards for PM2.5. Later that year, on October 24, 1997, EPA released a memorandum on the interim use of PM10 as a surrogate for PM2.5 in meeting the New Source Review (NSR) requirements. In this memorandum EPA states that PM10 may properly be used as a surrogate for PM2.5 until the difficulties related to PM2.5 monitoring, emissions estimation, and modeling are resolved.

On May 16, 2008, EPA promulgated a rule related to implementation of New Source Review program for PM2.5. This rule included a "grandfathering provision" that allowed states that are delegated to implement the federal PSD program to continue to rely on the surrogate policy provided that the permit application was received by July 15, 2008. The continued use of the PM10 surrogate policy in this rule was challenged and EPA issued a stay that was extended until June 22, 2010 to allow EPA time to formally propose that the "grandfathering provision" be repealed.

On February 11, 2010, EPA published its proposal to repeal the "grandfathering provision" citing that the technical difficulties that necessitated the PM10 surrogate policy had largely been resolved. In this rule making, EPA also proposed that states end the use of the surrogate policy. Even if this proposal did not end the use of the PM10 surrogate policy, the current PSD program for PM2.5 only allows use of the PM10 surrogate policy until May 2011, or the date that EPA approves the state's revised PM2.5 state implementation plan, whichever comes first. It is clear that the intention of the EPA is to do away with the PM10 surrogate policy whether it is addressed under the February 11, 2010 proposal or under the current PSD program provisions.

The Modeling/Ambient Air Monitoring subcommittee conducted a survey to determine what level of review other state and local programs were implementing or planning to implement for PM2.5 modeling. This survey asked a variety of questions such as if the program is conducting, or plans to conduct, minor source PM2.5 modeling, do they have modeling triggers or off ramps, what guidance do they have available for evaluating PM2.5 emissions, what models are being used, how their PM2.5 emission rates are determined, etc. The survey was distributed through the National Association of Clean Air Agencies (NACAA) and the subcommittee received 26 survey responses.

Responses to the survey indicated that approximately one third of the programs were currently conducting modeling of PM2.5 emissions for minor source permitting projects. When asked if the program was planning to conduct modeling of PM2.5 emissions for minor source permitting projects, 65% of the programs indicated that they either were currently modeling for PM2.5, plan to, or may conduct PM2.5 modeling. In programs that have trigger thresholds for requiring PM2.5 modeling, the thresholds range from any increase in emissions to a ten ton per year increase in PM2.5 emissions. Only one state indicated they were developing off ramps for PM2.5 in the form of modeling exemptions. The majority of programs list the American Meteorological Society/EPA Regulatory Model, or AERMOD, as the preferred dispersion model for conducting PM2.5 modeling. Please see Appendix V for additional information on the survey results.

Of particular interest were the responses to the question posed to programs that stated they either were or planned to conduct modeling of PM2.5 emissions for minor source permit projects that asked if the program used PM10 as a surrogate for PM2.5 modeling. Approximately one third of the responses indicated that their programs were using PM10 as a surrogate for PM2.5 modeling. Since the specifics of how PM10 modeling was being used as a surrogate for PM2.5 are important, the subcommittee conducted a follow up survey of these five programs to determine how the evaluations were being conducted.

Although these five programs described slightly different methods for conducting the modeling, all five programs indicated that the modeling results were being compared to the PM2.5 standard and that the modeled PM2.5 emission rates were assumed to be equivalent to the applicant's PM10 emission rates unless better documentation though stack tests or AP-42 emissions factor data was available. One program stated that they conducted modeling of both PM10 emission rates against the PM10 standard and also PM2.5 emission rates against the PM2.5 standard.

The difficulty in comparing model results of PM10 and PM2.5 emissions are complicated because the form of the two standards is different and because EPA guidance on how PM2.5 modeling should be conducted is still evolving. The 24-hour PM10 standard is 150 ug/m^3 (including background) and is attained when the number of exceedances per year is less than or equal to one. Since Appendix W of 40 CFR Part 51 requires that five years of meteorological data be evaluated, for a PM10 modeling analysis this is equivalent to the highest, sixth-high modeled concentration. The 24-hour PM2.5 standard is a statistical standard and is met when the 98th percentile 24-hour concentration is less than 35 ug/m^3 (including background) based on three consecutive years of air quality data. For modeling purposes this is equivalent to the average of the highest, eighth-high modeled concentrations per year, evaluated over the five years of meteorological data.

The differences between the two forms of the 24-hour particulate standards are further complicated by recent EPA PM2.5 modeling guidance. Recent EPA PM2.5 modeling guidance

has stated that "Combining the 98th percentile monitored value with the 98th percentile modeled concentrations for a cumulative impact assessment would result in a value that is below the 98th percentile of the combined cumulative distribution and would therefore not be protective of the NAAQS." The guidance goes on to state that EPA recommends that the average of the first-highest modeled 24-hour impacts over the five years be added to the 98th percentile background concentration for comparison with the PM2.5 NAAQS, which is considerably more conservative. This EPA recommendation was first released in a February 26, 2010 memorandum from Tyler Fox and was re-confirmed in the March 10, 2010 memorandum from Stephen Page. However, this modeling guidance is under review by a workgroup of state and local agency modelers. It is anticipated that recommendations from the workgroup, if accepted by EPA, will lead to revisions to EPA's PM2.5 modeling guidance that could result in new, less conservative approach to determining PM2.5 impacts.

Due to the subcommittee's recommendation to evaluate PM10 emissions as a surrogate for conducting PM2.5 modeling and the Department's concerns about whether or not evaluating PM10 as a surrogate would be protective of the health-based ambient air quality standard for PM2.5, the Department conducted dispersion modeling analyses for several test cases. The results of these analyses are in included in Appendix VI.

Based on consideration of the information discussed above, the Department does not plan to continue use of the PM10 surrogate policy for non-PSD projects after January 1, 2012. Instead, the Department will proceed with updating the PM2.5 modeling guidance for non-PSD air construction permit application projects to include thresholds that would trigger an ambient air impact analysis for PM2.5.

The workgroup stated that should EPA finalize test methods for PM2.5, another workgroup should be convened to discuss future PM2.5 modeling policy (C2). As noted in the discussion for recommendation B1, EPA revised two test methods for measuring particulate matter emissions from stationary sources on December 1, 2010. The workgroup provided some preliminary ideas to the Department on changes that could be made to the existing process that is used to determine which projects will be evaluated for ambient air impacts. The Department will use this information as a starting point and consult with interested stakeholders before finalizing revisions to the existing process to include factors for determining what evaluations of PM2.5 impacts may be needed during the permit application review process.

In recommendation C3 the workgroup recommended that the Department allow businesses to voluntarily install, submit and use independent PM2.5 monitoring results to assess baseline source project impact potential and to demonstrate compliance with the PM2.5 NAAQS. Subject to available resources, the Department will work with any business on monitor siting and development of quality assurance procedures. The business would be responsible for the funding and operation of PM2.5 ambient air monitoring equipment and filter analysis. The ambient air monitoring equipment would have to be operated for a minimum of three years to gather enough data to demonstrate PM2.5 NAAQS compliance.

This approach will only provide information regarding air quality in the vicinity of the facility resulting from existing sources. This approach would not replace the evaluation of possible PM2.5 impacts to ambient air from planned projects since a monitor(s) cannot provide information regarding the potential impacts from planned projects.

OTB/Precursors/Transport

Recommendation D1 was a minority workgroup recommendation regarding ammonia emissions at wastewater treatment plants. Based upon the most recent data available, wastewater treatment plants account for less than 1% of the total NH3 emissions in Iowa. As this represents a small percentage, and NH3 emissions from wastewater treatment plants have not been identified as playing a critical role in PM2.5 formation, the Department does not plan to require ammonia controls on wastewater treatment plants.

The workgroup recommended in D2 that the Department continue to work with stakeholders while developing and implementing proposed and existing federal regulations and use best management practices to reduce PM2.5 precursors. Several recent regulations have been approved and are in the process of being implemented by EPA. Based on the intent and applicability of the new regulations, there should be a positive effect in reducing PM2.5 background levels by reducing direct PM2.5 and PM2.5 precursor emissions. However, it is difficult to determine the extent, magnitude, or timing of this likely positive effect. Also, a given rule may not address all perceived precursors and pollutants, or it may not address all perceived contributing sources of interest. For instance, estimating where and when reductions associated with federal regulations applicable to cars, trucks, semis, construction and agricultural equipment, and other mobile sources will have a positive effect is complicated by estimating where and when older equipment might be retrofitted or replaced with cleaner and more efficient vehicles.

The Department utilizes numerous communication outlets to engage stakeholders and keep them informed of developing federal and state activities. Where federal regulations allow state flexibility, the Department will continue to seek stakeholder input regarding the appropriate methods to implement new federal regulations in a manner consistent with applicable requirements and seek opportunities to engage stakeholders in the implementation of best practices in any situation where it results in efficient reductions of emissions.

Regional modeling methods, as indicated in recommendation D3, should continue to be used in evaluate the impact of forthcoming regulations and scientific developments. The Department agrees that regional modeling techniques are a valuable component in the broader-scale air quality planning process, and will continue to use these resources as appropriate. The complexity and resource requirements associated with regional modeling requires that the regional modeling tools be applied in a manner that addresses the most appropriate questions without duplication. In the context of air quality planning or incorporation of new scientific information, the Department agrees with the recommendation that continued use of regional modeling in air quality planning and air quality improvement processes is an important tool. These tools often offer the best methods available to evaluate how emissions from other states impact Iowa's air quality, as well as assess the impacts of Iowa's emissions on air quality issues in downwind states. Maintaining the ability to properly evaluate interstate transport or conduct regional scale air quality planning exercises is an important capability that can be used to enhance and potentially protect the needs of Iowa's stakeholders.

The workgroup recommend in D4 that the Department collaborate with other state agencies & interested parties to expand the educational & outreach efforts to control ammonia emissions. This recommendation is similar to A8. As mentioned above, the Department supports the implementation of best practices in situations where it results in efficient reductions of emissions.

Permitting

a. Exemptions

All current exemptions from the air construction permitting requirements were reviewed to determine which exemptions needed to be modified, added, or deleted for PM2.5. This review resulted in the workgroup recommendation (E1) to modify three exemptions to include consideration of PM2.5. The exemptions were small unit exemption, production welding, and equipment related to research and development activities (567 IAC 22.1(2)"w," "ff," and "kk," respectively). The Department assisted in the technical review of the exemptions and evaluated the predicted ambient impacts of the exemption modifications using methodologies previously approved by EPA. The Department concurs with this recommendation and will complete the necessary rulemaking to update these exemptions in 567 IAC Chapter 22. This rulemaking will begin in February 2011.

b. Permit By Rule, Permit Templates

The workgroup recommended that current permits by rule [e.g. spray booths] be evaluated by applicable stakeholders and modified to add PM2.5 thresholds based upon techniques acceptable to affected stakeholders (E2). The Department will participate in this review with stakeholders and will evaluate and modify as necessary permitting templates that are still in use to include PM2.5, if affected sources believe that the templates are still useful. Sources covered under an existing permitting template will be able to continue to be covered under a permitting template until such time as a modification is made at the facility that would require the facility owner or operator to evaluate whether they can use a new permitting template (if available) or obtain an air construction permit(s).

c. Applicable Emission Standards

The workgroup recommendation (E3) that PM2.5 limits, such as grains/scf, should not be put into rule. Though the Department does not plan to develop and implement an emissions standard for direct PM2.5 emissions at this time, the Department believes that it would be very helpful for stakeholders to know what is allowable regarding PM2.5 emissions when submitting air construction permit applications. Specifying in rule some minimum level of acceptable direct PM2.5 emissions that applies to all sources or alternatively direct PM2.5 emissions levels that would apply to specified source categories, would establish a minimum level of ambient air protection, thereby greatly reducing the need to evaluate ambient impacts for many permitting projects through the application of an air dispersion model, and establishing a minimum level at which stack testing would generally not be required. Given the workgroup's recommendation that the Department continue to use PM10 as a surrogate for PM2.5 (recommendation C1), investigating the development and implementation of a minimum control level for direct PM2.5 emissions would have greatly aided in narrowing the scope of projects that may have to be evaluated for ambient air impacts in the future.

It should be noted that the current state wide particulate matter emission limit of 0.1 grains per standard cubic foot of stack air flow (567 IAC Chapter 23) was developed when particulate matter was still regulated as total suspended particulate (TSP). This limit was retained when the PM10 NAAQS was implemented in the late 1980s and was approved into the State Implementation Plan for PM10. Subsequent review showed that the limit was not generally protective of the PM10 NAAQS, which frequently results in a time consuming process for the Department and the applicant of incrementally reducing a requested PM10 permit limit during the permit application review process to demonstrate predicted attainment with the PM10 NAAQS.

d. Permit Forms
The workgroup recommendation E4 was that Forms EC, EI and MI2 be modified to add a column for PM2.5 emissions. The Department plans to have updated air construction permit application forms that include these revisions available by April 1, 2011.

e. Additional Recommendations
The workgroup recommended that The Department continue the current policy of not permitting fugitive emissions (E5). The impact of fugitive emissions, as defined by EPA, on ambient air quality are typically only included in permitting projects that trigger a Prevention of Significant Deterioration (PSD) review. This will continue to be The Department's practice.

In recommendation E6, the workgroup recommended that The Department continue the current permitting policy of not including PM2.5 permit limits in the air construction permits until the state rules are amended and final, unless requested by a permit applicant. The Department plans to start permitting for PM2.5 on January 1, 2012. All necessary rulemaking activities and updates to associated guidance and forms will be completed by this date. This date will also allow facility owners and operators ample lead time to begin planning to include PM2.5 in future permitting projects. Note that PM2.5 limits are already required to be included in permits issued for projects that trigger a PSD review.

This recommendation also stated that The Department should continue use of PM10 as a surrogate for PM2.5 permitting. The Department's response to this recommendation is addressed under recommendation C1.

Policy & Government Relations
The workgroup in F1 recommended the State's Implementation Plan (SIP) include a fiscal impact statement similar to what is Chapter 17 of the Iowa Code but also include business, economic, environmental, and health impacts. Fiscal impact information will be gathered from EPA, industry, environmental groups, public health groups, and other sectors and will be included in the SIP.

The Department agrees with recommendation F2, which doing nothing in regards to PM2.5 was not option and to continue to work with stakeholders, was reinforced by the majority of workgroup recommendations. The Department concurs and fully supports the above recommendations. The Department will continue to include businesses, environmental groups, and the general public in the process of implementing federal and state requirements.

Diesel emissions were the topic of recommendation F3**:** The Department should adopt or develop an outreach program to address excess idling; develop no-idle legislation, and request input on the federal diesel emission reduction funding (DERA). The Department concurs with reducing diesel emissions from excess idling. It is a winning scenario that reduces emissions, saves money and resources, and reduces the public health impact. The Department supports legislation and non-regulatory approaches on this topic. The Department will request input on DERA grant opportunities via list serve and Air Quality Client Contact meetings.

Many companies that operate in Iowa, such as Cessford Construction/Oldcastle Materials Group and the McAnich Corporation, have adopted anti-idling measures. An option for the State in lieu of direct regulation would be to encourage adoption by example. An executive order issued by the Governor could direct the state fleet to adopt and enforce such measures. Anti-idling measures would reduce emissions, save money by reducing fuel consumption and

engine, and address public health concerns wear while still providing sufficient measures to run the vehicle for health and safety measures.

Recommendation F4 asks The Department to develop and implement tools for demonstrating compliance with the Ambient Air Quality Standards that may be used in addition to or in lieu of air dispersion modeling of minor sources for PM2.5 emissions. This action may be supported by EPA's Guideline on Air Quality Models [40 CFR Part 51 Appendix W] which states "this section recommends procedures that permit some degree of standardization while at the same time allowing the flexibility needed to assure the technically best analysis for each regulatory application." Flexibility through the use of measured data in lieu of model estimates is an example of one additional tool that may be considered for further development.

The workgroup expresses concerns regarding enforcement with the new PM2.5 NAAQAS in recommendation F5: "Therefore we recommend the Department focus on compliance assistance activities prior to taking enforcement actions until representative emission factors are available." The Department will focus on compliance assistance as both the Department and industry gather more information and knowledge as the new standard is implemented. It is important to note that compliance assistance will not preclude the Department from protecting public health or the environment.

Many workgroup subcommittees recommended education and outreach. Recommendation F6 focused on increasing public awareness and active participation in air quality issues. Reducing individual contributions to air pollution and using social media was unique to this recommendation. Current communications are perceived to focus on the enforcement actions rather that promoting positive actions.

The Department currently uses list serves, presentations, and public meetings to provide education and outreach. Cost efficiency has limited the delivery mechanism to subscriber based messages. The Department provides presentations as requested to interested parties. The Department can provide information for the Communications Bureau to send via Twitter, Facebook, and other social media outlets. Education campaigns are most effective with sustained staffing and funding. Any additional measures other than as described above would require additional resources.

The workgroup in F7 recommended that the Iowa General Assembly adequately fund the Department's Air Quality Bureau to implement the PM2.5 NAAQS. Implementation of this is an issue which affects all citizens of the State of Iowa and therefore should be funded by the State, who is charged with protecting their health and welfare.

The cost to implement the PM2.5 NAAQS and other new federal requirements within the Department is staggering. A violation of the NAAQS adds an additional burden to industry, to Iowans, and the Department. The workgroup recommended that the Iowa General Assembly should adequately fund the Department in order to implement the PM2.5 NAAQS. Insufficient funding would result in decreased permit turnaround time, lack of air quality data needed for complex permitting, and likely inability to meet federal requirements in a timely manner. Many states, like Wisconsin and Minnesota, have added new fees and increased existing fees in an attempt to adequately fund their air pollution control programs.

Transportation

The majority of the workgroup recommended in G1A, G2B, G4, and G5 were that the following studies be funded and conducted on:

- Primary and secondary PM2.5 and precursor emissions from transportation;
- The contribution of on-road sources to secondary organic aerosols, both in urban and rural environments;
- MOVES modeling be studied in more detail to determine the appropriate roles for all interested agencies and provided appropriate training;
- Production and combustion of biofuels and the impacts on PM2.5 levels

A minority recommendation in G6 concerned the study of other states' inspection and maintenance programs, notably California. Many studies on PM2.5 are being conducted both nationally and internationally. While the Department does not disagree with the need for additional research in the areas specified in the recommendations, it is recommended that Iowa Regents institutions be consulted prior to initiating a new research project.

The workgroup recommended in G1B that state and local governments should collaborate in transportation planning activities to reduce PM2.5 emissions from the transportation sector. In G2A it was recommend that any future corrective measures should not disproportionally burden transportation activities in the urban and rural areas of the state.

The Department concurs with these recommendations. The Department has on-going collaboration with DOT on the Iowa Clean Air Attainment Program and will continue to seek avenues in the future to expand collaboration with DOT and local governments in transportation planning activities. The strengthened PM2.5 NAAQS requires even more coordination with DOT on projects across the State. In addition the Department has provided presentations to local governments, council of governments, economic development organizations, and metropolitan planning organizations regarding PM2.5 issues in Iowa. The Department will continue to provide outreach to these organizations as resources allow.

Full implementation of many of the workgroup recommendations in this area will require funding for staff and equipment to carry out additional studies. The Department concurs with the workgroup's recommendation G7 that the Iowa General Assembly, after consideration of the priorities created by the workgroup, move to make necessary appropriations for the Department's Air Quality Bureau to carry out these studies and other recommended actions.

The workgroup recommended in G3 that all nine existing Technical Advisory Committees to MPOs in Iowa consider adding an advisor and/or representative who is knowledgeable about air quality issues. They also stated that such expertise needs to include transportation-related PM2.5 but should not be limited to this pollutant or to this major emissions category. It was also recognized by the workgroup that many MPOs already have or currently are planning to include such expertise in their deliberations. The Department will assist MPO staff as resources allow, and as requested by MPOs, to become more knowledgeable in air quality issues.

Section III: Workgroup Recommendations

Area Sources Subcommittee Recommendations

The subcommittee met six times and reviewed information on a variety of sources. It was tasked with 14 brainstorming ideas. Nine recommendations were presented to the workgroup. Duane Gangwish was the chair and Kate Allen was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/as_sub.html. The subcommittee members are listed below.

Company	**Representative**
Iowa Health Systems	Kate Allen
Iowa Pork Producers Association	Tyler Bettin
Linn County Public Health - Air Quality Division	Shane Dodge
Iowa Cattlemen's Association	Duane Gangwish
Iowa Farm Bureau	Chris Gruenhagen
Iowa State University	Steve Hoff
Iowa State University	Jacek Koziel
Iowa Society of Solid Waste Operations	Laura Liegois
Sierra Club	Pam Mackey-Taylor
Bi-State Regional Commission	Gena McCullough
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
Iowa Farmers Union	Chris Petersen
DNR - Field Services	Joe Sanfilippo
Iowa Pork Producers Association	Jeff Schnell
Iowa Limestone Producers Association	Todd Scott
Boone County Landfill/Iowa Society of Solid Waste Operations	Scott Smith

DNR Technical Support Staff: Christine Paulson and Amber Wolf

1. Open Burning
a. Combustion: wood stoves & outdoor boilers (Question 6)

Recommendation A1: DNR should create a general public education program about the proper use of fireplaces, wood stoves and outdoor boilers and information on best practices for emission control **(Majority Recommendation).**

Draft recommendation: DNR should be encouraged to issue an advisory to inform the public about actions they can take to reduce their contributions from open burning sources when there are high measured air quality levels (AQI greater than 100) (Not moved forward to full workgroup).

b. Fire (Questions 5, 10, 11)
i. Residential Trash and Landscape waste

Recommendation A2: The subcommittee supports, with three abstentions, asking the Department to advocate for the legislation comparable to the intent of House File 627, as amended by HF1250, which would phase in prohibiting open burning of residential waste within city limits. Legislators should continue support the financial needs of smaller communities with regards to refuse pickup. The dates contained in the legislation should be adjusted to reflect a later time frame. The Department is encouraged to engage stakeholders to discuss the feasibility of refuse collection, recycling and composting services in smaller communities and rural areas to discuss if any changes have occurred since the 2006 task force **(Majority Recommendation).**

ii. Open burning
1. Recreational fires

See draft recommendation 2 (Not moved forward to full workgroup).

2. Prescribed burns

Recommendation A3: Continue to support the Department Prescribed Fire Policy dated March 2010. Furthermore, monitor and consider EPA's future policy on Smoke Management relative to Prescribed Fire **(Majority Recommendation).**

2. Agricultural Sources (Questions 2, 3)
a. Tillage & fertilizer application (Questions 7, 14)

Recommendation A4: The subcommittee defers the issue of tillage and harvest related dust as a low priority for the control of PM2.5. This deferment is based on tilling as well as dust emission from rural roads are not considered to be significant in the creation of PM2.5, due to crustal material unlikely to be suspended in the air and is overestimated per the EPA. This fact is assumed to apply to harvest related dust as well. Therefore, the subcommittee recommends no action be taken on these activities in regard to PM2.5 **(Majority Recommendation).**

b. Livestock (Questions 4, 9, 13)

Recommendation A5: Facility siting should be considered as a pollutant control mitigation strategy for air emissions from livestock farms to reduce human impact. Two of the organizations represented on the subcommittee believe the current state level siting requirements are not stringent enough **(Majority Recommendation)**.

Recommendation A6: Iowa should not move ahead of the EPA in developing regulations on air emissions of the livestock industry. The NAEMS study results have been submitted to EPA and EPA may develop additional regulations based on the emissions methodologies being developed. Consideration of state level regulations should be deferred until EPA has developed their emissions factors, modeling, sampling protocols and resulting regulations **(Majority Recommendation).**

Recommendation A7: Iowa should support continued research and voluntary adoption of mitigation strategies. Because of the diversity of animal production systems, Iowa should support on-farm research to refine efficacy and protocols for mitigation strategies **(Majority Recommendation).**

Recommendation A8: The legislature should fund a review and update of the publication "Reduce Ammonia Emissions from Livestock Operations" to determine if any additional technology or methodology has been introduced since 2004 **(Majority Recommendation).**

Draft recommendation : The subcommittee defers this question as Question 13 is not relevant to PM2.5, so that topic is not being addressed.

c. Farm Machinery (Question 1)

Draft recommendation: Subcommittee concluded that since new farm equipment must meet EPA standards, the topic is outside the scope of our jurisdiction. Question was easily answered from information on EPA's non-road diesel program, which integrates engine and fuel controls and will reduce PM and NOx emissions by 90%. Any grants awarded by the Department of federal diesel emission reduction act (DERA) funding should consider inclusion of farm machinery **(Not moved forward to full workgroup).**

Draft recommendation: The subcommittee defers the issue of agricultural equipment emissions as a low priority for the control of PM2.5. This deferment is based on the fact that agricultural equipment is currently under rules already in place by the EPA's non-diesel program. The subcommittee believes the EPA rules are sufficient **(Deferred)**.

3. Other sources
a. Landfills

Background information: Landfills in Iowa are responsible for dust control on site at the landfill facility. Operations from daily activity and construction can cause dust at landfill activities during dry periods. Landfills are responsible for handling dust control by utilizing water on roads in their facilities and on construction projects.

Landfills are permitted for operations and part of the operational permit requires an operational plan that addresses dust control. The Iowa Administrative Code 567 Chapter 113.8(3)g. Dust. The operator shall take steps to minimize the production of dust so that unsafe or nuisance conditions are prevented. Leachate shall not be used for dust control purposes. Landfills are to abide by the rules to reduce air born dust particles at facilities based upon the chapter 113 landfill rules.

Majority of landfills utilize water tank trucks to wet down haul roads in the landfill to reduce dust issues. Landfills also use the county approved method for dust control on roads to assist with dust issues.

Draft recommendation: The subcommittee is waiting for resolution of Title V permitting requirements before making a recommendation.

b. Cold weather/winter effects (Question 8)
Background Information: We know that cold weather PM2.5 episodes contain lots of ammonium nitrate, generated by the combination of nitric acid and ammonia in the atmosphere. Nitric acid is formed in the atmosphere from NOx, a pollutant that comes from combustion. Ammonia comes from commercial fertilizer, manure, vehicles, and wastewater. Under meteorological conditions where there is low wind, cold moist weather and temperatures between 20 and 40 degrees Fahrenheit, the reaction of ammonia and nitric acid forms ammonium nitrate PM2.5. The amount of ammonium nitrate produced is limited by the pollutant with the lowest (molar)

concentration. Dr. Stanier's "On the LADCO Winter Nitrate Study Findings" presentation noted that, contrary to prior assumptions, it appears that fine particle nitrate formation in rural areas may be ammonia limited, rather nitric acid limited, as was previously assumed.

Recommendation A9: The subcommittee members recommend that PM2.5 precursor emissions of both NOx and ammonia be explored **(Majority Recommendation).**

4. Paved and unpaved roads – Referred to the Transportation subcommittee.

Emissions Inventory / Stack Testing Subcommittee Recommendations

The subcommittee met six times. It was tasked with 20 brainstorming ideas. Three recommendations were presented to the workgroup. Rich Stephens was the chair and Brian Trower was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/eist_sub.html. The subcommittee members are listed below.

Company	**Representative**
Central Iowa Power Cooperative	Rex Butler
POET	Rafe Christopherson
Iowa Farm Bureau	Chris Gruenhagen
Linn County Public Health - Air Quality Division	Jim Hodina
Iowa State University	Steve Hoff
Thompson Environmental	Doug Judge
Waste Management	Debra McDonald
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
SSAB Iowa Inc	Tom Sanicola
Schebel Environmental	Heather Schebel
Gerdau Ameristeel	Jack Skelley
ADM Corn Processing	Rich Stephens
Trinity Consultants	Gene Taylor
City of Ames	Brian Trower
Gerdau Ameristeel	Jennifer Van Hall
Deere & Company	Fred Van Schepen
Iowa State University	Lindsey Wanderscheid

DNR Technical Support Staff: Nick Page, Mark Stone

First Recommendation

The EIST recommendation B1 addresses PM2.5 test methods and relates to brainstorming topics 3, 6, 15, 17, 19, and 20.

The EIST subcommittee is recommending to the large PM2.5 workgroup that Iowa should not do anything regarding PM2.5 stack testing methods and guidance until EPA promulgates final PM2.5 test methods.
After EPA promulgation of the federal test method(s) the Department should invite stakeholders to participate in a workgroup to adopt the method(s) and develop guidance for use of the method(s) (Majority Recommendation).

The advantage for waiting for EPA to promulgate final test methods is that guidance and rules are not implemented that need to be changed later. The disadvantage is that it leaves PM2.5 testing open for interpretation and implementation and can create some uncertainty of the results. At this time Other Test Method (OTM) 27 and 28 are available as proposed PM2.5 test methods. It is anticipated that EPA will promulgate PM2.5 test methods before PM2.5 limits are written into minor source permits.

An advantage for having a stakeholder's group attempt to develop guidance for use of the OTM methods is that the group has an opportunity to identify issues and possible resolutions for sources located in the state. At this time each source is on their own to work out issues and problems with the regulatory stack test coordinator. A disadvantage of developing guidance early is that the promulgated test method could be significantly different from the OTM method. Also the guidance would need to be re-worked by the stakeholder's group after the PM2.5 test method(s) are promulgated.

One option that received zero votes within the EIST sub-committee voting was to include PM2.5 test method(s) into the SIP. An advantage is that it can bring some clarity to how PM2.5 testing will be implemented in Iowa. Disadvantages include that it requires a long time to change the SIP, the difficulty of identifying what to include at this time, possibility of creating undue burdens compared to other states, EPA may or may not approve what is proposed, and the potential for lack of flexibility for changing from what is listed in the SIP.

Second Recommendation
The EIST recommendation B2 addresses PM2.5 emission factor quality and availability and relates to brainstorming topics 1, 7, 9, 11, and 18.

Stay with current preferred hierarchy for emission factors (1 is highest and 6 is lowest preference):

1) CEM (not available for PM2.5)
2) Stack Test Data (proposed methods could be used to collect data, data from similar sources could be used)
3) Mass Balance
4) EPA Emission Factors (WebFire, AP-42, EPA PM Calculator, NESHAP data, etc.)
5) Vendor Data
6) Engineering Estimate

EPA emission factors are rated based upon the quality and depth of the test data used to develop the emission factor. An A rating is best and an E rating is worst. A new rating system is being developed at EPA and maybe available in the future (Majority Recommendation).

Available PM2.5 emission factors are very limited at this time. More emission factors will be available over time as more testing is completed and reviewed. No other sources of PM2.5 emission factors were identified and no other alternative to the current hierarchy was identified by the sub-committee.

Third Recommendation
Recommendation B3 addresses brainstorming topics 9, 11, and 12.

The EIST sub-committee is recommending that the Department develops and maintains a comprehensive stack test database that summarizes each stack test that is submitted to the agency; including PM 2.5 particulate testing results. This database would greatly benefit and assist stakeholders in the selection or development of emission factors for their processes.

Assuming that stack tests submitted to the Department are considered public records, this database should be made easily accessible to any stakeholder, either by unrestricted access (similar to accessing U.S. EPA's WebFIRE or AP-42), or via a user name/password process.

The data should be categorized so that stakeholders can search the database by process type, so they can easily find by group all results for the process they are looking for. Initially, the expectation would be that the database would be populated with raw (not adjusted statistically or normalized) test data. As the database evolves and matures, there may be justification and reasons for adjusted or converted data, nevertheless, the raw stack test data should still be available.

It is the opinion of the EIST sub-committee that this database is important enough that funding for the startup development and ongoing maintenance of the database should be secured. Once the database has been developed, the primary ongoing work to maintain the database is the entry of stack test results as they are received by the Department (Majority Recommendation).

When PM2.5 stack test results become available an easily accessible and organized data system will be an advantage for all stakeholders. This data can be used to speed the development of emission factors for sources. The disadvantage of not organizing and making the stack test results available is the slower development of emission factors.

No recommendations were made for brainstorming topics 2, 4, 5, 8, 10, 13, 14, and 16. These questions/topics were either addressed by another sub-committee or were specific questions and were answered in the meeting notes. This sub-committee did not address secondary formation of PM2.5 emissions which contributes to the majority of the monitored ambient PM2.5 concentrations.

There is concern within this sub-committee that a great amount of PM2.5 testing resources may be required without much impact to NAAQS compliance due to small point sources being a minor portion of the monitored PM2.5 concentrations.

	Issues from the June 23, 2010 Brainstorming Session	**Points**
1	Are EPA emission factors and inventories accurate and are they scientifically defensible?	10
2	What are the alternatives to stack testing for PM2.5?	8
3	Is there an acceptable reference method for PM2.5?	7
4	Should filterable & condensable PM2.5 be reported separately in emission inventories?	6
5	Pertaining to off-road mobile equipment and diesel engines/generators (in the aggregate mining sector), what information would be needed to calculate PM2.5?	5
6	Testing requirements for PM2.5? Methods and timelines.	4
7	There are limited to no emission factor data for many operations, especially non-combustion operations. With some of these operations, it can be very difficult to quantify the PM subset group 2.5. How will these issues be addressed?	3
8	Will biogenic emissions from point sources be included? Biogas offsetting natural gas?	2
9	What are the best PM2.5 emission factors to use? EPA, AP-42, PM calculator, stack test results, CEMS, ration of PM2.5/PM10?	1
10	How do we classify an activity like a landfill? As a point source or non-point source?	1
11	How do we ensure that accurate PM2.5 emission factors are being used	1

	for permitting, modeling, and emission inventory purposes?	
12	How are we going to collect PM2.5 emission data and develop better quality emission factors and emission inventories?	0
13	What is the SO2 concerns from landfills or solid waste facilities?	0
14	EPA has included "crustal material" in the definition of PM2.5. How much influence does crustal material have on the total mass of PM2.5?	0
15	Do we need to update the sampling manual to address provisions not covered in the PM2.5 methods?	0
16	Should all new sources be required to stack test for PM2.5?	0
17	Issues with stack testing: varying flow, high temperature stacks, wet exhaust problems, final EPA rule	0
18	Are there CEMs for PM2.5?	0
19	Do we need a protocol for a minimum catch?	0
20	How to define the relationship between emission standards, the reporting & test methods. Are the precursors like ammonia going to be tested & limited? How many for a typical industry? Make sure the test methods and typical testing requirements are defined in the rules.	0

Modeling / Ambient Monitoring Subcommittee Recommendations

The subcommittee met four times. It was tasked with 21 brainstorming ideas. Three recommendations were presented to the workgroup. Gary Douglas was the chair and Mick Durham was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/maam_sub.html. The subcommittee members are listed below.

Company	**Representative**
Polk County Public Works - Air Quality Division	Jeremy Becker
Central Iowa Power Cooperative	Rex Butler
POET	Rafe Christopherson
Linn County Public Health - Air Quality Division	Anthony Daugherty
Douglas Environmental Consulting	Gary Douglas
Grain Processing Corporation	Mick Durham
DNR - Air Quality Bureau	Sean Fitzsimmons
Polk County Public Works – Air Quality Division	Jeff Gabby
Iowa Farm Bureau	Chris Gruenhagen
MidAmerican Energy Co.	Jon Kallen
Iowa's Electric Cooperatives	Mark Landa
Larson Engineering PC	Lisa Larson
Alliant Energy	Michael Li
Waste Management	Debra McDonald
Iowa Renewable Fuels Association	Grant Menke
Alcoa, Inc.	John Mitchell
Iowa Association of Business & Industry	Nicole Molt
Martin Marietta Materials, Inc.	Shelby Olsen
Grain Processing Corporation	Darin Osland
Stanley Consultants Inc	Lain Pacini
Muscatine Power & Water	Don Pauken
SSAB Iowa Inc	Tom Sanicola
Gerdau Ameristeel	Jack Skelley
Archer Daniels Midland	Sara Speser
Archer Daniels Midland	Rich Stephens
Trinity Consultants	Gene Taylor
University of Iowa	Mike Valde
Iowa State University	Lindsey Wanderscheid
Iowa Department of Public Health	Tim Wickam

DNR Technical Support Staff: Sean Fitzsimmons, Lori Hanson, Gary Smith

1. How will compliance be met when the background is above the maximum PM2.5 NAAQS? **Out of scope since this would involve non-attainment issues.**

2. Should PM2.5 be modeled at all at this time? Should it be limited to major sources?

Committee recommends C1 that the model for $PM_{2.5}$ for minor source/project permits using the current PM_{10} modeling guide against the PM_{10} NAAQS. PM_{10} is used as a surrogate pollutant for $PM_{2.5}$. **(Majority Recommendation)**

3. Does the Department need to follow EPA guidance or can we develop our own modeling guidance/methods for our non-PSD modeling?
The Department can perform modeling outside EPA guidance, but would need agency approval for any deviations, e. g. using the paired sums method of ambient air data evaluation.

4. Will direct PM2.5 be modeled only since secondary PM2.5 is regional and is included in background?
The committee only considered modeling direct PM2.5 emissions. Secondary PM2.5 formation was considered to be beyond the scope of the group.

5. What would the state models look like if we assumed a 10-25% emissions reduction from all of the source categories that contribute more than 10% of the total PM2.5 emissions?
Not considered.

6. How will the Department deal with PM2.5 modeling if a facility exceeds the (modeled) NAAQS due to background concentrations for minor source permits?
Facility will have to work with the Department on alternatives to fit the model on a case by case basis. Committee recommended C2 that should EPA finalize test methods for $PM_{2.5}$, a workgroup should be convened to discuss future $PM_{2.5}$ modeling policy **(Majority Recommendation).**

7. Will the implementation team investigate modeling off-ramps for non-PSD modeling (installation of BACT, RACT, new state standards?
This was considered. Other states surveyed did not have modeling off ramps. **See recommendation for item 6.**

8. How will modeling play in the PM2.5 implementation (if, who, what, when)?
See item 6.

9. Have we firmly established background levels for state, region, counties?
No, background is firmly established only where monitors are located.

10. Are there sufficient monitors throughout the state to have the information (data) needed?
This depends on source location. **See item 11.**

11. If the monitors report back high levels, is the plan to encompass a facility with monitors?
Committee recommends C3 that the Department allow sources to voluntarily install, submit and use independent PM2.5 ambient air monitoring equipment and monitoring results to assess baseline source project impact potential and to demonstrate compliance with the PM2.5 NAAQS in lieu of modeled compliance. Any entity that wishes to do this must coordinate the installation of monitors with the Department Air Quality Bureau. This includes the location and operation of the monitors. EPA guidance and regulations on operation of the ambient PM2.5 monitors will be followed. The capital and operating costs of the monitors will be borne by the source **(Majority Recommendation).**

12. Will only direct PM2.5 emissions be modeled or if secondary formation will be considered will the department thresholds be established and how would secondary formation be modeled?
At this point, modeling only addresses direct emissions of PM2.5.

13. Should enclosure credit be allowed for PM2.5 for estimating emissions and for modeling?
Not considered.

14. How effective is increasing stack height and does it improve all parameters?
Not considered.

15. How much more clean can we get the air before we reach background levels?
Not considered

16. Any additional modeling tools other than AERMOD being considered as it does not account for atmospheric chemistry processes that form most of the PM2.5 in ambient air?
Yes

17. What modifications are needed to the modeling guidelines and forms?
Deferred to the Permitting subcommittee.

18. Does the Department have a blueprint to improve PM2.5 monitoring (new sites, greater frequency, etc.)?
Not considered

19. Can I have a monitor for my house?
Not considered

20. How can a monitor that is adversely affected by a single source of pollution be considered a representative sample location?
Not considered.

21. How can the Department improve consistency of monitoring (placement of monitors in relation to specific sites, sampling frequency)?
Not considered.

On the Books/Precursors/Transport Subcommittee Recommendations

The subcommittee met four times. It was tasked with 12 brainstorming ideas. Two consensus recommendations, two split decision recommendations, and two minority recommendations were presented to the workgroup. Four recommendations were approved by the full workgroup. Leland Searles was the chair and Lindsey Wanderscheid was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/otbtp_sub.html. The subcommittee members are listed below.

Company	**Representative**
Center for Global and Regional Environmental Research	Greg Carmichael
Stanley Consultants Inc.	Chad Daniel
South Iowa Municipal Electric Cooperation Association	David Ferris
DNR - P2 Services	Jeff Fiagle
Iowa Farm Bureau	Chris Gruenhagen
Thompson Environmental	Doug Judge
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
Iowa Environmental Council	Leland Searles
Iowa State University	Lindsey Wanderscheid

DNR Technical Support Staff: Matthew Johnson

Background to brainstorm idea 1, strategies to reduce precursor emissions:
Background: three to four types of pollutants are known to be important precursors in the formation of secondary PM2.5 that contribute to air quality alerts and NAAQS exceedances in Iowa localities, as well as nonattainment findings. These are NH3, NOx, SO2, and VOCs. At present, NOx and SO2 are "assumed precursors" for PM2.5, while VOCs and NH3 are not because of current or historical lack of research. Dr. Stanier's presentation to the full workgroup, "On the LADCO Winter Nitrate Study Findings," indicates that ammonia, and not NOx, is the limiting pollutant during cold, moist, winter conditions. That is, ammonia occurs at sufficiently low concentrations that it restricts secondary (ammonium nitrate) PM2.5 formation. Potentially it may be controlled and regulated to good effect, as NOx currently is.

In regard to the assumed precursors, NOx and SO2, a variety of on-the-books and on-the-way EPA rules cover these either directly (e.g., 1998 NOx SIP call, CAIR, and the proposed Transport rules) or indirectly (various NESHAP and MACT rules, and probably the recently finalized light duty gasoline and the recently proposed Heavy Duty vehicle GHG emissions & vehicle fuel efficiency rules).

Recommendation D1:

a) In regard to wastewater treatment plants emissions of NH3 the committee recommends utilizing biotrickling filters, artificial or natural wetlands or ion exchange processes **(Minority Recommendation).**

b) We recommend that the Department consider ways to address secondary PM2.5 formation by control of both NOx and ammonia (NH3) once EPA's analysis of the NAEM study regarding ammonia from concentrated animal feeding operations (CAFOs) is available **(Not moved forward to full workgroup).**

c) In regard to fertilizer NH3 emissions, Iowa State University Extension recommends that fertilizer be applied at the most appropriate soil temperatures to minimize water quality concerns **(Statement- not voted on).**

Draft recommendation : We recommend that the Department conduct an analysis to determine if and how ammonia should become an "assumed precursor," based on Dr. Stanier's findings, and at what emissions tonnages or rates it would trigger a PM2.5 review **(Not moved forward to full workgroup).**

Background to brainstorm ideas 2, 3, 4, 8, 9, 10, 11, & 12 inclusive:
Background: The subcommittee acknowledges several recent regulations have been approved and are in the process of being implemented by EPA. Many of the new regulations are believed to have a positive development in reducing PM2.5. The subcommittee believes the regulations listed below address several of the brainstorming questions brought forth by the full workgroup at the first meeting.

Partial list of on-the-books & on-the-way rules & rule changes:

- Reductions of NOx under the NOx SIP Call, (1998)
- CAIR (still in effect), (2005)
- Clean Air Visibility (BART) Rule, 2005
- Transport Rule, proposed, (expected 2011): Iowa is one of 31 states included, and among several states that would have PM2.5 precursor requirements (but not ozone precursor requirements)
- Transport Rule Part 2, (date unknown): would address downwind ozone, but no details are known
- Cement kiln NESHAP/MACT, (2010): PM2.5, NOx, SO2, & other HAPs
- ICI boiler MACT rule, (expected Jan 2011): PM, SO2, VOCs, & other HAPs
- Utility boiler MACT rule, (expected Nov 2011): under development
- New compression & spark ignition engine RICE rules, (2008): NOx & VOCs
- Existing compression & spark engine RICE rules, (2010): PM2.5, NOx, VOCs, other HAPs & criteria pollutants
- Continued benefits from Tier 2 vehicle & gas rules, (2000): SO2
- On-road heavy-duty vehicle & low-sulfur fuel rule, (2001): NOx, SO2, PM
- Large and small off-road spark ignition engines, (2002 and 2008, respectively)
- Nonroad diesel engine rule (Tier 4) and low-sulfur fuel rule, (2004)
- Final greenhouse gas & fuel efficiency rule (2010) for light duty gasoline vehicles, and proposed rule (2010) for heavy-duty vehicles: co-benefits for direct & secondary PM2.5 are likely, but EPA has not made public specific estimates for NAAQS pollutants.

Recommendation D2: The subcommittee recommends the Department work with stakeholders in regards to the development and implementation of the on-the-books and upcoming regulations. The subcommittee encourages the Department to continue to address/develop best management practices to help reduce other PM2.5 precursors **(Majority Recommendation).**

Background idea to brainstorm idea 5: interstate transport:

Background: The proposed Transport rule includes Iowa as a state that contributes to high levels of PM2.5 in downwind states. Iowa is not included as a contributor to downwind ozone.

Recommendation D3: The Department should continue to use regional modeling methods developed by EPA, the Department, Regional Planning Organizations, and research institutions to evaluate the impact of forthcoming regulations and scientific developments related to the formation and interstate transport of fine particulate matter **(Majority Recommendation).**

Background brainstorm idea 7: prioritization & control of PM2.5 precursors:
Background: Four categories of precursors are regarded by researchers as significant in the formation of PM2.5: volatile organics (VOCs), SO2, NOx, and NH3. They vary in importance by atmospheric conditions, season of the year, and availability of one or more of the other precursors. SO2 and NOx are currently regulated as criteria pollutants for ambient concentrations and under facility permitting programs. Research on the role of VOCs in secondary PM2.5 is ongoing, and understanding of specific organics, chemical processes, and conditions of formation are tentative at present. Ammonia is widely available at all seasons, especially during wintertime on days when conditions favor the formation of ammonium nitrate (NH4NO3). Sources of NH3 are well understood at present, but there is uncertainty about the magnitude of contributions from specific sources. EPA emissions inventories suggest that animal husbandry, followed by crop fertilizers, are the overwhelming sources in the Upper Midwest. The NAEM study results will provide a clearer picture of ammonia concentrations and PM2.5 formation.

Recommendation D4*, Brainstorm idea 7:* The Department, in cooperation with other state agencies & interested trade groups, expand the educational & outreach efforts regarding Best Practices for NH3 controls **(Majority Recommendation).**

Draft recommendation : The Department should emphasize in its educational & outreach efforts the use of Best Practices & higher levels of conformity to existing state laws for agricultural sources of NH3. These efforts should include such methods as biofiltering in the ventilation systems of CAFOs, storage lagoon covers, & minimum knifing-in depths for field-applied manure. In the absence of staff for compliance & enforcement of existing siting, winter manure application, & distance requirements in the Iowa Code, the Department should work with IDALS to assure better compliance & better understanding among those affected by the laws regarding the rationale & underlying need **(Not moved forward to full workgroup).**

Additional Background Information

Brainstorm idea 6: secondary PM2.5 & scaling of precursors:
Background: At present there is some guidance from EPA that will be useful for scaling of NH3. Scaling proportions already exist for NOx and SO2 because they are “assumed precursors.” In general scaling is done for nonattainment conditions. If scaling for ammonia is to be done in Iowa, it would likely occur if the Department makes NH3 an “assumed precursor.” Such action would not place more source sectors under Title V permitting, but current Title V emitters might be required to include NH3 if modeling and/or testing demonstrate a need.

There is no recommendation apart from those under idea 1.

Permitting Subcommittee Recommendation

The subcommittee met four times. It was tasked with 29 brainstorming ideas. Nine recommendations were presented to the workgroup. Mick Durham was the chair and Gary Douglas was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/p_sub.html. The subcommittee members are listed below.

Company	**Representative**
Martin Marietta Materials, Inc.	Ryan Carlson
POET	Rafe Christopherson
Linn County Public Health - Air Quality Division	Anthony Daugherty
Douglas Environmental Consulting	Gary Douglas
Grain Processing Corporation	Mick Durham
Polk County Public Works - Air Quality Division	Jeff Gabby
Iowa Farm Bureau	Chris Gruenhagen
MidAmerican Energy Co.	Jon Kallen
HNI Corporation	Scott Lesnet
Alliant Energy	Michael Li
Iowa Society of Solid Waste Operations	Laura Liegois
Waste Management	Debra McDonald
Alcoa, Inc.	John Mitchell
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
Pella Corporation	Terry Noteboom
Stanley Consultants Inc	Lain Pacini
Muscatine Power & Water	Don Pauken
SSAB Iowa Inc	Tom Sanicola
Gerdau Ameristeel	Jack Skelley
Boone County Landfill/Iowa Society of Solid Waste Operations	Scott Smith
Archer Daniels Midland - Des Moines	Sara Speser
Trinity Consultants	Gene Taylor
Sierra Club	Wally Taylor
University of Iowa	Mike Valde
Gerdau Ameristeel	Jennifer Van Hall
Deere & Company	Fred Van Schepen
Iowa State University	Lindsey Wanderscheid

DNR Technical Support Staff: Lori Hanson, Chris Roling, Gary Smith

Permitting Exemptions

The subcommittee recommendation E1 is that current exemptions be modified to add PM2.5 thresholds based upon techniques used to establish the thresholds for other pollutants listed in the exemption **(Majority Recommendation)**.

Red denotes proposed amendment

w. Small unit exemption.
(1) “Small unit” means any emission unit and associated control (if applicable) that emits less than the following:

1. 40 pounds per year of lead and lead compounds expressed as lead;
2. 5 tons per year of sulfur dioxide;
3. 5 tons per year of nitrogen oxides;
4. 5 tons per year of volatile organic compounds;
5. 5 tons per year of carbon monoxide;
6. 5 tons per year of particulate matter (particulate matter as defined in 40 CFR Part 51.100(pp));
7. 2.5 tons per year of PM10; ~~or~~
8. 5 tons per year of hazardous air pollutants (as defined in rule 567—22.100(455B))~~.~~;
9. 0.52 tons per year of PM2.5.

(rest of exemption remains the same until (6) below:)

(6) For the purposes of this paragraph, “substantial small unit” means a small unit which emits more than the following amounts, as documented in the exemption justification document:

1. 30 pounds per year of lead and lead compounds expressed as lead;
2. 3.75 tons per year of sulfur dioxide;
3. 3.75 tons per year of nitrogen oxides;
4. 3.75 tons per year of volatile organic compounds;
5. 3.75 tons per year of carbon monoxide;
6. 3.75 tons per year of particulate matter (particulate matter as defined in 40 CFR Part 51.100(pp));
7. 1.875 tons per year of PM10; ~~or~~
8. 3.75 tons per year of any hazardous air pollutant or 3.75 tons per year of any combination of hazardous air pollutants~~.~~;
9. 0.40 tons per year of PM2.5.

An emission unit is a “substantial small unit” only for those substances for which annual emissions exceed the above-indicated amounts.

(rest of exemption remains the same until (8) below:)

(8) “Cumulative notice threshold” means the total combined emissions from all substantial small units using the small unit exemption which emit at the facility the following amounts, as documented in the exemption justification document:

1. 0.6 tons per year of lead and lead compounds expressed as lead;
2. 40 tons per year of sulfur dioxide;
3. 40 tons per year of nitrogen oxides;
4. 40 tons per year of volatile organic compounds;
5. 100 tons per year of carbon monoxide;
6. 25 tons per year of particulate matter (particulate matter as defined in 40 CFR Part 51.100(pp));
7. 15 tons per year of PM10; ~~or~~

8. 10 tons per year of any hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants~~.~~;
9. 10 tons per year of PM2.5.

ff. Production welding.
(1) Welding using a consumable electrode, provided that the consumable electrodes used fall within American Welding Society specification A5.18/A5.18M for Gas Metal Arc Welding (GMAW), A5.1 or A5.5 for Shielded Metal Arc Welding (SMAW), and A5.20 for Flux Core Arc Welding (FCAW), and provided that the quantity of all electrodes used at the stationary source of the acceptable specifications is below ~~200,000~~ 12,500 pounds per year for GMAW and ~~28,000~~ 1600 pounds per year for SMAW or FCAW. Records that identify the type and annual amount of welding electrode used shall be maintained on site by the owner or operator for a period of at least two calendar years.

For stationary sources where electrode usage exceeds these levels, the welding activity at the stationary source may be exempted if the amount of electrode used (Y) is less than:

Y = the greater of ~~1380~~ 11x – ~~19,200~~ 160 or ~~200,000~~ 12,500 for GMAW, or
Y = the greater of ~~187~~ 84x -~~2600~~ 1200 or ~~28,000~~ 1600 for SMAW or FCAW

Where x is the minimum distance to the property line in feet, and Y is the annual electrode usage in pounds per year.

If the stationary source has welding processes that fit into both of the specified exemptions, the most stringent limits must be applied.

(2) Resistance welding, submerged arc welding, or arc welding that does not use a consumable
electrode, provided that the base metals do not include stainless steel, alloys of lead, alloys of arsenic, or alloys of beryllium and provided that the base metals are uncoated, excluding manufacturing process lubricants.

kk. Equipment related to research and development activities at a stationary source, provided that:
(1) Actual emissions from all research and development activities at the stationary source based on a 12-month rolling total are less than the following levels:
40 pounds per year of lead and lead compounds expressed as lead;
5 tons per year of sulfur dioxide;
5 tons per year of nitrogen dioxides;
5 tons per year of volatile organic compounds;
5 tons per year of carbon monoxide;
5 tons per year of particulate matter (particulate matter as defined in 40 CFR Part 51.100(pp) as amended through November 29, 2004);
2.5 tons per year of PM10; ~~and~~
5 tons per year of hazardous pollutants (as defined in rule 567—22.100(455B)); and
0.52 tons per year of PM2.5;

Permit By Rule, Permit Templates
The subcommittee recommendation E2 that current permits by rule [e.g. spray booths] be evaluated by applicable stakeholders and modified to add PM2.5 thresholds based upon techniques acceptable to affected stakeholders **(Majority Recommendation)**.

Applicable Emission Standards
The subcommittee recommendation E3 is that PM2.5 limits, such as grains/scf, should not be put into rule **(Majority Recommendation)**.

Permit Forms
The subcommittee recommendation E4 is that Forms EC, EI and MI2 be modified to add a column for PM2.5 emissions **(Majority Recommendation)**.

Dispersion Modeling
The subcommittee recommends that the dispersion modeling requirements in permits should be addressed by the Dispersion Modeling and Monitoring Subcommittee **(not voted on).**

Draft and Final Permits
The subcommittee made no recommendations on changes to draft or final permits **(not voted on).**

Additional Recommendations

- The subcommittee recommendation E5 is that the current policy on not permitting fugitive emissions should be continued **(Majority Recommendation)**.
- The subcommittee deferred numerous PSD, BACT, RACT, significant impact questions to rules, guidance and policy when developed by EPA **(not voted on).**
- The subcommittee recommendation E6 is that continuing the current permitting policy (no PM2.5 permit limits) be continued in the interim until the state rules are amended and final unless requested by applicant. Continue use of PM10 as surrogate for PM2.5 permitting **(Majority Recommendation)**.

Policy & Government Relations Subcommittee Recommendations

The subcommittee met five times. It was tasked with 51 brainstorming ideas. Seven recommendations were presented to the workgroup. Joe McGuire was the chair and Nicole Molt was the co-chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/pgr_sub.html. The subcommittee members are listed below.

Company	Representative
Iowa Health Systems	Kate Allen
Iowa State Association of Counties	Nathan Bonnett
POET	Rafe Christopherson
Stanley Consultants Inc	Chad Daniel
Iowa Environmental Health Association	Tim Dougherty
Vermeer Corporation	Fred Earley
Iowa Farm Bureau	Chris Gruenhagen
Iowa League of Cities	Jessica Harder
Oldcastle Materials Group	Danielle Hargens
Linn County Public Health - Air Quality Division	Jim Hodina
Thompson Environmental	Doug Judge
MidAmerican Energy Co.	Jon Kallen
HNI Corporation	Scott Lesnet
Iowa Department of Economic Development	Jan Loyson
Waste Management	Debra McDonald
Oldcastle Materials Group	Joe McGuire
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
Muscatine Power & Water	Don Pauken
Iowa Farmers Union	Chris Petersen
Izzak Walton League - Iowa Division	Steve Roe
Cambrex Charles City Inc	Jeff Ross
DNR - Field Services	Joe Sanfilippo
SSAB Iowa Inc	Tom Sanicola
Schebel Environmental	Heather Schebel
Iowa Department of Public Health	Stuart Schmitz
Plains Justice	Nicole Shalla
Iowa Association of Municipal Utilities	Julie Smith
Iowa Department of Economic Development	Sherry Timmins
City of Ames	Brian Trower
University of Iowa	Mike Valde
Iowa Department of Public Health	Tim Wickam

DNR Technical Support Staff: Wendy Walker

Economic considerations:
Recommendation F1
Issue: Should a Fiscal Impact Statement be included in the State Implementation Plan?

Recommendation: It is the Policy Subcommittee's recommendation that the State's Implementation Plan (SIP) include a Fiscal impact Statement (FIS). The FIS will look at all aspects of economic/environmental impacts, including all business impact, as well as public health benefits similar to what is found in Iowa Code 17A.4A **(Majority Recommendation).**

Benefits: The FIS will look at all aspects of economic/environmental impacts, including small business impact, as well as public health benefits. This will allow business, industry and environmental groups the opportunity, through public comment, to provide additional input on "hard costs/benefits" not included in the department's fiscal statement.

Disbenefits: If not done we will be forced to rely on US EPA's statement of benefits and other existing information.

Strategies to Adopt: Follow the guidance outlined in Iowa Law on fiscal analysis of administrative rules and incorporate the environmental impacts and health benefits mentioned above. "Iowa Code 17A.4 and 17A.4A requires a fiscal impact analysis for all new administrative rules with an annual impact of $100,000 or an impact of $500,000 over five years. Specifically, Iowa Code 17A.4 and 17A.4A requires agencies to provide a fiscal impact statement outlining expenditures meeting the above threshold by "all affected persons, including the agency itself."
Technical Justification: Does not apply.

Implementation consideration:
Recommendation F2

Issue: Whether or not the State of Iowa should do nothing in regards to the impending changes in the NAAQS (I.E. Is doing nothing an option?)

Recommendation: It is the opinion of this Policy Subcommittee that "doing nothing" is not a viable option and should be taken off the table as an option. It is not the intent of the subcommittee to advocate for more restrictive regulations than federally mandated requirements. We advocate providing input to the Department regarding PM2.5 implementation **(Majority Recommendation).**

Benefits: The State of Iowa, local governments and businesses will have a greater say in how the NAAQS are implemented if we join in the process.

Disbenefits: Time and resources will be needed to put together a comprehensive implementation plan.

Strategies to Adopt: See recommendation #6.

Technical Justification: The US EPA's changing of the PM 2.5 NAAQS is eminent. They will move to regulate Iowa's activities in lieu of local actions in the event Iowa simply maintains the status quo. The State of Iowa, as well as local businesses and governments, have stated unequivocally their desire to have a say in how the new NAAQS will be written, regulated and implemented.

Recommendation F3
Issue: Should the Department develop rules restricting "idling" of diesel engines which are considered a major source of PM 2.5 Emissions?

Recommendations: It is the Policy Subcommittee's recommendation that the Department should adopt or develop an outreach program to address excess idling. As the Department continues to receive federal diesel emission reduction funding (DERA), we recommend the Department seek stakeholder input prior to Department applying for the grant **(Majority Recommendation).** Additionally, the Department should develop for legislative consideration "No Idle" policy for diesel engines **(Majority Recommendation).**

Benefits: Idling diesel engines burn fuel less efficiently than those in motion or operating under a load, and reducing idling time will result in less PM 2.5 emissions. For those businesses, industries and governmental agencies that use diesel engines, there may be a substantial reduction in operating costs resulting from reduced engine wear, less vehicle maintenance and from burning less fuel.

Disbenefits: Developing a list of exemptions to no idling legislation may prove to be a difficult challenge. The costs to write, adopt and implement a No Idle policy may be substantial.

Alternatives: Do nothing and wait for US EPA to develop No Idling Policy and/or Rules.

Strategies to Adopt: The Department should "resurrect" their "proposed rule on no idling" and modify it as necessary based on recommendations from staff and other affected groups. As an alternative the Department should adopt EPA's Model Rule on No Idling and secure funding to implement it from the legislature.

Recommendation F4
Issue: Should the Department move away from using modeling as the only tool to demonstrate compliance with PM 2.5? The Iowa Administrative Code Title 567 Chapter 22.3 Issuing permits for stationary sources states:

> "A construction or conditional permit shall be issued when the director concludes that …. the expected emissions from the proposed source or modification in conjunction with all other emissions will not prevent the attainment or maintenance of the ambient air quality standards specified in 567—Chapter 28"

This is often demonstrated through air dispersion modeling as part of the construction permitting process. However, due to current technical limitations, modeling as the only tool to show compliance with $PM_{2.5}$ may not always be the best or most accurate way of demonstrating compliance with the ambient air quality standards. These technical limitations may include the challenge in determining representative background levels, currently poor $PM_{2.5}$ emission inventories for modeled sources, and the inability of current models to account for secondary formation of $PM_{2.5}$.

Recommendation: Recommend the Departmentdevelop and implement tools for demonstrating compliance with the Ambient Air Quality Standards that may be used in addition to or in lieu of air dispersion modeling of minor sources for $PM_{2.5}$ emissions. This action may be supported by EPA's Guideline on Air Quality Models [40 CFR Part 51 Appendix W] which states "this section recommends procedures that permit some degree of standardization while at the

same time allowing the flexibility needed to assure the technically best analysis for each regulatory application." Flexibility through the use of measured data in lieu of model estimates is an example of one additional tool that may be considered for further development **(Majority Recommendation).**

Benefits: The availability of additional tools may provide multiple alternatives to facilities to demonstrate compliance for new or modified sources. This may be an important tool where air dispersion modeling is insufficient (either over-estimating or under-estimating) to accurately determine ground level concentrations of $PM_{2.5}$. Such tools could provide regulated facilities the ability to construct or modify sources with greater certainty and not utilize overly conservative estimates of source emissions or background concentrations.

Disbenefits – The use of ambient air modeling is generally less costly and a faster means of predicting ground level ambient air concentrations of criteria pollutants. Other methods, such as ambient air monitoring, could be more costly to facilities and slow down the permitting process. Acceptance of tools other than modeling may be less likely to be accepted by some regulatory and environmental stakeholder groups.

Strategies to Adopt: Draft policies by the Departmentand stakeholders which provide a decision path for permit applicants the use of tools to demonstrate NAAQS compliance other than modeling of minor sources for $PM_{2.5}$. Continue agency and stakeholder work to overcome current $PM_{2.5}$ modeling deficiencies that include poor emission inventories/emission factors, definition of $PM_{2.5}$ background levels, and secondary formation of $PM_{2.5}$ precursors.

Technical Justification:

Iowa Administrative Code *567—22.3 (455B) Issuing permits*

22.3(1) *Stationary sources other than anaerobic lagoons.* In no case shall a construction permit or conditional permit which results in an increase in emissions be issued to any facility which is in violation of any condition found in a permit involving PSD, NSPS, NESHAP or a provision of the Iowa state implementation plan. If the facility is in compliance with a schedule for correcting the violation and that schedule is contained in an order or permit condition, the department may consider issuance of a construction permit or conditional permit. A construction or conditional permit shall be issued when the director concludes that the preceding requirement has been met and:

a. That the required plans and specifications represent equipment which reasonably can be expected to comply with all applicable emission standards, and

b. That the expected emissions from the proposed source or modification in conjunction with all other emissions will not prevent the attainment or maintenance of the ambient air quality standards specified in 567—Chapter 28, and

c. That the applicant has not relied on emission limits based on stack height that exceeds good engineering practice or any other dispersion techniques as defined in 567—subrule 23.1(6), and

d. That the applicant has met all other applicable requirements.

U.S. Code of Federal Regulations *40 CFR Part 51 Appendix W*

The U.S. EPA Guideline on Air Quality Models is found in 40 CFR 51 Appendix W. Section 10, "Regulatory Application of Models" provides the following guidance on procedures for the use of air quality modeling and data analysis provides the following federal guidance.

10.1 Discussion

a. Procedures with respect to the review and analysis of air quality modeling and data analyses in support of SIP revisions, PSD permitting or other regulatory requirements need a certain amount of standardization to ensure consistency in the depth and comprehensiveness of both the review and the analysis itself. This section recommends procedures that permit some degree of standardization while at the same time allowing the flexibility needed to assure the technically best analysis for each regulatory application.

b. Dispersion model estimates, especially with the support of measured air quality data, are the preferred basis for air quality demonstrations. Nevertheless, there are instances where the performance of recommended dispersion modeling techniques, by comparison with observed air quality data, may be shown to be less than acceptable. Also, there may be no recommended modeling procedure suitable for the situation. In these instances, emission limitations may be established solely on the basis of observed air quality data as would be applied to a modeling analysis. The same care should be given to the analyses of the air quality data as would be applied to a modeling analysis.

10.2.2 Use of Measured Data in Lieu of Model Estimates

a. Modeling is the preferred method for determining emission limitations for both new and existing sources. When a preferred model is available, model results alone (including background) are sufficient. Monitoring will normally not be accepted as the sole basis for emission limitation. In some instances when the modeling technique available is only a screening technique, the addition of air quality data to the analysis may lend credence to model results.

b. There are circumstances where there is no applicable model, and measured data may need to be used. However, only in the case of a NAAQS assessment for an existing source should monitoring data alone be a basis for emission limits. In addition, the following items (i-vi) should be considered prior to the acceptance of the measured data:

    i. Does a monitoring network exist for the pollutants and averaging times of concern?

    ii. as the monitoring network been designed to locate points of maximum concentration?

    iii. Do the monitoring network and the data reduction and storage procedures meet EPA monitoring and quality assurance requirements?

    iv. Do the data set and the analysis allow impact of the most important individual sources to be identified if more than one source or emission point is involved?

    v. Is at least one full year of valid ambient data available?

    vi. Can it be demonstrated through the comparison of monitored data with model results that available models are not applicable?

c. The number of monitors required is a function of the problem being considered. The source configuration, terrain configuration, and meteorological variations all have an impact on number and placement of

monitors. Decisions can only be made on a case-by-case basis. Guidance is available for establishing criteria for demonstrating that a model is not applicable?

d. Sources should obtain approval from the appropriate reviewing authority (paragraph 3.0(b)) for the monitoring network prior to the start of monitoring. A monitoring protocol agreed to by all concerned parties is highly desirable. The design of the network, the number, type and location of the monitors, the sampling period, averaging time as well as the need for meteorological monitoring or the use of mobile sampling or plume tracking techniques, should all be specified in the protocol and agreed upon prior to start-up of the network.

Recommendation F5

Issue: Should the Department allow "enforcement discretion" for a period of time following implementation of PM 2.5 Rules?

Recommendation: The subcommittee is concerned at the lack of available data and the accuracy of existing data. Therefore we recommend the Department focus on compliance assistance activities prior to taking enforcement actions until representative emission factors are available **(Majority Recommendation).**

Education & Outreach

Recommendation F6

Issue: Should the Department construct and implement a public education campaign?

Recommendation: It is the Policy Subcommittee's recommendation that the Department develop an educational outreach program. The goal of the program would be to increase public awareness and active participation in air quality issues and reduce individual contributions to air pollution. The Department should pursue existing internal avenues to increase public awareness and active participation by using press releases, the Internet, list serves, Twitter, Facebook, and other social media outlets. It is recommended that the Department continue to utilize the existing business assistance programs to provide information. The Department could use these outlets to promote positive actions by business and industry rather than only the enforcement actions **(Majority Recommendation).**

Benefits: There would be a potential to increase revenue streams for air quality programs in response to increased demand for clean air from legislators' constituencies. Providing information may result in a reduction of individual emissions of PM due to increased awareness and "self-restriction" on the part of the general public.

Disbenefits: There would be a substantial cost of resources incurred by the Department if it undertook an educational campaign. There is no guarantee of any behavioral changes as a result of such a campaign.

Alternatives: Hope the media, and others affected by this process, will present accurate, unbiased and timely information to decision makers.

Strategies to Adopt: The Department should explore additional revenue sources to support an educational outreach program in the form of State General Fund, Environment First funds, or grants.

Funding considerations
Recommendation F7

Issue: Should the Department develop a reasonable fee schedule for minor source permits as a way to generate revenue to support the implementation of PM 2.5 rules?

Recommendation: It is the Policy Subcommittee's recommendation that the Iowa General Assembly adequately fund the Department's Air Quality Bureau to implement the PM2.5 NAAQS. It is the belief of many on the Policy Subcommittee that this is an issue which affects all citizens of the State of Iowa and therefore SHOULD be funded by the State who is charged with protecting their health and welfare **(Majority Recommendation).**

Benefits: Funding would allow the Department to implement PM 2.5 NAAQS.

Transportation Subcommittee Recommendations

The subcommittee met four times. It was tasked with 14 brainstorming ideas. Seven recommendations were presented to the workgroup. Garret Pederson was the chair. More information on the subcommittee is at http://www.iowadnr.gov/air/prof/meet_wg/pm25/t_sub.html. The subcommittee members are listed below.

Company	**Representative**
INRCOG	Kevin Blanshan
Linn County Public Health - Air Quality Division	Shane Dodge
Waste Management	Debra McDonald
Iowa Renewable Fuels Association	Grant Menke
Iowa Association of Business & Industry	Nicole Molt
Iowa County Engineers Association	Cathy Nicholas
Iowa Department of Transportation	Garrett Pedersen
East Central Intergovernmental Association	Chandra Ravada
DNR - Field Services	Joe Sanfilippo
Iowa Environmental Council	Leland Searles
Des Moines Area Metropolitan Planning Organization	Bethany Wilcoxon

DNR Technical Support Staff: Matthew Johnson

(The following recommendations have been prioritized by the Subcommittee, with recommendation number one representing the highest priority.)

1. Quantification of impacts from mobiles sources &assure that transportation is fairly reflected according to its contribution in any corrective actions.

1a) Given that there are uncertainties about the quantities of precursor emissions that are converted to secondary PM2.5, as well as the atmospheric chemistry of conversion for NOx and VOCs, the subcommittee recommendation G1A that additional study of primary and secondary PM2.5 and precursor emissions that result from transportation in light of (1) forthcoming Corporate Average Fuel Economy (CAFE) standards that target vehicle manufacturers, (2) the likelihood that the new standards will reduce PM2.5 to an as-yet unknown extent, and (3) the possibility that further research may shed light on the proportion of precursors that are converted to PM2.5 under certain conditions **(Majority Recommendation)**.

1b) The subcommittee further recommends in G1B that the Department collaborate with other state agencies and local governments responsible for transportation planning and design in order to reduce PM2.5 emissions and formation from vehicle traffic **(Majority Recommendation).**

2. Differences between urban and rural PM2.5 levels that can be attributed to on-road sources.

2a) Given that the contribution of on-road sources to ambient PM2.5 concentration (both in total ug/m3 and as a percentage of the total) is different in urban and rural environments, the subcommittee recommendation G2A that any future corrective measures be formulated and applied in such a manner so as to avoid disproportionately burdening the transportation activities in the urban and rural areas of the state **(Split Decision (6-6)).**

2b) The subcommittee further recommends in G2B that additional study be conducted on the contribution of on-road sources to secondary organic aerosols, both in urban and rural environments **(Majority Recommendation).**

3. Air quality expertise on the Technical Advisory Committees of Iowa's Metropolitan Planning Organizations (MPOs).

The subcommittee recommendation G3 that all nine existing Technical Advisory Committees to MPOs in Iowa consider adding an advisor and/or representative who is knowledgeable about air quality issues. Such expertise needs to include transportation-related PM2.5 but should not be limited to this pollutant or to this major emissions category.
The subcommittee also lauds those MPOs that already have or currently are planning to include such expertise in their deliberations **(Majority Recommendation).**

4. Responsibility for emissions modeling with MOVES & PM2.5 modeling integration with Travel Demand Modeling.

The subcommittee recommendation G4 that MOVES modeling be studied in more detail to determine the appropriate roles for all interested agencies, including the Department, DOT, and the affected local planning agencies. Exploration of other states' practices should be part of this study. The subcommittee further recommends that training be made available for MOVES modeling and for application of results to transportation issues, including but not limited to reductions under a nonattainment finding **(Majority Recommendation).**

5. Effects of increased biofuels usage on PM2.5 emissions.

The subcommittee recommends in G5 that additional study be conducted on the production and combustion of biofuels and the impacts on PM2.5 levels, and then weigh possible legislation if results indicate the need for a change in current biofuels usage **(Majority Recommendation).**

6. State vehicle inspections & maintenance.

The subcommittee recommends in G6 additional study of other states' inspection and maintenance programs, notably California. The study should consider when and why such programs have been ended in the recent past, and what programs have been started or reinstated in the recent past and why. There is no policy recommendation, in light of the unpopularity of these programs and in light of the fact that many are driven by federal standards for ozone (and other pollutants) and consequent nonattainment findings **(Minority Recommendation).**

General recommendation: Legislative appropriations

Several recommendations from the Transportation Subcommittee will require funding for staff and equipment to carry out additional studies in order to increase understanding of pollutants, source sectors, and monitoring/modeling. We further recommend in G7 that the Iowa Legislative Assembly, after consideration of the priorities created by this Subcommittee, move to make necessary appropriations for the DNR's Air Quality Bureau to carry out these studies and other recommended actions **(Majority Recommendation).**

DEFERRAL OF ACTION

Gravel Road Contributions to PM2.5, Gravel Road Dust Control, & Fugitive Dust from Roads

The subcommittee defers these items as low-priority concerns for the control of PM2.5. This deferment is based on the suggestion that gravel dust is a greater concern for the PM10 fraction. Some study of cost-effective dust control that is environmentally safe and considers localized health effects seems reasonable, but these are outside the scope of the subcommittee's work and quite possibly outside the mandate of the PM2.5 workgroup.

Road sanding & salting in winter

The subcommittee defers this item as low-priority for the control of PM2.5. This deferment is based on the suggestion that sanding and salting does not constitute a significant source of PM2.5. It is likely that regulation under other areas, such as water quality, will lead to reductions of PM2.5. The Department need not consider this source sector in implementing a PM2.5 program.

Impact of PM2.5-related regulation of vehicle fleets

The subcommittee supports the state's current approach to fleet regulation and defers these items given that the CAFE standards for automakers, along with heavy-duty engine regulations, seem to be the accepted means for controlling mobile emissions, including those from vehicle fleets.

TRANSFER

State anti-idling legislation

The Transportation subcommittee proposed a transfer of this item to the Policy/Government Relations subcommittee. The proposed transfer was accepted.

Section IV: Individual and Organizational Comments

Department analysis of recommendations and comments submitted by individuals and organizations regarding PM2.5 implementation are provided below. The comments and analysis are in alphabetical order by individuals and organizations. The full text of the submitted comments follow the Department's analysis.

Citizens of Linn County (Jackie Moore, Harold Hensel & Kay Lammers) (11/4 – 11/8)

The Department sympathizes with the concerns relating to outdoor wood boilers, fire pits, and illegal burning. There are no plans to regulate outdoor wood boilers and fire pits on a statewide basis at this time. The Department believes that decisions regarding the location, configuration, and operating restrictions of this type of equipment are best left up to local jurisdictions to allow for solutions that are appropriate for the scope of the problem in each area.

The Department and the local programs in Linn and Polk Counties, enforce the current open burning regulations with limited resources. Any additional enforcement would require additional resources.

The Department plans to conduct an educational campaign, contingent on the availability of resources, to educate owners on the proper use of fireplaces, wood stoves, and outdoor wood boilers. Proper operation and maintenance of this equipment will help reduce the amount of PM2.5 emitted.

Iowa Association of Business & Industry (11/22)

The Department appreciates ABI's comment that the PM2.5 workgroup process provided "The opportunity for ABI members to sit at the table, comment, and provide expertise to DNR.." and that this process "… is an example of the public-private partnership ABI members seek to have with all regulators." ABI also indicated that too much time and resources were spent in the process. The Department opted for more time being devoted to this topic given the concerns regarding PM2.5 implementation expressed by industry and groups such as ABI. The Department will take this comment into consideration when planning future workgroups.

ABI indicated that Department staff discouraged any suggestions of change in the status quo. The Department believes that this assessment is not accurate and fails to recognize that in many key instances, a majority of workgroup members chose to maintain a status quo that they were charged with developing recommendations to address. Notable instances include recommendations for the continued use of the PM10 surrogate policy, recommendations of no new state emission limits for PM2.5, and no new regulation of agricultural sources.

The Department is always receptive and interested in new ideas or suggestions, especially those regarding modifying current processes. The department has been and continues to be a leader in state government for process improvements, including Kaizen events, and strives daily to make decisions that are based on the best available data and analysis of these data. The role of Department staff during the workgroup was to provide clarification of the requirements and limitations under the federal Clean Air Act and current state statute. The desire to look "outside the box" must be balanced with the need to develop plans and programs that will comply with state and federal laws and requirements and aid in accomplishing the primary objective of implementing the PM2.5 NAAQS.

ABI suggested that future workgroup efforts should be facilitated by an outside person. The Department believes that this is a valid recommendation for future the workgroup meetings if resources are made available to provide for a facilitator. In this instance, many of the detailed policy and technical discussions occurred during the subcommittee meetings. Given the number of subcommittee meetings it would have been unrealistic to have an outside facilitator available at each subcommittee meeting. However, an outside facilitator for the monthly workgroup meetings may have aided both the Department and workgroup members in having more balanced and informative discussions.

ABI differs with the Department on the use of dispersion modeling. Federal and state laws and regulations require a demonstration that a proposed project will not cause or contribute to an air quality problem once it is constructed and begins operation. This demonstration must be accomplished through modeling if state emission standards are not stringent enough to ensure adequate protection of the ambient air quality standards. The workgroup recommended, with ABI's support, not to strengthen the particulate emission standards to be protective of the PM2.5 ambient air quality standard.

For PM2.5 specifically, the modeling survey, in Appendix V, conducted by the workgroup indicates that many states are planning to use modeling to some degree for construction permitting related analyses. ABI's concerns regarding whether it is premature to require PM2.5 modeling are mitigated by the fact that a permitting program for PM2.5 will not be implemented until January 1, 2012. Increased benefits to public health and welfare protection will occur when projects are permitted in a manner that is protective of the PM2.5 NAAQS.

Iowa Environmental Council (11/22)

The Department appreciates the significant literature review and documentation provided by the IEC regarding PM2.5 precursors and agricultural sources. The IEC states in their comments that they would like to see a wider installation and maintenance of ammonia emissions control practices that can make improvements in air and water quality. A more precise approach typically employed in the mediation of air quality problems is to identify the primary source contributors and then implement measures that will make proportional reductions in their emissions contributions to the air quality problem. The Department believes that a similar approach could also be applied in the future to agricultural sources of ammonia.

The Department does not plan to proceed with regulating air emissions from agricultural sources at this time. The National Air Emissions Monitoring (NAEM) study has concluded its data collection phase. The next phase is for EPA to develop the emission estimation methodologies, which are scheduled to be finalized by November 2011. It would be duplicative and resource intensive for the Department to develop its own methodologies at the same time as EPA. The Department will monitor the activities and will review and comment on proposed EPA regulations as appropriate. In the mean time, the Department will expand education and outreach to the agricultural sector, as resources allow, in an effort to affect increased voluntary application of best management practices that will reduce ammonia emissions.

Sierra Club- Iowa Chapter (11/7/10)

The Department concurs with Sierra Club that the PM2.5 NAAQS should be implemented expeditiously while allowing industry appropriate time to implement the needed changes. Using January 2012 as the start for implementation of PM2.5 in the state air quality program will allow all parties to adapt to the changing regulations and provide business and industry with time to

evaluate the impacts of PM2.5 implementation on their operations and factor it into their business plans.

The workgroup recommended that the Department continue using PM10 as a surrogate for PM2.5 until promulgation of a stack test methodology by EPA for PM2.5. The workgroup recommended that the Department then convene a workgroup to discuss future PM2.5 modeling policy. EPA revised two test methods for measuring particulate matter emissions from stationary sources on December 1, 2010. The Department will use preliminary ideas provided by the workgroup as a starting point and consult with interested stakeholders before finalizing revisions to the existing process to include factors for determining what evaluations of PM2.5 impacts may be needed during the permit application review. The Department plans to discontinue use of the PM10 surrogate policy for non-PSD projects by January 1, 2012.

The Department understands Sierra Club's intent with including adverse environmental and public health impacts of not regulating PM2.5 into SIPs (see workgroup recommendation F1). As indicated in the response to the workgroup recommendations, the Department will include information provided by EPA and other sources.

While the Department shares Sierra Club's concerns on high background levels it should be recognized that Iowa already has one of the most well articulated PM2.5 ambient air monitoring networks in the country. Additionally, it is impractical and cost prohibitive to install a monitor in every county in the State. The Department will be requesting additional state funding to help ensure continued operation of the existing PM2.5 monitoring network to offset expected decreases in federal grant funding of PM2.5 monitoring in the near future.

The Department will be conducting an education campaign, if resources are provided, on the proper use of fireplaces, wood stoves, and outdoor wood boilers. Discouraging the burning of green or uncured wood could be included in such a campaign. The Department welcomes any independent outreach that Sierra Club or other partners are able to provide on the topic.

The Department is committed to working with all partners to provide adequate funding for air quality activities. While the public benefits from clean air, the public also contributes to air quality problems on a scale much greater than permittees when emissions resulting from personal choices regarding motor vehicle selection and use are collectively considered. State funding for air quality programs has remained stagnant and even declined in some instances despite the increasing stringency of the air quality standards and increased ambient air monitoring requirements. An increased share of the funding for air quality programs should come from the state based on consideration of these issues.

The topic of construction permit fees has been discussed on and off for several years with interested stakeholders. The increased regulatory burden will force the topic to be dealt with in the short-term in order for the Department to continue meeting its existing regulatory obligations and program delegations with EPA.

The Department will further evaluate the need to regulate ammonia emissions from the agricultural sector after emissions estimating methodologies have been developed by EPA from data collected during the National Air Emissions Monitoring (NAEM) study. It would be duplicative and resource intensive for the Department to develop its own methodologies at the same time as EPA. The Department will monitor the activities and will review and comment on proposed EPA regulations as appropriate. The Department concurs with the need to update

publications such as “Practices to Reduce Ammonia Emissions from Livestock Operations”. Additional resources will be needed to update such publications.

Concerns were expressed by Sierra Club on the recommendations from the Area Source subcommittee. The recommendations met the procedural criteria established by the Department for presenting recommendations to the full workgroup and were approved by the workgroup as applicable.

The Department continually monitors EPA’s rules and guidance on all pollutants. Emission testing of vehicles is typically only instituted in areas that have been designated as nonattainment for a particular air pollutant. Where applied, such programs have been historically unpopular and costly to implement and the effectiveness of such programs in reducing air pollution is often unknown. Vehicle emission testing also raises environmental justice concerns in that it may disproportionally effect segments of the population that cannot afford to upgrade their vehicles. Using a “Cash for Clunkers” approach could incentivize Iowans to address emissions from older vehicles.

The Department plans to evaluate the provisions and conditions of permits by rule, and construction permit templates, to ensure that they are protective of the PM2.5 standard. This approach will likely result better tools for the Department and affected stakeholders and should also ultimately result in better compliance with the conditions and provisions of these tools.

Dr. Charles Stanier/U of Iowa (without the references attached) (11/22)

The Department appreciates Dr. Charles Stanier’s research and looks forward to reviewing the results of future studies. Such research is invaluable and should be continued. The Department does not anticipate adopting regulations relating to ammonia emissions from the agricultural sector until the NAEM study is released. The Department concurs that education to the agricultural community on best management practices, including practices to reduce excess nitrogen application, is an excellent current path. The Department will continue to participate in multi-state workgroups on ammonia and will participate workgroups on multi-pollutant or multi-media approaches involving ammonia as opportunities arise and resources allow.

Walker, Wendy [DNR]

From: Harold Hensel [mhhensel@earthlink.net]
Sent: Thursday, November 04, 2010 12:58 PM
To: Walker, Wendy [DNR]
Cc: mhhensel
Subject: Stakeholder committee recommendations

EPA

"Chapter l03:FUEL BURNING EQUIPMENT PARTICULATE EMISSION STANDARD

SUMMARY: This regulation establishes a limitation on the amount of particulate matter allowed to be emitted from fuel-burning equipment. The amount of particulate matter permitted is dependent on the type of fuel being burned and whether or not the source is new or existing.

Any biomass boiler, so called, designed to burn wood, bark, coal, sludge, petroleum product or other such combustible fuel, alone or in combination, ... shall not exceed 0.06 lbs. particulate per million BTU when burning the primary fuel, or fuel combinations within the range of design rate proportions.""

Please include the 0.06 lbs. particulate per million BTU standard in the Linn County Code and include it in the stakeholders committee recommendations.

Since this is an EPA requirement, I don't see how it can be excluded. Also, recommend that this standard is enforced on an individual basis and applies specifically to Outdoor Woodburning Boilers or any other source of pollution from burning.

Please maintain the 2.5 particulate matter rule for regulation and do not go to 10.0. Actually, 90% of the harmful gases and particulate matter occur under 2.5 ppm. This standard should be reduced not raised.

Please refer to the medical section of Burning Issues. This explains the health issues related to wood and other burning. Please include this list in the public comments as well as the science section. http://burningissues.org/car-www/medical_effects/index.html

Walker, Wendy [DNR]

From: Kay LAMMERS [kaylammers@msn.com]
Sent: Sunday, November 07, 2010 3:06 PM
To: Walker, Wendy [DNR]
Cc: mhhensel
Subject: OWB

Ms. Walker,

I have been on the Marion council for 15 years and the past 3 as Mayor Pro Tem. I have tried to outlaw all fire pits but to no avail. The younger men on the dais with me all have them and think they are great and even let their children play in the fire!! These fires have no practical use what so ever except adding to our already bad air pollution.

The city of Marion is now trying to deal with OWB's. These smoke belching burners will continue to add pollutants to the air. At this point, the city has a moratorium until May 1, 2011, with 3 exceptions, already existing burners, the EPA's Phase two compliance and that it is regulated by a computer and they can be manufactured in Marion.

This does not give me comfort. I won't repeat all of the health problems these can cause but we have a gentlemen that lives next to a school playground that would love to build one. These do not belong in close residential areas, but that will be a local decision. I would certainly agree that there is a need for OWB'S in rural areas that do not have access to natural gas. With all of our "green" technology I see no need to encourage any code that would relax in any way the amount of particles that can be allowed into the atmosphere. The health and welfare of Iowans depends on leaders who can stand up and say "we will see that the people of Iowa have clean air to breathe". I hope the DNR has the courage to do so.

Respectfully,

Kay Lammers
2820 Second Avenue
Marion, IA 52302

Walker, Wendy [DNR]

From: Jane Doe [jm.fccj@yahoo.com]
Sent: Saturday, November 06, 2010 1:39 PM
To: Walker, Wendy [DNR]
Subject: outdoor woodboilers located next to jackie moore's home

Wendy,DNR committee, I was told I could e-mail you with concerns I have with outdoor wood boilers here in Linn County,so I will try and tell you in this letter what I am experiencing and what I have gone through with OWB's ..My name is Jackie Moore I live at 1649 Bloomington Rd. Mt.Vernon, Iowa 52314 Bertram Township-Linn County.These OWB's are a piece of equipment that looks like a small shed and are fueled by wood or there are corn burning units also.These OWB are usually fed by wood.These stoves can burn 24/7 all year-the reason why is owner's use them to heat their homes and also heat their water.They do not have to hook up both but some owners are-remember 24/ 7 all day,all night,all year round.But here's the problem the emmission from these OWB are emmense especially when being fired up with wood and it lasts a long time and then a constant stinch of smoke and fumes linger in the air and keeps smoldering all day and night.Smolders like a campfire burning and only Mother Nature can take it away or on the other hand Mother Nature can be your worst enemy if blowing towards a neighbor's home and yard.I live in a rural area which consists of a variety of acreages with mixed zoning.These are nice homes and I have lived at my home over 30 years and now my new neighbor has set an OWB 15 ft. from my property line or fence line which runs at an angle.I have experienced receiving the emmission from that OWB on a daily and night basis all year,I get it because the wind blows just right and I have skipped to different parts of my own yard to avoid it-no one stands in the direction of the smoke from a campfire when it's burning-so this is what a neighbor has to do to survive living next door to one or even in their neighborhood.The emmission does not even have to be a great deal it's just the stinch of a constant campfire fumey smell blowing onto your own property and invading your home.This is a violation of a person's ambient air quality and this is against the law.We all have a Constitutional Right to breathe clean air and a piece of equipment should not take this away from neighbors.I don't open my windows on the South side anymore.Some owners even use a chemical in their stoves to keep the creosate from building up in their stacks and stoves.My neighbor according to the Linn County proposal that is in effect right now can burn all year 24/7 day and night because he's zoned Agriculture and he does not even have an acrea of land.I have 3 acreas and I'm zoned Residential.The zoning is mixed and this happened a while back when the county allowed zoning to be changed-this is a problem within itself-this is why no regulations should have been set by zoning when we have a mixture like this throughout the county and especially when dealing with such an important subject as OWB'S .These stoves need proper distance between neighbors,the location for an OWB should be suitable for all and limitation of stoves in an area.This was brought up to the Health Dept. and the Board of Supervisors of Linn County.I have filed a nuissance clause with Linn County against my neighbor and I have sent pictures to Brian Hutchins DNR and have had conversations with him,I have also sent you Wendy some pictures also of the stoves in my neighborhood they will have an address of Cornell College Mt.Vernon on them but they are mine-I just mailed them from Cornell.But I feel a nuissance clause consists of officials compromisng with the owner over and over again and me being a constant watch dog and constantly calling officials over and over.What I finally got from this is a 20 ft. stack which still doesn't help,being that close it won't.Stacks only raise the emmission and pollutants-mother nature is still depended on to take it away,there is downdrafting,weather is crazy in rural areas,these stacks don't work we are too close.I have talked to a lady right in Cedar Rapids,Ia. city limits that has one in her neighborhood and she has emphazema,the health department got her a 25 ft. stack she says it helps a bit but she still gets emmission-too close,she said she hopes this is not the final solution-she can't breath this exhaust.I also need to tell you more about my neighborhood I also have an OWB across the road South of my home and one further down the road on a corner acreage.Actually were are encircled by OWBs. We have 6 in our area,3 closest to me are not EPA approved,altogether we have 8 within 1/4 mile-this is how fast these OWBS can esculate. It took only 2 years in my neighborhood to get the ones I have located close to me and I had no regulations to fall back on what a

helpless feeling. But there is the state law and we know that now and it needs to be enforced by officials.So what will our neighborhood be like for the next 20 years? These stoves I bet will last a long time.So after going to every Health Board meeting,board of Supervisors meetings,talking to Linn County Supervisors,talking to Mr. Houdina over and over about what I am experiencing and what I have heard others going thru, we have a proposal that is in affect that I am sorry to say is weaker than the state law,it has so many loopholes and does not solve all residents legitimate concerns when dealing with these OWB problems.A lot of these OWBS that are burning are illegal but they have till 2012 to either add stacks,cut down on wood and keep a chart and log on how wood fuel they use this will keep the emmission down to legal level-who is going to keep track of 200 stoves on a daily basis-this is a joke.Here we go again the neighbor becomes the watchdog and has to turn it in.A lot of these stoves that are burning are illegal because the late law requires particulate matter at 2.5-35 microms over a 24 hr. period and a lot of stoves exceed this but they are being grandfathered in and I have 3 right next to me in my neighborhood. Also Linn County is violating the NATIONAL AMBIENT AIR QUALITY STANDARDS because they are only covering particulate matter and leaving out 5 other pollutants.Also they are trying to cover ambient air quality from county line to county line and ambient air starts at my property line not the county line and that is why I want the 0.06 lbs. particulate per million BTU standard added into the Linn county code.Owners of these OWBS seem to have all the controll it seems is all a neighbor gets is to file a nuissance complaint and I've been going thru this- not much fun.It seems a neighbor becomes a silent victim it can happen in no time,it totally changes your quality of living,you just want it to be the way it use to be.Remember these OWBS need proper distance,location and limitation I don,t see any way around it and I believe Linn County's proposal doesn't meet these needs and we need help from the DNR and EPA to get this OWB issue resolved. thank you

Walker, Wendy [DNR]

From: Harold Hensel [mhhensel@earthlink.net]
Sent: Monday, November 08, 2010 11:43 AM
To: Walker, Wendy [DNR]
Cc: mhhensel
Subject: Additional comments

Hi Wendy,

This is probably too late but Jackie Moore wanted to add three points that need to be addressed.

1: Controlling illegal burning. Is that possible? Illegal burning goes on at night.

2. Fire hazards.

3. Proper distances and number of woodburning boilers in one area. It's difficult to get woodburning far enough away without damaging the health and well being of neighbors.

Harold Hensel
on behalf of Jackie Moore.
206 Collins Rd NE
Cedar Rapids, Iowa 52402
mhhensel@earthlink.net

IOWA ASSOCIATION OF
BUSINESS AND INDUSTRY

The Voice of Iowa Business Since 1903.

November 22, 2010

Ms.Catharine Fitzsimmons
Bureau Chief, Air Quality Bureau
Iowa Department of Natural Resources
7900 Hickman Road
Windsor Heights, IA 50324

Dear Catharine,

On behalf of the 1,400 member companies of the Iowa Association of Business and Industry (ABI), thank you for including ABI in the recent PM2.5 workgroup implementation process. ABI members employ over 300,000 Iowans and the decisions made by the Iowa DNR directly impacts the employees and the companies who employ them. The opportunity for ABI members to sit at the table, comment and provide expertise to DNR is an example of the public-private partnership ABI members seek to have with all regulators. ABI members appreciate being involved in the process in order to provide increased transparency and the opportunity to express opinions, share technical expertise, and educate the DNR about the impact any proposed regulations would have on the regulated community and economic development. ABI members would like DNR to consider the comments below when developing future workgroups.

1) **Time.** Many ideas were developed from the workgroup meetings. However, ABI members, like DNR employees, have many responsibilities within individual companies. Also, like the DNR, many companies have had substantial cutbacks and are doing more with less. The workgroup process required representatives of companies to serve on smaller groups and participate in the full workgroup in order to have input to final recommendations. In addition to the private sector resources provided during this work group; DNR also had multiple staff members who were engaged in the full workgroup meetings and others running the smaller workgroups. Given reduced resources for both parties, an evaluation of the existing process to make it more efficient and less time consuming would be beneficial. Many ABI member companies have well documented and supported ideas of how best to address the PM 2.5 issue and are willing to share those with DNR.

2) **Input.** The purpose of the stakeholder meetings was to receive input from all interested parties to ensure Iowa has a process for PM2.5 evaluation and permitting based on sound science and data that protects public health while considering the economic impact to affected stakeholders. Several times at each full workgroup meeting, DNR staff requested the smaller subgroups reconsider the recommendation due to the perceived impracticality of DNR being able to implement the recommendation under current conditions. The intent for a stakeholder group is for varying interests to work together to come up with a solution that may or may not fit in with "business as usual" at the DNR. Solutions could include changing the current process at DNR. Unfortunately, DNR staff discouraged any suggestions of

904 Walnut Street, Suite 100 | Des Moines, IA 50309-3503 | 515.280.8000 800.383.4224 | Fax 515.282.8085 | www.iowaabi.org

change in the status quo. ABI members were very disappointed in the DNR response to new ideas or suggestions on modifying the current processes. ABI suggests one way to curb this type of situation from arising again is to have an outside person facilitate the process. A facilitator would help keep the workgroup on track, facilitate discussion between DNR and stakeholders, and ultimately help reduce the resources needed because of their ability to keep the process moving forward.

3) **DNR's position on modeling and monitoring**. ABI members have a philosophical difference with the DNR when it comes to the decision to require that modeling be conducted prior to permit issuance for minor New Source Review projects. The existing approach assumes facilities are guilty until they prove attainment via a worst case estimation of ambient air quality impacts through an imperfect tool. Iowa's neighbor to the east, Illinois, generally assumes existing rules and emission standards are protective of the NAAQS and limits the use of modeling to major NSR projects and limited special cases. Other states as well do not use modeling to prove attainment prior to permit issuance unless required by the EPA. ABI believes DNR should not model for PM2.5 other than required by federal rules. Modeling for PM2.5 is premature and the DNR has not shown that any increased benefits in public health or protection of Iowa's resources would occur.

ABI members hope you will consider the comments above and share with others within your agency that may benefit from this feedback for future workgroups. Thank you again for the opportunity for ABI members to participate in the PM2.5 workgroup process. ABI members look forward to receiving and reviewing the final product and working with the DNR to finalize an acceptable solution to PM2.5 implementation.

Respectfully submitted,

Nicole L. Molt

Nicole Molt
Director, Government Relations

Iowa Environmental Council

521 East Locust Street, Suite 220
Des Moines, Iowa 50309-1939
515.244.1194 phone
515.244.7856 fax
iecmail@iaenvironment.org
www.iaenvironment.org

November 22, 2010

Catharine Fitzsimmons, Chief
Air Quality Bureau
Iowa Dept. of Natural Resources
7900 Hickman Rd., Suite 1
Windsor Heights, IA 50324

Dear Catharine:

In follow-up to the DNR's workgroup this year for implementation of $PM_{2.5}$ standards, I submit this letter as public follow-up to the Iowa Environmental Council's participation on the On-the-Books/Precursors/Transport Subcommittee. Most of what follows consists of research on the role of ammonia emissions from agricultural sources, and there are recommendations herein for the Air Quality Bureau's consideration as it compiles its reports for the Iowa Legislative Assembly and the Governor's Office.

The stakeholder process that was implemented under House File 2418 proved worthwhile, in the Council's opinion, in bringing together disparate interests to talk about the various issues in atmospheric chemistry, emissions inventory, interstate transport, modeling and monitoring, and source sector applicability. We look forward to development of permitting programs and other forms of implementation that bear in mind the environmental and health costs of $PM_{2.5}$ pollution and the benefits from reducing concentrations of this pollutant, along with the needs of regulated industries.

The comments below largely concern agricultural sources. This should not be read by the DNR or any other entity to mean that the Council has an anti-farming agenda. Indeed, we believe that agriculture is central to the state's economy. The Council is concerned that farming practices reflect good scientific conclusions, that they account for the needs of Iowans whose health, recreational, and other lifestyle opportunities are impacted, and that agricultural pollutants receive greater attention and more efficacious solutions than they do at present.

Prioritization of $PM_{2.5}$ precursor compounds

As regulated industries face even more exacting NAAQS and permitting limits for direct $PM_{2.5}$ and precursors such as sulfur dioxide and NOx, the relatively unregulated sources of ammonia (NH_3) are increasing in importance as chemical precursors of ammonium nitrate (NH_4NO_3) and ammonium sulfate ($(NH_4)2SO_4S$ particles. Several agency reports have drawn attention to this issue (Iowa DNR 2004, 2006, 2008; NADP 2000), and EPA has coordinated with commodity groups and university researchers to further develop the understanding of ammonia's impact in the National Air Emissions Monitoring Study (NAEMS; see https://engineering.purdue.edu/~odor/NAEMS/). The United Nations Food & Agriculture Organization (2006) concluded that "Major reductions in [the impact of livestock on environment] could be achieved at reasonable cost." The National Academy

of Sciences reported data that show animals and agricultural land as the leading global and US sources of ammonia, in descending order (Ad Hoc Committee 2003).

This finding is well supported by National Emissions Inventory data that were included in a DNR presentation (Page 2010). Dr. Charles Stanier's work with the Lake Michigan Air Directors' Consortium (LADCO) data on wintertime episodes of high ammonium nitrate concentrations (Baek et al. 2010, Stanier 2009) quite clearly shows that (1) agricultural sources need to join currently permitted NAAQS facilities in some proportioned response, whether through regulation or stepped-up voluntary efforts; and (2) adoption of ammonia air emissions controls are likely to have some effect on downwind concentrations. Earlier, Erisman and Schaap (2004) had indicated the need to reduce ammonia releases in relation to European secondary $PM_{2.5}$ formation, a conclusion based on findings that are strikingly aligned with the results from Stanier and colleagues.

At present NH_3 is given very low priority as a $PM_{2.5}$ precursor and pollutant, largely for fear that any attempt to control it will impose financial hardships on Iowa's agricultural and rural economies. It is the opinion of the Council that the DNR should explore whether it should be a "presumed precursor," given its importance in the formation of ammonium nitrate and ammonium sulfate, and given that the other two components in these aerosols already are "presumed precursors." The results of the Stanier Group's work with the LADCO winter nitrate study, cited above, strongly indicate the need to consider ammonia as a key variable in these episodes of high $PM_{2.5}$.

Ammonia emissions modeling & monitoring

A substantial literature that provides rationales for monitoring and modeling of ammonia currently exists. This area is not within the technical expertise of the Iowa Environmental Council. However, we recognize that there are complex factors in estimating emissions. The current IMPROVE monitor network, intended largely for regional haze, provides a relatively good sense of ammonia concentrations over the Upper Midwest. In addition several projects that were conducted by the Iowa DNR have assisted in understanding emissions, dispersion, and models.

Of note are these selected literature sources:

- A CENRAP ammonia emissions report (Coe & Reid 2003) that includes a wide variety of sources from crop fertilizers and livestock species.
- Modeling techniques to distinguish natural landscapes and fertilized soils (Battye & Barrows 2004)
- Emissions from livestock facilities (Pedersen et al. 2004), including broiler housing (Gates et al. 2008), waste storage and treatment (Aneja, Chauhan & Walker 2000), and liquid dairy manure application (Leytem et al. 2009)

Emissions controls of NH_3

The need for better control of NH_3 as a $PM_{2.5}$ precursor is supported by the general literature on $PM_{2.5}$ as a health hazard, as well as specific analyses (for example, ATSDR 2004, Osterberg and Wallinga 2004, Sigurdarson & Kline 2006, Wing & Wolf 2000). In addition, ammonia and co-pollutants have direct and indirect health and environmental consequences. While conversion of NH_3 to the ammonium nitrate aerosol form occurs at unknown flux rates, that such conversion takes place is undisputed. European researchers estimate that 50% or more of secondary $PM_{2.5}$ comes from the chemical reaction of NH_3 with NOx (after its conversion to nitric acid, itself problematic) and SO_2 (Oenema et al. 2007). Further, NH_4NO_3 deposits to the surface in currently unestablished amounts, exacerbating nutrient loading in surface waters of the state (see Stensland, Bowersox & Claybrooke n.d.). Thus there are two points in this process that warrant additional research: atmospheric chemical conversion of emitted ammonia to NH_4NO_3, and deposition of NH_4NO_3 to

the surface. Also this speaks to a likely need for the DNR's Environmental Services bureaus, researchers, and others to coordinate efforts because of the air-to-water links.

Despite views expressed in the On-the-Books Subcommittee to the contrary, there are several agricultural best practices that are known to reduce ammonia and other pollutants significantly, and studies of their effectiveness and costs have been done (Burns 2007; ISU Extension 2004; Joint CAFO Study Group 2002; McCubbin et al. 2002; LADCO 2007; Pinder, Adams, & Pandis 2007;Reynolds n.d.). Research on manure incorporation in soil has shown that several techniques are effective, including two techniques that were studied at the USDA's Agricultural Research Service station in Kimberly, ID (cited in the *Iowa Farm Bureau Spokesman*, Oct. 27, 2010, p. 12). Several single-pollutant and multi-pollutant biofiltration systems are known to cut air emissions of direct $PM_{2.5}$ and NH_3 from swine housing (Burns & Xin 2009, ISU Extension 2004), and entrepreneurs in Illinois are taking advantage of this research as an economic opportunity to market filtration systems. Better control of swine feed inputs will reduce overall N levels in manure, with lessened impacts for air and water (Sutton 2008). Methods for reducing NH_3 emissions from poultry litter have been studied (Moore 2010).

Research and analysis for the European Commission (Oenema et al. 2007; see also sources cited by Sutton 2008) indicates that closer attention to the nutrient balance of crop fertilizers (i.e., manure and anhydrous ammonia) possibly is the single most effective means of reducing atmospheric ammonia, nitrous oxide (N_2O, a greenhouse gas), and nitrate (NO_3) in surface waters. The last result may not apply directly to the agricultural scenario of the Upper Midwest, but its results are telling: the emissions inventory for ammonia in Iowa places livestock (building ventilation, open feedlots, manure management) as the higher source of NH_3, with croplands (manure & anhydrous fertilizers, plus smaller fractions of emissions from crop residues) as a near second.

Policy considerations

A conclusion is that the DNR needs to work diligently to apply appropriate pressures, based on the state of research on atmospheric chemistry and transport, emissions, and public health, on the agricultural sector in order to step up controls of NH_3. Of note is the European Commission report's finding that direct ammonia controls have mixed results, as at least some actually increase surface water nitrate and N_2O air emissions. It would seem that the better option for control of NH_3 precursor emissions may be the control of NO_3 and its formative compounds, in relation to both manure and ammonia fertilizers. However this conclusion is tentative and direct controls of emissions are known to be effective, as cited above.

Several attempts at regulation have failed for one reason or another, such as the attempt to establish H_2S and ammonia standards in 2003. There has been no effort on the part of the Iowa Legislature to revisit this, except in the form of the odor study bill, passed in 2008. While research evidence suggests that strategies to control odors do result in reduced release of criteria pollutants and air toxics, it is worthwhile to note that several malodorous components of manure, namely indoles and phenols, are not recognized as air toxics. Questions need to be asked and answered about whether control of odors as such is more protective of environment and health than an approach that directly addresses specific pollutants. In addition the 2008 legislation violates the principle of "polluter pays" by placing a share of costs on taxpayers. One result is that this law has not been implemented; the study it provides for has not taken place, because of budgetary constraints and a political unwillingness to raise taxes for most any purpose.

Out of a sense of equity, we would like to see Iowa's agricultural interests to step forward as a regulated or self-regulated industry sector, at least to assure the wider installation and maintenance of ammonia emissions control practices that can make badly needed improvements in air and water quality. The cost of good air emissions practices and regulations should be spread across the entire agricultural sector, from the large corporations that write contracts for small producers and control

distribution and consumption patterns, to consumers who seem to want large amounts of disposable income and very cheap necessities such as food. This avoids the commonly cited problem of placing an undue burden on small farms, farm families, and family businesses.

Shih et al. (2006) point to an "integrated process model" by which all costs of production, including health and environmental costs or benefits, are included in economic analyses. This discussion paper specifically outlines $PM_{2.5}$ reduction from control of NH_3 precursor emissions, and it describes how "farm operators [can] internalize social benefits" as well as costs.

In conclusion, the research literature from Iowa, the US, and Europe indicates numerous directions that might be taken in regard to ammonia as a secondary $PM_{2.5}$ precursor and as a contributor to poor air quality and exceedance days in some locations in Iowa. The Council has indicated above several steps that the DNR might take in addressing these. We believe that these are best for all Iowans, for regulated businesses and industry sectors, and, when all is considered, for agriculture and the farming economy in Iowa.

Thank you for this opportunity to submit these additional comments.

Sincerely,

Leland M. Searles, PhD
Air Quality Program Director

Sources Cited

Ad Hoc Committee, National Academy of Sciences. (2003) "Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs." http://www.nap.edu/openbook.php?isbn=0309087058

Aneja, VP, JP Chauhan, & J Walker. (2000) Characterization of atmospheric ammonia emissions from swine waste storage and treatment lagoons. Dept. of Marine, Earth, & Atmospheric Sciences, North Carolina State Univ., Raleigh.

ATSDR (Agency for Toxic Substances & Disease Registry). (2004) Public Health Statement: Ammonia, CAS# 7664-41-7. US Dept. of Health & Human Services.

Baek, J., G. Carmichael, S. R. Lee, J. Oleson, et al. (2010) "Episodic air pollution in Wisconsin (LADCO Winter Nitrate Study) and Georgia (SEARCH Network) during January-March 2009."

Battye, W, & R Barrows. (2004) Review of ammonia emission modeling techniques for natural landscapes and fertilized soils. Report prepared under EPA Contract 68-D-02-064 for EC/R Incorporated. Chapel Hill, NC.

Burns, R. (2007) "Swine Manure Storage and Handling Practices to Minimize Odors." http://www.pork.org/filelibrary/Factsheets/Environment/Manure%20Storage%201.pdf

Burns, R, & H Xin (2009) Overview of AFO ammonia emission mitigation methods, part 1. Presented to the USDA Agricultural Air Quality Task Force.

Coe, DL, & SB Reid. (2003) Research and development of ammonia emission inventories for the Central States Regional Air Planning Association. Final report STI-902501-2241-FR, for Sonoma Technology, Inc. Petaluma, CA. http://water.epa.gov/type/watersheds/named/msbasin/hypoxia101.cfm

Erisman, JW, & M Schaap. (2004) The need for ammonia abatement with respect to secondary PM reductions in Europe. *Environmental Pollution* 129:159-163.

Gates, RS, KD Casey, EF Wheeler, H Xin, & AJ Pescatore. (2008) US broiler housing ammonia emissions inventory. *Atmospheric Environment* 42:3342-3350.

Iowa DNR (Dept. of Natural Resources). (2004) Animal feeding operations technical workgroup report on: Air emissions characterization, dispersion modeling, and best management practices. [Des Moines.]

-----. (2006) "Results of the Iowa DNR Animal Feeding Operations Odor Study." http://www.iowadnr.gov/air/afo/files/Odor.pdf http://www.iowadnr.gov/air/afo/files/odor_measurement.pdf

-----. (2008) Animal feeding operations field study: Hydrogen sulfide and ammonia results: Executive summary. [Des Moines:] Ambient Air Monitoring Group, Air Quality Bureau. http://www.iowadnr.gov/air/prof/monitor/files/Executive_Summary.pdf

ISU Extension. (2004) "Practices to Reduce Ammonia Emissions from Livestock Operations." http://www.extension.iastate.edu/Publications/PM1971a.pdf

Joint CAFO Study Group. (2002) Iowa concentrated animal feeding operations air quality study: Final report. Ames & Iowa City: Iowa State University & University of Iowa. http://www.public-health.uiowa.edu/ehsrc/CAFOstudy.htm

Leytem, AB, DL Bjorneberg, RE Sheffield, & ME de Haro Marti. (2009) On-farm evaluation of liquid dairy manure application methods to reduce ammonia losses. *The Professional Animal Scientist* 25:93-98.

LADCO (Lake Michigan Air Directors Consortium). (2007) Source category: Agricultural emissions of ammonia. Interim white paper, November 15. http://www.ladco.org/reports/control/white_papers/Ammonia_LADCO_030308.pdf

McCubbin, DR, BJ Apelberg, S Roe, & F Divita Jr. (2002) Livestock ammonia management and particulate-related health benefits. *Environmental Science & Technology* 36:1141-1146.

Moore, P. (2010) Reducing ammonia emissions from poultry litter. Presented to the USDA Agricultural Air Quality Task Force, March 9.

National Atmospheric Deposition Program (2000) "Nitrogen in the Nation's Rain." http://nadp.sws.uiuc.edu/lib/brochures/nitrogen.pdf

Newkirk, N, & P Thorne. (2009) Study compares air pollutants in swine hoops, conventional facilities. *Leopold Letter* 21(4) (Winter 2009-2010). Ames: Leopold Center for Sustainable Agriculture, Iowa State University.

Oenema, O, DA Oudendag, HP Witzke, GJ Monteny, et al. (2007) Integrated measures in agriculture to reduce ammonia emissions: Final summary report. Wageningen, The Netherlands: Wageningen University & Research Centre.

Osterberg, D, & D Wallinga. (2004) Addressing externalities from swine production to reduce public health and environmental impacts. *American Journal of Public Health* 94:1703-1708.

Page, Nick. (2010) Emissions inventory. Presented to the Bi-State Region Air Quality Task Force, August 13.

Pedersen, S, G Monteny, H Xin, & H Takai. (2004) Progress in research into ammonia and greenhouse gas emissions from animal production facilities. *Agricultural Engineering International* 6.

Pinder, RW, PJ Adams, & SN Pandis (2007) Ammonia emission controls as a cost-effective strategy for reducing atmospheric particulate matter in the eastern United States. *Environmental Science & Technology* 41:38-386.

Reynolds, M., ed. (n.d.) "Managing livestock manure to protect environmental quality." Lincoln: University of Nebraska Extension.

Shih, J, D Burtraw, K Palmer, & J Siikamaki. (2006) Air emissions of ammonia and methane from livestock operations. *Resources for the Future* Discussion Paper 06-11.

Sigurdarson, ST, & JN Kline. (2006) School proximity to concentrated animal operations and prevalence of asthma in students. *Chest* 129:1486-1491.

Stanier, C. S., & the Stanier Group. (2009) "Understanding episodes of high airborne particulate matter in Iowa." http://www.engineering.uiowa.edu/~cs_proj/iowa_pm_project/iowa_pm.htm

Stensland, G. J., V. C. Bowersox, B. Larson, & R. D. Claybrooke (*no date*) "Comparison of ammonium in USA wet deposition to ammonia emission estimates." http://www.epa.gov/ttnchie1/conference/ei10/ammonia/stensland.pdf

Sutton, A. (2008) "Feed management practices to minimize odors from swine operations." http://www.pork.org/filelibrary/Factsheets/Environment/Feed_Mgmt_5.pdf

United Nations Food & Agriculture Org. (2006) "Livestock's Long Shadow: Environmental Issues and Options." Rome: UN FAO LEAD. http://www.fao.org/docrep/010/a0701e/a0701e00.HTM

Wing, S, & S Wolf. (2000) Intensive livestock operations, health, and quality of life among eastern North Carolina residents. *Environmental Health Perspectives* 108:233-238.

IOWA CHAPTER

November 7, 2010

Wendy Walker
DNR Air Quality Bureau
7900 Hickman Rd, Ste 1
Windsor Heights, IA 50324

STATEMENT OF THE IOWA CHAPTER OF THE SIERRA CLUB

ON

PROPOSED RULES REGULATING $PM_{2.5}$ EMISSIONS

General Statement

$PM_{2.5}$ is a serious health threat and must be effectively regulated. EPA has recognized this fact and has required Iowa to submit a plan to control $PM_{2.5}$ in 2011. EPA is also in the process of developing rules and guidance on various issues related to $PM_{2.5}$. Iowa does not need to await EPA rules and guidance, but when EPA does issue rules and guidance, they should be implemented by DNR expeditiously.

Modeling/Ambient Air Monitoring

The subcommittee has recommended that no modeling be required and that PM_{10} be used as a surrogate for $PM_{2.5}$, and that in modeling for $PM_{2.5}$, the PM_{10} modeling guide be used against PM_{10} NAAQS. We do not agree with this recommendation. It is just an attempt to avoid addressing the emissions of $PM_{2.5}$.

The subcommittee surveyed other states to determine how other states are addressing the modeling of $PM_{2.5}$ for minor sources. Of the states that responded to the survey, 8 are currently modeling for $PM_{2.5}$. Six additional states are not currently modeling for $PM_{2.5}$, but plan to do so. If other states can model for $PM_{2.5}$, we see no reason why Iowa cannot.

Nor is there any reason to use PM_{10} as a surrogate or to model against PM_{10}. According to the survey of other states, Connecticut models for $PM_{2.5}$, and does not use PM_{10} as a surrogate and models against $PM_{2.5}$. Our program can, and should, mirror Connecticut's. If Connecticut can do

3839 Merle Hay Road, Suite 280, Des Moines, Iowa, 50310. Phone: 515-277-8868; E-mail: iowa.chapter@sierraclub.org

it, there is no reason Iowa cannot. Connecticut has issued modeling guidance and NSR modeling policy and procedure related to $PM_{2.5}$. Iowa can use the Connecticut documents to establish guidance and policies and procedures for Iowa.

The survey of other states also indicated that some states use the model set forth in 40 C.F.R. Part 51, Appendix W. As an alternative to the Connecticut model, Iowa could do as some of the other states and use the federal model.

Given the high background levels of $PM_{2.5}$ in Iowa, it is imperative that we use $PM_{2.5}$ as the standard for modeling and not use PM_{10} as a surrogate or as the NAAQS.

As EPA finalizes test methods, DNR should simply incorporate those into the state rules. A workgroup to discuss future $PM_{2.5}$ modeling policy is not necessary.

Policy/Government Relations

We generally support Recommendation 1. The proposal could be a little more clear in emphasizing that the fiscal impact statement should look at environmental and public health benefits of $PM_{2.5}$ regulation and the adverse environmental and public health impacts of not regulating it.

Regarding Recommendation 2, again we generally support it. However, the stakeholder process described in the recommendation should include environmental and public health stakeholders.

Recommendation 4 should include a recommendation that the DNR acquire more monitoring equipment and install the equipment in every county to obtain accurate data. This is important given the high background levels of $PM_{2.5}$ across the state.

Although a grace period is not necessarily inappropriate, Recommendation 5 should be amended to add that if a facility is flagrantly not in compliance, enforcement action should be undertaken.

The public education program described in Recommendation 6 should include information on the adverse impacts of burning green wood in fireplaces, outdoor wood boilers, and campfires.

In Recommendation 7, we believe the funding should be shared by the public who are benefiting from clean air, and by the permittees who are causing the pollution of the air.

On the Books/Transport/Precursors

Ammonia is a problem especially related to CAFOs. We need more than education and outreach on best practices. We need regulation. Voluntary compliance has been shown to fail. Ammonia from CAFOs has

long been a serious problem in Iowa and the DNR needs to adopt strong regulation to control this problem.

Area Sources

Some of these recommendations have had some major changes since the full committee reviewed them at the last meeting. This is the only sub-committee that has made such significant changes without time for two reviews of the full committee.

Refer to our full comments that were submitted to the subcommittee.

Emission Inventory and Stack Testing

DNR needs to monitor and inventory EPA rules and guidance and implement those without delay.

Transportation

DNR should conduct a study of feasibility of emissions testing of vehicles, particularly focused on older vehicles, versus how much $PM_{2.5}$ would be prevented. Although these programs have not always been popular among certain segments of the population, you need to balance the costs of health risks and illnesses with the costs and benefits of the emissions testing. Without a detailed study, this balance is unknown.

Permitting

Regarding the second recommendation, the techniques for evaluating permits by rule should not depend on acceptance by affected stakeholders. The evaluation should be based on the facts.

Sincerely,

/s/ Wallace L. Taylor
Wallace L. Taylor, Legal Chair

/s/ Pamela Mackey Taylor
Pam Mackey Taylor, Energy Co-Chair

THE UNIVERSITY OF IOWA

COLLEGE OF ENGINEERING
Department of Chemical and Biochemical Engineering
4133 Seamans Center for the Engineering Arts and Sciences
Iowa City, Iowa 52242-1527
319-335-1400 *Fax* 319-335-1415
chemeng@engineering.uiowa.edu
www.engineering.uiowa.edu/~chemeng

November 22, 2010

Jim McGraw
Iowa Dept. of Natural Resources - Air Quality Bureau
7900 Hickman Rd Ste 1
Windsor Heights, IA 50324

SUBJECT: COMMENTS ON PM2.5 WORKING GROUP FINAL RECOMMENDATIONS

Dear Jim:

I have read through all the subcommittee recommendations of the PM2.5 working groups posted at http://www.iowadnr.gov/air/prof/meet_wg/pm25/index.html on November 20, 2010. I am sorry I was only able to attend a limited number of meetings.

My comments are as follows:

Proposed edits/changes to the Area Sources Final Recommendations

b. Cold weather/winter effects (Question 8)
Background Information: We know that cold weather PM2.5 episodes contain lots of ammonium nitrate, generated by the combination of nitric acid and ammonia in the atmosphere. Nitric acid is formed in the atmosphere from NOx, a pollutant that comes from combustion. Ammonia comes from commercial fertilizer, manure, vehicles, and wastewater. Under meteorological conditions where there is low wind, cold moist weather and temperatures between 20 and 40 degrees Fahrenheit, the reaction of ammonia and nitric acid forms ammonium nitrate PM2.5. The amount of ammonium nitrate produced is limited by the pollutant with the lowest (molar) concentration. ~~Dr. Stanier's~~Charles Stanier's presentation (assistant professor of at the Univ. of Iowa in Chemical and Biochemical Engineering) "On the LADCO Winter Nitrate Study Findings" presentation noted that, contrary to prior assumptions, it appears that fine particle nitrate formation in rural areas may be ammonia limited, rather nitric acid limited, as was previously assumed. The presentation was based on ongoing work that is now final, and is available at http://www.ladco.org/reports/rpo/monitoring/FINAL_IOWA_phase_1_report_nov11.pdf
In the final analysis (see page 6-5 for the threshold of ammonia sensitivity, pages 6-23 to 6-28 for a comparison of the new Wisconsin results to previous Lake Sugema results; and pages 8-4 to 8-6 for a summary of the sensitivity results and discussion of the impact of ongoing sulfur controls), it appears that (a) the best characterization for Eastern Iowa sensitivity during episodes is that it is balanced – either nitric acid or ammonia will reduce ammonium nitrate; (b) many sites in the region behave similarly to the study sites in Wisconsin with increased sensitivity to ammonia

during episodes; (c) Lake Sugema is likely more ammonia limited than the Wisconsin study sites (this is supported by Makar et al. 2009, Modeling the Impacts of Ammonia Emissions Reductions, Atmospheric Chemistry and Physics, 9, 7183-7212); and (d) ongoing regional reductions in SO2 will, over time, decrease the sensitivity to ammonia while increasing the sensitivity to nitric acid (and therefore NOx).

Other comments regarding the Area Sources Final Recommendations

I fully support "Recommendation #14: The subcommittee members recommend that PM2.5 precursor emissions of both NOx and ammonia be explored" and note that the first steps in this are (1) to examine the Iowa portion of the modeling domain for phase II of the LADCO project Data Analysis of the Winter Nitrate Study, and (2) see what can be learned from data analysis of the ammonia gas monitors that have run for long periods in Eastern Iowa. By using the available records for ammonia gas, ammonium, and nitrate, the sensitivity analysis that we completed for Milwaukee and Mayville, WI can be repeated for Davenport. The fact that no nitric acid measurements are available is not a problem, as the nitric acid is minimal during episodes (a finding of the LADCO WNS report) and can be calculated using a thermodynamic model.

Proposed edits/changes to the OTB/Precursors/Transport Subcommittee Recommendations

~~Dr. Stanier's~~Charles Stanier's presentation (assistant professor at the University of Iowa in Chemical and Biochemical Engineering) to the full workgroup, "On the LADCO Winter Nitrate Study Findings," indicates that ammonia, and not NOx, may be~~is~~ the limiting pollutant during some episodes during cold, moist, winter conditions. That is, ammonia occurs at sufficiently low concentrations that it restricts secondary (ammonium nitrate) PM2.5 formation. Potentially it may be controlled and regulated to good effect, as NOx currently is.

The presentation was based on ongoing work that is now final, and is available at http://www.ladco.org/reports/rpo/monitoring/FINAL_IOWA_phase_1_report_nov11.pdf
In the final analysis (see page 6-5 for the threshold of ammonia sensitivity, pages 6-23 to 6-28 for a comparison of the new Wisconsin results to previous Lake Sugema results; and pages 8-4 to 8-6 for a summary of the sensitivity results and discussion of the impact of ongoing sulfur controls), it appears that (a) the best characterization for Eastern Iowa sensitivity during episodes is that it is balanced – either nitric acid or ammonia will reduce ammonium nitrate; (b) many sites in the region behave similarly to the study sites in Wisconsin with increased sensitivity to ammonia during episodes; (c) Lake Sugema is likely more ammonia limited than the Wisconsin study sites (this is supported by Makar et al. 2009, Modeling the Impacts of Ammonia Emissions Reductions, Atmospheric Chemistry and Physics, 9, 7183-7212); and (d) ongoing regional reductions in SO2 will, over time, decrease the sensitivity to ammonia while increasing the sensitivity to nitric acid (and therefore NOx).

Recommendation 2, Brainstorm idea 1: We recommend that the DNR conduct an analysis to determine if and how ammonia should become an "assumed precursor," based on ~~Dr.~~Charles Stanier's findings, and at what emissions tonnages or rates it would trigger a PM2.5 review **(Not moved forward to full workgroup).**

Other comments to the OTB/Precursors/Transport Subcommittee Recommendations

As to the question of whether ammonia and volatile organic compounds should have the same status as SO2 and NOx as aerosol precursors, the scientific evidence for the role of ammonia as an aerosol precursor is simple, overwhelming, and not in any dispute in the peer-reviewed research. Its role is confirmed by extensive monitoring results from special studies and by long term monitoring in the CASTNET network. The work of several recent papers is an example of ammonia as a precursor (Pinder, Adams et al. 2007; Makar, Moran et al. 2009; Pitchford, Poirot et al. 2009) and of secondary organic aerosols (Donahue, Robinson et al. 2009; Hallquist, Wenger et al. 2009).

As to the role of VOCs as aerosol precursors, the scientific evidence for the role of VOCs as aerosol precursors is overwhelming and not in any dispute in the peer-reviewed research. But (unlike the case for NH_3) it is not simple due to the 1000s of precursors, the variety of sources, and their complex atmospheric chemistry. The specific contributions from different source classes, their seasonal patterns, and knowledge of the timescales and conditions for conversion from VOC to secondary organic aerosol are evolving. During summer, secondary organic aerosol and ammonium sulfate are present in similar quantities. The modeled secondary organic aerosol in CAMx and CMAQ (v 4.7) is probably accurate to within a factor of 2 in the midwest during warm seasons, and actual concentrations are almost certainly higher than the modeled concentrations due to missing chemical pathways for organic aerosol production. As to the role of VOCs as precursors during winter episodes, we found little evidence for this during the LADCO winter nitrate study (page 3-26).

With regards to ammonia control, my personal opinion is that education to the agricultural community of best practices (to reduce excess nitrogen application) is an excellent current path. I also support further research along the lines describe above. Finally, I encourage the IDNR to (if the opportunity arises) to participate in multi-state workgroups on ammonia or on multi-pollutant or multi-media approaches involving ammonia.

As Pinder et al. (2008) and Makar et al. (2009), ammonia is an important precursor in summer and winter. However, the benefits of reducing ammonia gas emissions extend (geographically) very far from the point of the reduction. Therefore, there may be trading mechanisms where Midwestern ammonia can be reduced to help solve air quality problems (and nitrogen deposition problems) far downwind. Furthermore, ammonia reductions will have local benefits in terms of air quality (during winter) and nitrogen deposition/runoff.

Pinder et al. calculate that if ammonia can be controlled for less than $8,000 a ton in winter, this is the most cost effective PM2.5 reduction (more cost effective than SO2 or NOx controls).

Figure 5 from Makar et al. shows the average PM2.5 reductions from a continent wide 30% ammonia reduction fall primarily to the east of Iowa. Makar et al. figure 3 supports my assertions above on the applicability of the LADCO winter nitrate study to eastern Iowa. Red colors indicate high ammonia availability, while green colors indicate low ammonia availability. Portions of eastern Iowa are "greener" than eastern Wisconsin in the winter panel, so the ammonia limitations we document for Wisconsin (during episodes) are likely to apply and possibly be stronger in eastern Iowa.

Please contact me if you need any additional information.

Sincerely,

Charles Stanier, P.E., Ph.D.
Assistant Professor
Chemical and Biochemical Engineering
University of Iowa
Iowa City, IA 52245
Charles-stanier@uiowa.edu
319-335-1399

References

Donahue, N. M., A. L. Robinson, et al. (2009). "Atmospheric organic particulate matter: From smoke to secondary organic aerosol." Atmospheric Environment **43**(1): 94-106.

Hallquist, M., J. C. Wenger, et al. (2009). "The formation, properties and impact of secondary organic aerosol: current and emerging issues." Atmospheric Chemistry And Physics **9**(14): 5155-5236.

Makar, P. A., M. D. Moran, et al. (2009). "Modelling the impacts of ammonia emissions reductions on North American air quality." Atmospheric Chemistry And Physics **9**(18): 7183-7212.

Pinder, R. W., P. J. Adams, et al. (2007). "Ammonia emission controls as a cost-effective strategy for reducing atmospheric particulate matter in the eastern United States." Environmental Science & Technology **41**(2): 380-386.

Pitchford, M. L., R. L. Poirot, et al. (2009). "Characterization of the Winter Midwestern Particulate Nitrate Bulge." Journal Of The Air & Waste Management Association **59**(9): 1061-1069.

Appendix I: Workgroup Charter

IOWA DEPARTMENT OF NATURAL RESOURCES

PM2.5 NAAQS IMPLEMENTATION WORKGROUP

---

1. PURPOSE

The Iowa Department of Natural Resources (Department) has created a workgroup to provide input and explore approaches for implementing the 2006 National Ambient Air Quality Standard (NAAQS) for fine particulate matter with a diameter less than or equal to 2.5 microns (PM2.5). The state must submit a plan to the U.S. Environmental Protection Agency (EPA) by spring 2011 that details how the state plans to ensure that the PM2.5 NAAQS are attained and maintained in Iowa.

The Department has requested and relied on stakeholder input in the past when implementing new air quality programs and standards. This approach has been formalized with House File 2418, which will be codified in Iowa Code 455B.134(14). Provisions of the legislation require the Department to submit a report to the Governor and General Assembly by January 1, 2011 with recommendations for controlling PM2.5 emissions, and precursors of PM2.5, to prevent exceedances of the PM2.5 NAAQS.

2. Background:

The EPA created a PM2.5 NAAQS in 1997 in order to protect public health. In 2006, EPA increased the stringency of the 24-hour PM2.5 NAAQS based on the latest public health studies and scientific data.

Particles that are less than 2.5 micrometers in diameter are easily inhaled deep into the lungs where they may accumulate, react, be cleared, or absorbed. Scientific studies have linked particle pollution, especially fine particles, with a series of significant health problems, including: increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, aggravated asthma; development of chronic bronchitis; nonfatal heart attacks; and premature death in people with heart or lung disease.

Current measurements of PM2.5 concentrations across the state indicate that even in rural areas of the state PM2.5 concentrations can be high on some days, with many locations in urban areas frequently measuring PM2.5 concentrations in excess of the PM2.5 NAAQS. The stringency of the revised PM2.5 NAAQS, combined with high monitored values statewide

means that many businesses, organizations, government bodies, and members of the general public will have to play a role in identifying reasonable approaches to regulating PM2.5 statewide.

3. Objectives and Scope of Activities:

It is anticipated that the workgroup will:

a. review the current regulatory requirements and recommend to the Department any revisions as may be appropriate;

b. advise the Department of program areas, guidance, procedures, and policies that should be updated;

c. identify additional information that is needed to implement the new standard and advise on the approaches and efforts that may be necessary to provide the required information; and

d. advise the Department of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for implementing the new standard.

It is expected that achievement of these objectives and scope of activities will provide implementation recommendations that will protect public health while fostering a stable business climate.

4. Description of Workgroup Duties:

The duties of the workgroup are solely advisory in nature and are limited to providing the Department with recommendations that will assist in the implementation of the PM2.5 NAAQS. Recommendations from the workgroup do not obligate the Department to a particular course of action.

5. Official(s) to Whom the Committee Reports:

The workgroup will submit advice and recommendations and reports to the Chief of the Air Quality Bureau of the Department.

6. Agency Responsible for Providing the Necessary Support:

The Department will be responsible for administrative support. Within Department, this support will be provided by the Air Quality Bureau (AQB).

7. Estimated Time Commitment and Meeting Attendance:

To maintain continuity all workgroup members are asked to commit to attending all workgroup meetings. A designated alternate should attend meetings that the designated primary workgroup member is unable to attend. Meetings are planned for June 9; June 23; July 8; August 5; September 2; October 7; and November 4, 2010.

There are no limitations to the number of members who may participate on the workgroup.

The workgroup's membership will be composed of, but is not limited to, representatives of industry and business, academia, agribusiness, regulatory organizations, environmental organizations, health disciplines, transportation planning organizations, county and municipal government agencies, and the general public.

Workgroup members will be expected to represent their organization's interests and concerns. Designated alternate workgroup members should have the same level of knowledge and expertise as the primary workgroup member and also be able to represent their organization's interests and concerns.

All workgroup meetings and subcommittee meetings will be open to the public. Interested persons may attend meetings, appear before the workgroup or subcommittees, or file comments with the Department.

8. Duration and Termination:

This charter will be in effect until December 1, 2010, at which time it is anticipated that the workgroup will be disbanded. On and after this date, the Department may consult as needed on a case-by-case basis with workgroup members to facilitate preparation of reports, rulemakings, and legislative proposals.

9. Subcommittees:

Given the complexity of the topic it is anticipated that there will be a need to break into subcommittees as approved by Department for any purpose consistent with this charter. Subcommittee meetings will occur outside of the workgroup meetings and will be scheduled as needed by the subcommittee members. Such subcommittees may not work independently of the chartered workgroup and must report their recommendations and advice to the workgroup for full deliberation and discussion. Subcommittees have no authority to make decisions on behalf of the chartered workgroup, nor can they report directly to the Department.

10. Recordkeeping:

The Department must maintain records of the workgroup, which will include agendas, presentations, technical information posted on the Department's Website, documents and reports with recommended actions, and other materials generated by the workgroup, subcommittees, or individual members. Chairs for established subcommittees will be responsible for maintaining records of their respective subcommittee meetings, or appointing another member of the subcommittee to do so, and shall provide all records to Department at anytime upon request of Department, and at the conclusion of the subcommittee's activities. Workgroup and subcommittee records will constitute public records available for public inspection.

Appendix II: PM2.5 Workgroup Membership and Participating DNR Staff

Kate Allen
Iowa Health Systems

Jeremy Becker
Polk County Public Works - Air Quality Division
Alternate: Jim Voigt, Jeff Gabby

Benjamin Behrendt
University of Iowa

Tyler Bettin
Iowa Pork Producers Association
Alternate: Jeff Schnell

Kevin Blanshan
INRCOG
Alternate: Andrea White

Nathan Bonnett
Iowa State Association of Counties
Alternate: Linda Hinton

Rex Butler
Central Iowa Power Cooperative
Alternate: Sam Stineman, Gary Slaby

Doug Campbell
DNR - Air Quality Bureau
Alternate:

Ryan Carlson
Martin Marietta Materials, Inc.

Greg Carmichael
Center for Global & Regional Env. Research
Alternate: Charles Stanier

Tracey Casburn
Environmental Protection Agency Region 7

Amy Christensen
Iowa Utilities Board
Alternate: Jeff Kaman

Rafe Christopherson
POET
Alternate: Erin Heupel

Robert Colosimo
Artistic Waste Services
Alternate: Chris Reynolds

Chad Daniel
Stanley Consultants Inc

Anthony Daugherty
Linn County Public Health - Air Quality Division

Tim Dougherty
Iowa Environmental Health Association
Alternate: Carmily Stone

Gary Douglas
Douglas Environmental Consulting

Mick Durham
Grain Processing Corporation
Alternate: Darin Osland

Fred Earley
Vermeer Corporation
Alternate: Terry Butler

David Ferris
South Iowa Municipal Electric Cooperation Association
Alternate: Duane Armstead

Jeff Fiagle
DNR - P2 Services

Catharine Fitzsimmons
DNR - Air Quality Bureau

Sean Fitzsimmons
DNR - Air Quality Bureau

Steve Fugate
Iowa Renewable Energy Association

Duane Gangwish
Iowa Cattlemen's Association

Wayne Gieselman
DNR - Environmental Services

Chris Gruenhagen
Iowa Farm Bureau
Alternate: Rick Robinson

Lori Hanson
DNR - Air Quality Bureau

Jessica Harder
Iowa League of Cities
Alternate: Megan Osweiler

Jim Hodina
Linn County Public Health - Air Quality Division
Alternate: Shane Dodge

Steve Hoff
Iowa State University
Alternate: Jay Harmon

Brian Hutchins
DNR - Air Quality Bureau

Matthew Johnson
DNR - Air Quality Bureau

Jon Kallen
MidAmerican Energy Co.
Alternate: Josh Mohr

Chris Kjellmark
DNR - Air Quality Bureau

Mark Landa
Iowa's Electric Cooperatives

Lisa Larson
Larson Engineering PC

G. Scott Lesnet
HNI Corporation
Alternate: Lisa Loring

Michael Li
Alliant Energy
Alternate: Jim Klosterbuer

Laura Liegois
Iowa Society of Solid Waste Operations

Jan Loyson
Iowa Department of Economic Development

Pam Mackey-Taylor
Sierra Club
Alternate: Neila Seaman

Jason Marcel
DNR - Air Quality Bureau

John Maynes
Petroleum Marketers and Convenience Stores of Iowa
Alternate: Mona Bond

Gena McCullough
Bi-State Regional Commission
Alternate: Denise Bulat

Debra McDonald
Waste Management
Alternate: Luci Alteri, Paul Taylor

Jim McGraw
DNR - Air Quality Bureau

Joe McGuire
Oldcastle Materials Group
Alternate: Danielle Hargens

John Mitchell
Alcoa, Inc.

Nicole Molt
Iowa Association of Business & Industry

Cathy Nicholas
Iowa County Engineers Association
Alternate: Lynn Kloberdanz

Jim Nitzchke
Deere & Company
Alternate: Fred Van Schepen

Terry Noteboom
Pella Corporation
Alternate: Jim Nieboer

Shelby Olsen
Martin Marietta Materials, Inc.

Randy Olson
Iowa Biodiesel Board
Alternate: Gary Dickey

Lain Pacini
Stanley Consultants Inc
Alternate: Ryan Kluss

Nick Page
DNR - Air Quality Bureau

Don Pauken
Muscatine Power & Water
Alternate: Brandy Olson

Christine Paulson
DNR - Air Quality Bureau

Garrett Pedersen
Iowa Department of Transportation
Alternate: Stu Anderson

Chris Petersen
Iowa Farmers Union
Alternate: Bill Drury

Dave Phelps
DNR - Air Quality Bureau

Wendy Walker
DNR - Air Quality Bureau

Chandra Ravada
East Central Intergovernmental Association
Alternate: Jake Ironside

Steve Roe
Izzak Walton League - Iowa Division
Alternate: Mike Delaney, Mike Murphy

Chris Roling
DNR - Air Quality Bureau

Bill Rosener
Asphalt Paving Association of Iowa
Alternate: Larry Mattusch

Jeff Ross
Cambrex Charles City Inc
Alternate: Sarah Vance

Kristine Rossmiller
Drake University

Joe Sanfilippo
DNR - Field Services

Tom Sanicola
SSAB Iowa Inc
Alternate: Shannon Johnson

Heather Schebel
Schebel Environmental

Stuart Schmitz
Iowa Department of Public Health

Jeff Schnell
Iowa Pork Producers Association
Alternate: Tyler Bettin

Neila Seaman
Sierra Club

Nicole Shalla
Plains Justice
Alternate: Doug Wagner

Jack Skelley
Gerdau Ameristeel
Alternate: Jennifer Van Hall

Julie Smith
Iowa Association of Municipal Utilities

Rich Stephens
Archer Daniels Midland
Alternate: Sara Speser

Sharon Tathinen
DNR - Environmental Services

Wally Taylor
Sierra Club

David Thompson
Thompson Environmental
Alternate: Doug Judge

Brian Trower
City of Ames
Alternate: Tim McCollough

Fred Van Schepen
Deere & Company
Alternate: Shelley Hackett

Tara Wetzel
Mathy Construction Company

Bethany Wilcoxon
Des Moines Area Metropolitan Planning Organization
Alternate: Adam Noelting

Todd Scott
Iowa Limestone Producers Association
Alternate: Mona Bond

Leland Searles
Iowa Environmental Council
Alternate: Marian Gelb

Monte Shaw
Iowa Renewable Fuels Association
Alternate: Grant Menke

Gary Smith
DNR - Air Quality Bureau

Scott Smith
Iowa Society of Solid Waste Operations

Mark Stone
DNR - Air Quality Bureau
Alternate: Anthony Bigger

Gene Taylor
Trinity Consultants

Dennis Thielen
DNR - Air Quality Bureau

Sherry Timmins
Iowa Department of Economic Development

Mike Valde
University of Iowa
Alternate: Ferman Milster

Lindsey Wanderscheid
Iowa State University
Alternate: Sean Whalen

Tim Wickam
Iowa Department of Public Health
Alternate: Carmily Stone

Rich White
Iowa Limestone Producers Association

Appendix III: Results from the PM2.5 Brainstorming Session

The Department held a brainstorming session on June 23, 2010 in order to generate ideas on implementing the PM2.5 standard. Information on PM2.5, the Clean Air Act, and SIP requirements were reviewed on June 9 and the first half of the meeting on June 23. All participants were given adhesive pad to write ideas or questions on during the second portion of the meeting. Each person had up to 3 opportunities to state their ideas aloud. Some ideas were discussed briefly in order to clarify the intent. All ideas were collected and posted on the walls. Non-Department participants were given 10 votes each. The ideas, almost 150 in total, were then grouped into categories which became the subcommittees. Some ideas were moved to other committees during the workgroup process and may have been counted twice in the subcommittee section.

Issues From the brainstorming session	Points	Committee
Modeling trigger? Includes "Should we/could we be modeling all sources throughout the state (including small sources)" and "How much benefit would result by requiring minimum % GEP stack height for SO2 and NOx emission sources in eastern Iowa unless MSL is met?"	32	Permitting
What are the parameters (limits) for insignificant and/or exempt sources for permitting?	31	Permitting
How will off road mobile equipment and diesel engines/generators (in aggregate mining sector) be regulated?	19	Permitting
How should permitting and modeling of PM2.5 fugitives be treated?	12	Permitting
What will be the permitted allowable concentration for PM2.5?	7	Permitting
Landfill emissions reports/permits: How does PM2.5 impact facility operations (heavy equipment, ICE's) and how will existing and upcoming air permits be affected?	7	Permitting
What is the major source PTE and significant increase PTE for PM2.5?	4	Permitting
Should DNR be setting PM2.5 emission limits now for certain types of projects (i.e. PSD avoidance, trouble spots, etc.)?	3	Permitting
What is RACT and BACT for PM2.5?	3	Permitting
Will updates to the default control efficiency document be needed?	2	Permitting
Should we add a PM2.5 maximum to the small unit exemption like we have for the other criteria pollutants?	2	Permitting
How will permitting of processing plants (asphalt, ready mix, rock crushing) be affected by these rules?	2	Permitting
How will BACT be impacted with pollutant trade-offs? Also, NH3 injection to reduce NOx?	2	Permitting
Will periodic monitoring guidance document for Title V need to be updated?	1	Permitting
Recordkeeping?	1	Permitting
RACT, BACT, MACT in nonattainment areas before SIP is approved?	1	Permitting

Will current air permits require modification to include PM2.5 controls?	1	Permitting
Do you expect to control stationary engines, such as generators, and off-road engines, such as mobile construction equipment, with the retrofitting of these engines via emission control systems, such as particulate filters (please consider NSPS subpart ZZZZ)?	1	Permitting
What PM2.5 emissions standards might be developed? Grain loading? Fuel standard? If emissions are unknown, how is construction permitting handled?	1	Permitting
How will regulation be handled at existing stationary sources?	0	Permitting
Will more time be needed to compare PM2.5 emissions with emission limits? What will the turnaround time be on projects?	0	Permitting
Would DNR look to impose monthly emission limits into permits to account for seasonality of PM2.5 and secondary pollutant impacts? Similar methods are in place for wastewater discharge permits.	0	Permitting
Does the opacity standard need to be changed?	0	Permitting
How would DNR rules affect hospital facilities such as medical incinerators?	0	Permitting
How do we ensure the current construction permit exemptions protect the PM2.5 NAAQS?	0	Permitting
Does the DNR need to re-evaluate permit-by-rules and permit templates to assure that they are protective of the NAAQS?	0	Permitting
What new PM2.5 RACT like rules (emission limits) will be needed for various source categories?	0	Permitting
Need to investigate modeling off-ramps, RACT-BACT-LAER specific suite of controls.	0	Permitting
How will BACT applicability be affected by adding PM2.5 as a pollutant? Specific monitoring for PM2.5?	0	Permitting
How will compliance be met when the background is above the maximum PM2.5 NAAQS?	12	Modeling/ Ambient Monitoring
Should PM2.5 be modeled at all at this time? Should it be limited to major sources?	10	Modeling/ Ambient Monitoring
Does the DNR need to follow EPA guidance or can we develop our own modeling guidance/methods for our non-PSD modeling?	8	Modeling/ Ambient Monitoring
Will direct PM2.5 be modeled only since secondary PM2.5 is regional and is included in background?	8	Modeling/ Ambient Monitoring
What would the state models look like if we assumed a 10-25% emissions reduction from all of the source categories that contribute more than 10% of the total PM2.5 emissions?	4	Modeling/ Ambient Monitoring
How will DNR deal with PM2.5 modeling if a facility exceeds the NAAQS due to background concentrations for minor source permits?	3	Modeling/ Ambient Monitoring

Will the implementation team investigate modeling off-ramps for non-PSD modeling (installation of BACT, RACT, new state standards?	3	Modeling/ Ambient Monitoring
How will modeling play in the PM2.5 implementation (if, who, what, when)?	3	Modeling/ Ambient Monitoring
Have we firmly established background levels for state, region, counties?	2	Modeling/ Ambient Monitoring
Are there sufficient monitors throughout the state to have the information (data) needed?	2	Modeling/ Ambient Monitoring
If the monitors report back high levels, is the plan to encompass a facility with monitors?	2	Modeling/ Ambient Monitoring
Will only direct PM2.5 emissions be modeled or if secondary formation will be considered will the department thresholds be established and how would secondary formation be modeled?	0	Modeling/ Ambient Monitoring
Should enclosure credit be allowed for PM2.5 for estimating emissions and for modeling?	0	Modeling/ Ambient Monitoring
How effective is increasing stack height and does it improve all parameters?	0	Modeling/ Ambient Monitoring
How much more clean can we get the air before we reach background levels?	0	Modeling/ Ambient Monitoring
Any additional modeling tools other than AERMOD being considered as it does not account for atmospheric chemistry processes that form most of the PM2.5 in ambient air?	0	Modeling/ Ambient Monitoring
What modifications are needed to the DNR modeling guidelines and forms?		Modeling/ Ambient Monitoring
Does DNR have a blueprint to improve PM2.5 monitoring (new sites, greater frequency, etc.)?	0	Modeling/ Ambient Monitoring
Can I have a monitor for my house?	0	Modeling/ Ambient Monitoring
How can a monitor that is adversely affected by a single source of pollution be considered a representative sample location?	0	Modeling/ Ambient Monitoring
How can DNR improve consistency of monitoring (placement of monitors in relation to specific sites, sampling frequency)?	0	Modeling/ Ambient Monitoring
How do we balance local community goals of protecting public health & providing for economic development? What role do local government officials have in this?	12	Policy/Govt Relations

Will economic impact on industries and local communities (which could be significant) be considered during the PM2.5 implementation process? How will increased costs be covered?	11	Policy/Govt Relations
Will IDNR consider a strategy of regulating only fuel combustion sources? In regional areas?	10	Policy/Govt Relations
Will cost impacts be taken into account when discussing potential reductions? Cost benefit analysis when determining compliance?	10	Policy/Govt Relations
How will PM2.5 precursors be considered in our point source strategy (permitting, monitoring, interpollutant trading)?	7	Policy/Govt Relations
What will the Department do in terms of providing educational materials or accurate information to the general public, elected officials and others who are involved in the rulemaking process?	7	Policy/Govt Relations
Avoid redundant regulations on point sources. Consider current regulations by the EPA (et al) in the creation of the PM2.5 rules (i.e. CAIR and the replacement for CAIR past 2010).	5	Policy/Govt Relations
Outreach in non-attainment "borderline" areas: work with regional planning agencies more closely when targeting discussions/solutions; RPAs can help with land use outreach	5	Policy/Govt Relations
How will resources be allocated? Low hanging fruit? By sector impact? IDNR authority? Should resources be focused on agricultural and mobile sources?	5	Policy/Govt Relations
Will there be new requirements for attainment areas? How to determine the cause/contribution to non-attainment areas?	4	Policy/Govt Relations
What will coal fired electric generating facilities have to do to comply? In attainment areas? In non-attainment areas?	4	Policy/Govt Relations
What sectors will be targeted for reduction efforts? Will efforts focus on high emitting groups or more across the board reductions? Will economic benefit be considered?	4	Policy/Govt Relations
Coordination with other States/	3	Policy/Govt Relations
Need to regulate precursors- things that can be measured - too much atmospheric chemistry to directly regulate PM2.5. Many precursors being reduced in pending federal changes.	3	Policy/Govt Relations
Peer reviewed health effects research on PM2.5	2	Policy/Govt Relations
Can implementation of PM2.5 requirements be staggered by source sector?	2	Policy/Govt Relations
Will the IA Dept. of Public Health be more visibly involved in helping lead our State into regulating PM2.5?	1	Policy/Govt Relations
What is an appropriate allocation of resources (DNR) to resolve PM2.5 issues in Iowa?	1	Policy/Govt Relations
What happens if we do nothing (no IDNR action)?	1	Policy/Govt Relations
Can we establish specific compliance dates through DNR rules?	1	Policy/Govt Relations

How should conflicting outcome be reconciled between the Clean Water Act and the Clean Air Act regulations?	1	Policy/Govt Relations
What move/recommendation can the DNR make to move from fossil fuel energy creation since it is a primary source of SO2 and NOx to "clean" energy creation? How appropriate is that for this agency?	1	Policy/Govt Relations
Can applicable state-owned facilities be utilized for modeling and compliance experimentation?	0	Policy/Govt Relations
What happens if an area listed as non-attainment has a major contributor go under or make drastic reductions? Can that be used to leverage the designation?	0	Policy/Govt Relations
How to maintain increasing productivity while lowering PM2.5 and/or precursors?	0	Policy/Govt Relations
If the workgroup determines that there isn't enough data to proceed, what are the consequences of doing nothing?	0	Policy/Govt Relations
Does DNR have a budget to improve AP-42 emission factors related to PM2.5 specified for most sources in Iowa?	0	Policy/Govt Relations
Economic impacts of implementing the standard will be considered. How will health impacts and their indirect cost be factored into development of implementation?	0	Policy/Govt Relations
Beyond modeling are there other methods to demonstrate attainment?	0	Policy/Govt Relations
How should the ideas be implemented? Should they be a regional approach?	0	Policy/Govt Relations
How can regulatory certainty be increased as part of the PM2.5 implementation? Off ramps? State standards (perf)?	0	Policy/Govt Relations
Source sector, PM2.5 vs. pending climate change, short lived focus	0	Policy/Govt Relations
Should this workgroup consider more aggressive PM2.5 & precursor emission reduction strategies now if EPA's pending PM2.5 NAAQS revision to something lower than 35?	0	Policy/Govt Relations
Rural sources of PM2.5 include many sector sources. Will speciation be used to target regulatory compliance?	0	Policy/Govt Relations
How do we maintain the focus on the fact that these standards are based on science that relate to damages to human health?	0	Policy/Govt Relations
Educating the public	0	Policy/Govt Relations
Focus on solutions that are attainable from a policy perspective. In Iowa, do we have the resolve to address sources such as feed lots, confinement facility, industry?	0	Policy/Govt Relations
What is the current status of the Iowa SIP? Where/how specifically does this workgroup impact or influence the SIP?	0	Policy/Govt Relations
Does the Title V fee need to be restructured?	0	Policy/Govt Relations

How does the DNR pay to implement PM2.5? Is a separate fee program needed?	0	Policy/Govt Relations
Is it possible to limit fuel use on a statewide level to that of low sulfur (diesel) for stationary and mobile sources?? Or perhaps stationary (point) sources in regional areas?	0	Policy/Govt Relations
Given the health implications of PM2.5, will local health departments bear any of the regulatory burden?	0	Policy/Govt Relations
What efforts are local communities doing to lower PM2.5 levels? Responsibilities fall on other industries? What allowances are made for background? Can it be lowered?	0	Policy/Govt Relations
How will the PM2.5 rules impact Iowa utilities and their customers?	0	Policy/Govt Relations
How do we get more funding for monitors so we can have better data?	0	Policy/Govt Relations
Have sufficient studies been done in Iowa to determine that health impacts of point sources and non-point sources of PM2.5?		Policy/Govt Relations
Could the installation of LAER (lowest achievable emission rate) be considered enough?	0	Policy/Govt Relations
What impact will PM2.5 have on regional planning agencies? New regulations? Requirements?	0	Policy/Govt Relations
Adequate funding for DNR-ESD Field Offices so they can adequately enforce DNR air quality regulations at non-Title V facilities?	0	Policy/Govt Relations
What is planned for education and outreach to communities?	0	Policy/Govt Relations
Coordinate this effort with the Iowa DOT/DNR Climate Control/Greenhouse gas reduction efforts particularly from a transportation perspective.	0	Policy/Govt Relations
Are EPA emission factors and inventories accurate and are they scientifically defensible?	10	Emission Inventory/Stack Testing
What are the alternatives to stack testing for PM2.5?	8	Emission Inventory/Stack Testing
Is there an acceptable reference method for PM2.5?	7	Emission Inventory/Stack Testing
Should filterable & condensable PM2.5 be reported separately in emission inventories?	6	Emission Inventory/Stack Testing
Pertaining to off-road mobile equipment and diesel engines/generators (in the aggregate mining sector), what information would be needed to calculate PM2.5?	5	Emission Inventory/Stack Testing

Testing requirements for PM2.5? Methods and timelines.	4	Emission Inventory/Stack Testing
There are limited to no emission factor data for many operations, especially non-combustion operations. With some of these operations, it can be very difficult to quantify the PM subset group 2.5. How will these issues be addressed?	3	Emission Inventory/Stack Testing
Will biogenic emissions from point sources be included? Biogas offsetting natural gas?	2	Emission Inventory/Stack Testing
What are the best PM2.5 emission factors to use? EPA, AP-42, PM calculator, stack test results, CEMS, ration of PM2.5/PM10?	1	Emission Inventory/Stack Testing
How do we classify an activity like a landfill? As a point source or non-point source?	1	Emission Inventory/Stack Testing
How do we ensure that accurate PM2.5 emission factors are being used for permitting, modeling, and emission inventory purposes?	1	Emission Inventory/Stack Testing
How are we going to collect PM2.5 emission data and develop better quality emission factors and emission inventories?	0	Emission Inventory/Stack Testing
What is the SO2 concerns from landfills or solid waste facilities?	0	Emission Inventory/Stack Testing
EPA has included "crustal material" in the definition of PM2.5. How much influence does crustal material have on the total mass of PM2.5?	0	Emission Inventory/Stack Testing
Do we need to update the sampling manual to address provisions not covered in the PM2.5 methods?	0	Emission Inventory/Stack Testing
Should all new sources be required to stack test for PM2.5?	0	Emission Inventory/Stack Testing
Issues with stack testing: varying flow, high temperature stacks, wet exhaust problems, final EPA rule	0	Emission Inventory/Stack Testing
Are there CEMs for PM2.5?	0	Emission Inventory/Stack Testing
Do we need a protocol for a minimum catch?	0	Emission Inventory/Stack Testing

How to define the relationship between emission standards, the reporting & test methods. Are the precursors like ammonia going to be tested & limited? How many for a typical industry? Make sure the test methods and typical testing requirements are defined in the rules.	0	Emission Inventory/Stack Testing
Development of strategies to reduce NOx, SO2, ammonia, etc	9	On-the-books/ Precursors
How will the Boiler MACT effect PM2.5 implementation	6	On-the-books/ Precursors
With the RICE rules be put into place, should this help to reduce the NOx and SO2	5	On-the-books/ Precursors
Will the current engine standards that are phasing in (i.e. Tiered engine requirements for manufacturers, NSPS subpart IIII and JJJJ, and NESHAP ZZZZ) be considered as reduction for PM2.5 in years to come	5	On-the-books/ Precursors
How should we address interstate transport into and out of the state?	4	On-the-books/ Precursors
How will secondary PM2.5 be treated Scaled? 1 ton NOx = 1 ton PM2.5	3	On-the-books/ Precursors
Precursors look to be 60-75% of the ambient concentration. What PM2.5 precursor pollutants are the most important? How do we control the precursors?	3	On-the-books/ Precursors
Do we expect to reduce NOx or SO2 allowable emissions to reduce PM2.5 formation?	1	On-the-books/ Precursors
How effective will further local NOx emission reductions be in lowering regional background PM2.5 levels?	0	On-the-books/ Precursors
Secondary pollutants (NH3, SO2, NOx). How to decide the source, and instate or out of state?	0	On-the-books/ Precursors
How are contributions from beyond the state boundary going to be addressed?	0	On-the-books/ Precursors
How will the NAAQS for NOx and SOx contribute to the reduction of PM2.5?	0	On-the-books/ Precursors
New emissions standard implemented by EPA on farm machinery-projected effect, change?	21	Area Sources
How can we reduce the 80% contribution of direct PM2.5 from area sources?	16	Area Sources
How will agriculture industry solutions & emissions reductions be addressed? Best practices from tillage or equipment emission solutions, animal husbandry practices, create incentives to change NH3 practices?	13	Area Sources
Set an enforceable standard for emissions from agriculture facilities (confinements, dairies, etc.)	9	Area Sources
Will IDNR work to restrict open burning on a statewide basis? PM2.5 and ozone benefits.	8	Area Sources

How are we going to address uncontrolled sources of PM2.5 including open burning, agriculture, wood stoves, outdoor wood boilers, 2-cycle engines, idling trucks, old diesel engines)	7	Area Sources
Deal with field preparation dust & dust from harvesting. In cannot be eliminated.	5	Area Sources
The data & Dr. Stanier's presentation shows that 98% of the occurrences happen during cold weather/winter months. This is typically when there is little to no agricultural & construction activities which involves heavy duty diesel off road equipment…off road focus on this group?	5	Area Sources
Swine, animal feeding monitoring - has data been compiled in regard to concentrated areas to monitor ammonia?	2	Area Sources
What data can be used to discourage back yard burning of trash and leaves to residents, local or state ordinance?	2	Area Sources
What level of benefit will be achieved by banning trash and leaf burning?	1	Area Sources
Are there additional sources of PM2.5 that should be quantified or inventoried?	1	Area Sources
Agricultural sources appear to contribute significantly to Pm2.5 and precursors. Does this need to be included in the Master Matrix to control both fertilizer application and land application of manure?	0	Area Sources
What are the effects of moving to no till farming? On farmers? On production?	0	Area Sources
How much do gravel roads contribute to PM2.5 pollution? Explain the pollution process. Do engineers need to find ways to reduce gravel road dust?	13	Transportation
How would truck fleets be impacted? What permitting, reporting, or testing would be required for hauling or transportation, if any?	13	Transportation
Better identify or quantify the impact of mobile sources, i.e. vehicle emissions, that represent a fair representation of the overall problem. In some areas reducing vehicle emissions may not be the solution to the bigger issue.	6	Transportation
Ensure that any transportation related corrective measures accurately reflect transportation's contribution to the problem.	5	Transportation
How much does sanding & salting the roads in winter contribute to the PM2.5 pollution problem? Do road engineers need to be looking at ways to reduce the usage of sand & salt on roadways in the winter time?	3	Transportation
How do we reduce NOx and VOC emissions from on-road sources? What reactions involve NOx and VOC, and are these limited?	3	Transportation
Who would be responsible for the emission modeling with MOVES in a non-attainment situation? What agency?	3	Transportation
What authority does DNR have to regulate mobile sources & will there be an impact on fleet owners?	2	Transportation

Will an increase in the use of bio-fuels result in higher NOx, SO2, and thereby increasing the PM2.5 levels? Use of 100% biodiesel reduces diesel particulate matter which is a federal standard in our industry.	1	Transportation
Should the State consider anti-idling legislation?	1	Transportation
Ethanol - what impact would mandating more or less ethanol in gasoline have on compliance?	1	Transportation
Set an enforceable standard for the control of fugitive dust from unpaved public roads.	0	Transportation
Clarify issues related to the differences/causes behind the rural and urban levels attributed to on-road mobile sources.	0	Transportation
How can PM2.5 modeling be integrated with travel demand modeling?	0	Transportation

Appendix IV: Subcommittee Instructions and Expectations

IOWA DEPARTMENT OF NATURAL RESOURCES
PM2.5 NAAQS IMPLEMENTATION WORKGROUP

Subcommittee Instructions and Expectations

Formation and Organization:

- Subcommittees will be established by the workgroup. Each subcommittee will have a chair or co-chairs.
- Workgroup members are encouraged to join one or more subcommittees by adding their name to the sign up list for the applicable subcommittee. Members may indicate that they would like to chair or co-chair a subcommittee when they add their name to the signup list.
- An election will be conducted by the subcommittee members of any subcommittee with more than two members who want to chair or co-chair the subcommittee.

Meeting Logistics:

- Subcommittee meetings will occur outside of the workgroup meetings and will be scheduled as needed by the subcommittee chair(s).
- Subcommittee meetings may be conducted at any location agreed upon by subcommittee members or may be conducted through electronic means.
- Subcommittee meetings are public meetings and public access must be provided to meeting sites. The Department must be notified of the meeting at least 3 business days in advance in order to provide the information on the Internet.
- The Department will facilitate meeting room scheduling for subcommittee meetings that may be held at the Air Quality Bureau.

Subcommittee Process

- Topics and order of discussion for each subcommittee will be established by the workgroup, but should include the highest priority elements identified during the workgroup brainstorming activity.

- Subcommittees are encouraged to develop recommendations and to present those recommendations to the entire workgroup as soon as practical. The recommendations should include:
    - Statement of the issue addressed,
    - Recommendations for addressing the issue, including an outline of the benefits and dis-benefits of the recommendations and significant alternatives,
    - Strategies for adopting the recommendations and,
    - Technical justifications.
- Subcommittees may not reach consensus recommendations on some issues and are encouraged to provide opportunities for all viewpoints to be discussed and developed for presentation to the workgroup.
- Recommendations and alternative positions must be reported to the workgroup for full deliberation and discussion.
- It is anticipated that each subcommittee will have met once prior to the July 8, 2010 workgroup meeting.

Full Workgroup Updates:

- The chair or co-chairs will provide updates on the subcommittee's progress to the main workgroup at each regularly scheduled workgroup meeting.
- A timeline to review the topics and provide recommendations on the topics assigned to each subcommittee is encouraged to be presented at the July 8, 2010 meeting. The intent is to ensure that all topics will be reviewed prior to the conclusion of the workgroup.
- Subcommittee chairs or co-chairs will be asked to provide agenda items (recommendations) for discussion prior to each workgroup meeting.

Recordkeeping:

- Subcommittee chairs or co-chairs are responsible for maintaining records of their respective subcommittee meetings, or appointing another member of the subcommittee to do so.
- Subcommittee records will constitute public records available for public inspection. These records will be provided to the Department at anytime upon request. All records will be submitted to the Department at the conclusion of the subcommittee meetings.

Appendix V: PM2.5 Modeling Survey Summary

Questions developed and results compiled by members of the Modeling/Ambient Air Monitoring Subcommittee. Survey distributed by NACAA to state and local air directors at request of the Department.

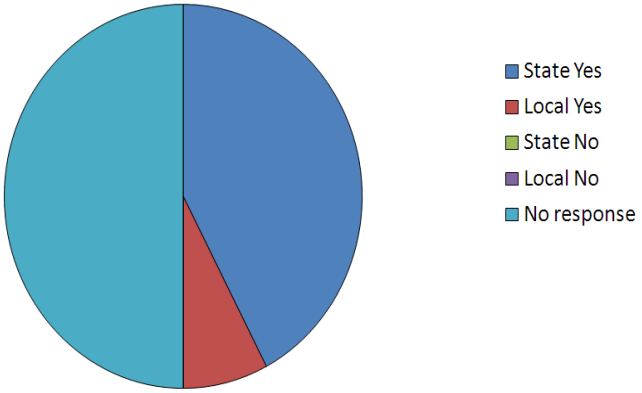
Response Summary

- 26 replies (20 states, 6 locals)
- Midwest- IL, MN, MO, MO/STL, WI

Response Summary by Question

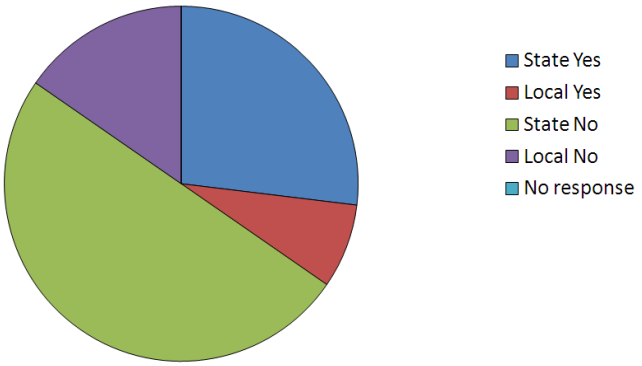
1) *Currently Modeling PM2.5 for Major Source Permitting?*

All replied yes or did not answer question.



2) *Currently Modeling PM2.5 for Minor Source Permitting?*

15-No;
2-No, buts (if there are special circumstances and for increment (when set) if PM2.5 minor source baseline date has been triggered.
9-Yes



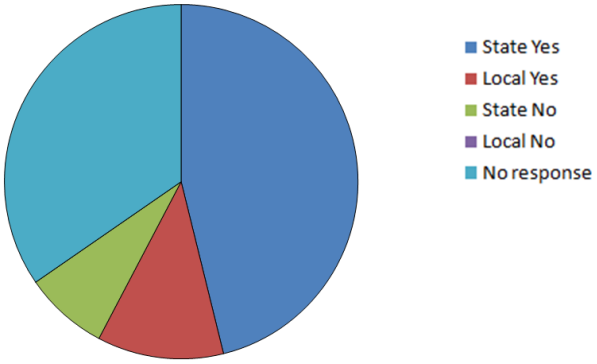
3) *Number of Permits Issued utilizing PM2.5 Modeling?*

NM- 75-100,
CT- 25,
MI-12,
MN-<10,
SC- 3;
IL, MO, WI- 1 ea.

4) *Planning on Modeling PM2.5 for Minor Source Permitting?*

17- Yes or Currently doing or Maybes;
2-No; 7-No response

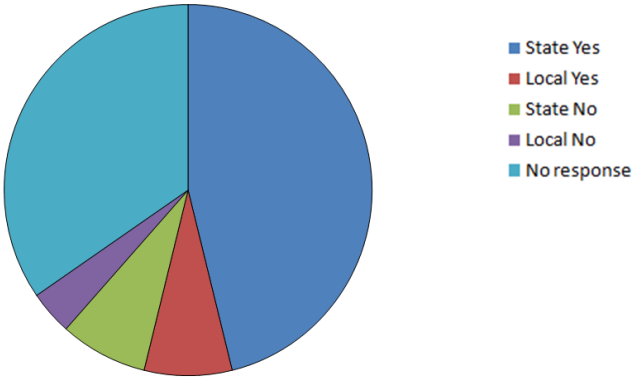
- IL- No, but If project has strong public concern or which has potential human health/quality-of-life impacts (e.g. environmental justice, odors, elevated HAP exposure risk, etc.), may be required to perform PM2.5 modeling.
- MN-Maybe- exploring policy options.
- WI- Yes- Beginning Fall 2010.
- MO/STL- No response



5) *Planning on Modeling PM2.5 for Minor Source projects at Major Sources?*

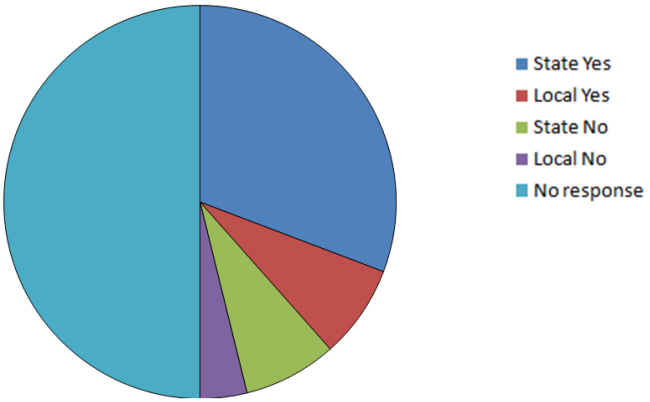
17- Yes or Currently doing or Maybes;
3-No, 6- No response or unknown.

- IL- No
- MN, MO, WI- Yes
- MO/STL- No response

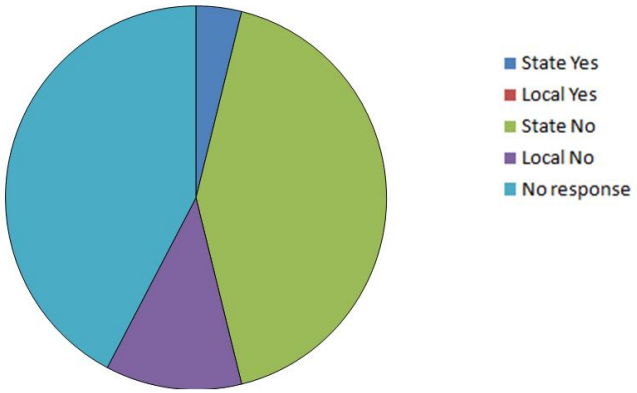


6) *PM2.5 Modeling Trigger Threshold?*

4- >10 tpy increase,
3- any increase,
1->0.5 tpy increase,
1- >10% of PSD threshold,
1- 1 lb/hr from point, 0.1 lb/hr from fugitives,
1- failed screening modeling.
Rest- under development or no response.

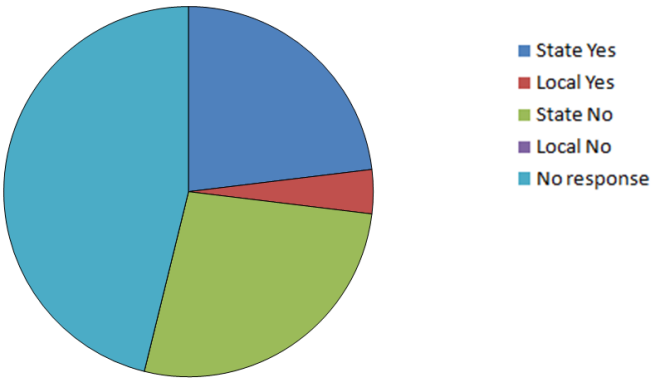


7) *Modeling Off Ramps?*
1- (SC)- developing exemptions. Rest- No.

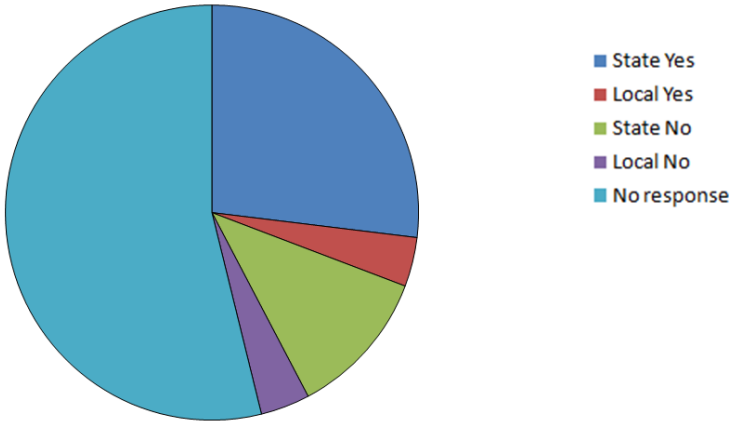


8) *Models Used?*
Majority using/planning to use AERMOD.
SCREEN3 or AERSCREEN allowed in some instances.
Two states included regional models in list.

9) *Currently using PM10 as a surrogate for PM2.5 impacts?*
9- Yes; 7-No; Rest no response.
IL, MO, WI- No
MN- Yes, if PM2.5 emissions not available.



10) *Do you feel that your current procedure for modeling PM2.5 produces inordinately high PM2.5 impacts that would not match monitored values?*
9-Yes; 4- No; 4- Not enough info; Rest- no response.
Concerns:
-Pairing of the maximum modeled concentrations with the background design value concentrations
-Use of PM10 emissions when PM2.5 data is lacking
-Double counting of facilities' contribution to background concentrations
-Models tend to over-predict impacts from many fugitive sources.



11) Is State Generated PM2.5 Modeling Guidance Available?
5-Yes (included IL)

12) How are you addressing the lack of emissions data for PM 2.5 sources in your modeling?
If no PM2.5 emissions data or emission factors, use PM10 emissions.

13) How do you calculate PM2.5 background values?
Use design value from representative monitor.
MN- exploring paired sums approach.

Appendix VI: Modeling Test Cases for PM10 as a Surrogate fo PM2.5

In order to expedite an evaluation of PM10 as a surrogate for PM2.5, the Department conducted a modeling review using recent PM10 modeling analyses conducted for the purpose of construction permitting as the basis for the modeling review. The recent PM10 modeling analyses had been conducted either by the applicant or by the Department according to the Department modeling guidelines for PM10 and using the most recent version of the AERMOD dispersion model. The review was limited to the 24-hour averaging period of PM10 and PM2.5.

An attempt was made to evaluate a variety of facility types and sizes. The Department evaluated a project to add a paint booth at a fairly small farm equipment manufacturer that emits 1.4 tons of PM10 per year (Facility A), a relatively small trailer manufacturing facility with all non-combustion sources that emits 1.1 tons per year of PM10 (Facility B), a relatively small municipal facility with all combustion emission sources that emits 0.2 tons per year of PM10 (Facility C), and a small project of 5.2 tons per year at a larger millwork facility that that has both combustion and non-combustion sources and emits 50.1 tons per year (Facility D).

For consistency, the Department revised the previous PM10 analyses to evaluate the highest, sixth-high predicted 24-hour concentrations and all emission points that vent inside the buildings were removed from the analyses. Previous Department practice has been to allow a building enclosure credit to be applied to PM10 emissions released inside a primarily enclosed structure. Since this practice will not apply to PM2.5 emissions, any emissions that vent inside an enclosed structure in the original PM10 modeling analyses were removed from the revised modeling analyses. The current state-wide default background value of 45 ug/m^3 was added to the revised modeled PM10 impacts.

Although the EPA PM2.5 modeling guidance indicates that the highest modeled 24-hour PM2.5 impacts should be added to the 98th percentile background concentration, the Department modeling analyses were conducted by adding the much less conservative average of the highest, eighth-highest modeled concentrations from each of the five year meteorological data set to the 98th percentile background concentration. The modeled PM2.5 emission rates were estimated by assuming that for combustion sources the PM2.5 emission rates are equivalent to PM10 emission rates. For non-combustion sources, the PM2.5 emission rate was assumed to be 23% of the PM10 emission rates. The 23% is based on a ratio of the PM2.5 and PM10 NAAQS. State-wide default background values for PM2.5 have not been determined at this time. The current PM2.5 24-hour design concentrations in Iowa for the period 2007–2009 range between a low concentration of 21 ug/m^3 to a high concentration of 38 ug/m^3. Since no state-wide background values have been determined for PM2.5, the lowest PM2.5 24-hour design value concentration of 21 ug/m^3 was added to the modeled PM2.5 impacts.

Facility A This farm machinery manufacturer has submitted a permit application to add a new paint booth. The application for the paint booth indicates that the paint booth will have a vertical unobstructed stack; it will emit PM10 at a rate of 0.82 lb/hr, and it will be located more than 100 feet from the facility's property boundary. Evaluating the paint booth project against the modeling determination flow chart indicates that no PM10 modeling will be required for this project. Using the assumption that the PM2.5 emission rate for a non-combustion source is 23% of the PM10 emission rate, the calculated PM2.5 emission rate for this non-combustion source is 0.19 lb/hr. At the calculated PM2.5 emission rate of 0.19 lb/hr from a vertical unobstructed stack located more than 100 feet from the property boundary, the proposed modeling determination flow chart (with PM2.5 thresholds) indicates that the paint booth project would still not require any modeling analysis to receive a construction permit. For this facility, it

can be assumed that evaluating PM10 as a surrogate for PM2.5 emissions would be protective of the PM2.5 standards.

Facility B This trailer manufacturing facility has four paint booths that all have a restriction to operate between the hours of 6:00 AM to midnight. In the first scenario, this facility has requested to remove the operating hour restrictions on all of their paint booths. Although there will be no increase to the hourly emission rate of 0.28 lb/hr per paint booth, the paint booths will now be operating 24 hours per day. Removing the operating restriction on the paint booths will result in a 1.2 ton per year increase in PM10 emissions. According to our modeling determination flow chart, this project triggers a modeling review because the paint booth stacks are located only 23 feet from the facility's property boundary. Removal of the operating restriction affects all four of the facility's paint booths, so a facility-wide modeling analysis is conducted. Results from the facility-wide PM10 modeling indicate that the predicted PM10 concentrations (including the background concentration) are well below the PM10 NAAQS. Please see Table 1 for the modeling results for Facility B.

Since all of the paint booths are non-combustion sources, the PM2.5 emission rates for the paint booths were calculated as 23% of their PM10 emission rates. This reduced the 0.28 lb/hr emission rate from each paint booth down to 0.06 lb/hr of PM2.5. Again, this project triggers a modeling review because the paint booth stacks are located only 23 feet from the facility's property boundary. Results from the facility-wide PM2.5 modeling analysis indicate that the predicted PM2.5 concentrations (including the background concentration) are below the PM2.5 NAAQS. In this case using PM10 as a surrogate for PM2.5 is protective of the PM2.5 standard. It is important to note that the predicted concentrations are below the NAAQS when the lowest possible PM2.5 design value of 21 ug/m^3 was used as the background concentration. Using monitored design concentrations typical of most of eastern Iowa for a background value would result in predicted concentrations that are greater than the PM2.5 NAAQS for this project.

In the second scenario the facility has requested to add a fifth paint booth. Although the PM10 emission rate for the new paint booth (0.55 lb/hr) is below the threshold listed in the modeling determination flow chart, it is also located less than 100 feet from the property boundary, and therefore the project requires a modeling review. Modeling of PM10 emissions from the new paint booth alone results in predicted impacts that are greater than the significant impact level for PM10. Because the modeled impacts from the paint booth alone are significant, a facility-wide PM10 analysis is conducted. Results from the facility-wide PM10 modeling including the new paint booth (with the background value) are below the PM10 NAAQS and the project is approved. See Table 1 for modeling results.

Although the PM2.5 emission rate for the new paint booth calculated as 23% of the PM10 emission rate (0.13 lb/hr) is below the PM2.5 threshold listed in the proposed modeling determination flow chart, it is still required to be modeled due to its proximity to the facility's property boundary. Modeling of PM2.5 emissions from the new paint booth alone results in predicted impacts that are greater than the significant impact level for PM2.5 and a facility-wide PM10 analysis is needed. Predicted results from the facility-wide PM2.5 modeling including the new paint booth (with the background value) are greater than the PM2.5 NAAQS. In this case using PM10 as a surrogate for PM2.5 would not be protective of the PM2.5 NAAQS as the current project is proposed, additional adjustments such as increasing the stack height or changing the location of the paint booth may be necessary to mitigate the predicted PM2.5 exceedances. Additional review of the modeled impacts indicated that over the 5 year dataset, there is at least one predicted exceedance on 3% of the days and predicted exceedances occur as far as 95 meters from the center of the facility.

Table 1. Modeling Results for Facility B (Trailer Manufacturing Facility)

Pollutant	Averaging Period	Predicted Concentration* (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
Scenario 1 - Project to Remove Operating Hour Restrictions on 4 Paint Booths					
PM10*	24-hour	48.1	45	93.1	150
PM2.5**	24-hour	8.9	21	29.9	35
Scenario 2 - Project to Add a New Paint Booth					
PM10*	24-hour	76.2	45	121.2	150
PM2.5**	24-hour	14.7	21	**35.7**	35

* The 24-hour PM10 concentrations are the highest-sixth-highest predicted value from all five years of meteorological data.
** The 24-hour PM2.5 concentrations are the highest-eighth-highest predicted value from all five years of meteorological data.

Facility C Facility C is a small municipal utility with two existing generators that has applied for a construction permit to add a third generator. The PM10 emission rate for the third generator is 3.58 lb/hr. At this emission rate, modeling of the new generator is required per the modeling determination flow chart. A modeling analysis of the proposed third generator by itself indicates that the generator has a significant impact and a facility-wide modeling analysis is required for the project. Facility-wide PM10 modeling of the utility results in predicted PM10 concentrations, including background, which are below the PM10 NAAQS and the project is approved. Please see Table 2 for the predicted modeling results from Facility C.

Since the three engines are combustion sources, the PM2.5 emission rates were set to equal the previously evaluated PM10 emission rates. At a PM2.5 emission rate of 3.58 lb/hr, a PM2.5 modeling analysis would be required per the proposed modeling determination flow chart. As with the PM10 analysis of the third generator by itself, the predicted PM2.5 concentrations result in impacts over the PM2.5 significant impact level and a facility-wide modeling analysis is required. Predicted concentrations from the facility-wide PM2.5 modeling with the third generator (including the background value) are greater than the PM2.5 NAAQS. For this project using PM10 as a surrogate for PM2.5 would not be protective of the PM2.5 NAAQS. Other changes to the stack configuration or the emission rate may be necessary to mitigate the predicted PM2.5 exceedances. Further analysis of the modeling results for the project as proposed indicate that over the five year meteorological dataset, there is at least one predicted exceedance on 46% of the days and predicted exceedances occur as far as 370 meters from the center of the facility.

Table 2. Worst Case Modeling Results for Facility C (Municipal Utility)

Pollutant	Averaging Period	Predicted Concentration* (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
PM10*	24-hour	86.1	45	131.1	150
PM2.5**	24-hour	69.1	21	**90.1**	35

* The 24-hour PM10 concentrations are the highest-sixth-highest predicted value from all five years of meteorological data.
** The 24-hour PM2.5 concentrations are the highest-eighth-highest predicted value from all five years of meteorological data.

Facility D This millwork facility has requested construction permits to replace a boiler. The PM10 emission rate for the new boiler is 1.2 lb/hr. Although this emission rate is below the PM10 threshold listed in the modeling determination flow chart, the proposed stack height is less than ten feet above some of the nearby building structures, so a modeling review is necessary. The PM10 predicted concentration from the boiler alone resulted in concentrations over the PM10 significant impact level and therefore a facility-wide PM10 modeling analysis was conducted. Facility-wide PM10 modeling of the millwork facility resulted in predicted PM10 concentrations (including background) that are below the PM10 NAAQS so the project is approved. Please see Table 3 for the predicted modeling results from Facility D.

For the PM2.5 analysis the boiler would still require a modeling analysis due to its proposed stack height relative to the nearby buildings. Because the new boiler is a combustion source its PM2.5 emission rate was determined to be equal to its PM10 emission rate (1.2 lb/hr). Modeled impacts from the boiler alone were predicted to be greater than the PM2.5 significant impact level so a facility-wide PM2.5 modeling analysis was conducted. The combustion sources at the facility were modeled with PM2.5 emission rates equal the PM10 emission rates and non-combustion sources were modeled with PM2.5 emission rates that are 23% of the PM10 emission rates. Predicted PM2.5 concentrations from the facility-wide modeling with the new boiler (including the background value) are greater than the PM2.5 NAAQS. For this project using PM10 as a surrogate for PM2.5 would not be protective of the PM2.5 NAAQS. Other changes to the stack configuration or the emission rate may be necessary to mitigate the predicted PM2.5 exceedances. Additional review of the modeled impacts indicated that over the 5 year dataset, there is at least one predicted exceedance on 31% of the days and predicted exceedances occur as far as 550 meters from the center of the facility.

Existing emission points at this facility include a combination of combustion and non-combustion sources. The combustion sources consist of four boilers, a generator, and two catalytic oxidizers. The 147 non-combustion sources consist of wood dust and treating, painting, drying, ovens, etc. Since this facility has both combustion and non-combustion sources, additional analyses were conducted to evaluate the relative impacts from the differing types of emission sources. The relative impacts from the combustion and non-combustion sources are also listed in Table 3. It is interesting to note that predicted PM2.5 impacts from the combustion sources alone nearly exceed the PM2.5 standard.

Table 3. Worst Case Modeling Results for Facility D (Millwork Facility)

Pollutant	Averaging Period	Predicted Concentration* (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
All Emission Points					
PM10*	24-hour	74.6	45	119.6	150
PM2.5**	24-hour	24.1	21	**45.1**	35
Combustion Emission Points Only					
PM10*	24-hour	17.8	45	62.8	150
PM2.5**	24-hour	13.9	21	34.9	35
Non-combustion Emission Points Only					
PM10*	24-hour	66.9	45	111.9	150

Pollutant	Averaging Period	Predicted Concentration* (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
PM2.5**	24-hour	10.8	21	31.8	35

* The 24-hour PM10 concentrations are the highest-sixth-highest predicted value from all five years of meteorological data.
** The 24-hour PM2.5 concentrations are the highest-eighth-highest predicted value from all five years of meteorological data.

Results summary Although the sample of facilities evaluated is small, it is representative of the typical type of projects received by the Department for modeling review. In some cases modeling PM10 as a surrogate for PM2.5 is protective of the PM2.5 standard. In other cases the evaluation indicates that modeling PM10 against the PM10 standards in not protective of the PM2.5 standard and that changes to the proposed stack configurations or emission rates may be necessary for a project to meet the PM2.5 standard.

The evaluation was conducted in a liberal manner in an effort to increase the odds that the PM2.5 modeling would meet the PM2.5 NAAQS by using the lowest possible 24-hour background value background, eliminating any internally venting sources from the analyses, by selecting previous PM10 modeling analyses with predicted impacts that were not close to the PM10 NAAQS, and by evaluating a form of the standard that is less conservative than EPA's current modeling guidance. Using background values more typical of eastern Iowa and including internally venting sources in the modeling analysis could result in even fewer cases where modeling PM10 as a surrogate for PM2.5 would be protective.

Using PM10 as a surrogate for modeling PM2.5 is especially problematic for combustion type sources. For combustion sources there is less controversy regarding PM2.5 emission rates and it is generally accepted that the PM2.5 emission rates are equivalent to the PM10 emission rates. Based on the above modeling evaluation, facilities with combustion type sources (Facilities C and D) have predicted concentrations that were above the PM2.5 NAAQS and changes to the stack configurations or the emission rates may be necessary to resolve the predicted PM2.5 exceedances.

There are numerous consequences for permitting projects that potentially exceed the PM2.5 standards. By permitting projects to go forward that may exceed the PM2.5 NAAQS the public could be exposed to pollutant concentrations that are known to have harmful effects, facilities may incur costs due to retro-fitting stack configurations or the need for additional control strategies as PM2.5 modeling is put in place in the future, projects that require PM2.5 modeling under the PSD program may have trouble due to smaller sources consuming all of the available PM2.5 increment, and the Department could end up permitting project that result in future monitored non-attainment, affecting the growth and economy of communities.

Appendix VII: Attendance

DNR

Meeting Attendance Record

DATE 6/9/2010

Please Print

Name	Affiliation	Mailing Address	City	State	Zip	Phone	Fax
DON PAULKEN	MPW	3205 CEDAR	MUSCATINE	IA	52761	563 262-3794	563 262-3315
Joe SANFILIPPO	IDNR	905 W MAIN	MANCHESTER	IA	52057	563-927-2640	
Tara Wetzel	Mathy Const	920 10th Ave N	Onalaska	WI	54650	608-779-6300	608-779-9192
Mark Landa	electric coops	6601 Westown	W. Des Moines	IA	50266		
SHELBY OLSEN	MARTIN MARIETTA	11252 Aurora Ave	Des Moines	IA	50322	210-319-2619	
Ryan Carlson	" "	"	"	"	"	515 689 9234	
Jeremy Baker	Polk Co	5885 NE 14th	Polk DM	IA	50313	515 286-2263	
JEFF ROSS	CAMBREX CHARLES CITY	1205 11th St	CHARLES CITY	IA	50616	641/257-1059	
P Prodely	DNR	—	—				
Joe McGuire	DMC Mining	2320 Zeller Drive	Le Grand	IA	50142	641-4792695 - (2003)	
Rade Christophersen	POET	4615 N Lewis Ave	Sioux Falls	SD	57104	605-865-2532	
Garrett Pedersen	DOT	800 Lincoln Way	Ames	IA	50010	515-239-1210	
Gene Taylor	Trinity Consultants	205 Washington Suite 200	Burlington	IA	52601	319/758-0758	
S. TIMMINS	DED						
Rich Stephens	ADM	1350 Waconia Ave SW	Cedar Rapids	IA	52404	319-398-0235	
Deb McDonald	WASTE MANAGEMENT	125 N MAIN	BLUE EARTH MN	MN	56013	507-526-2194	2195
Nicole Molta	ABI		DSM			235-0567	
Jim Nitzschke	John Deere	One John Deere Pl.	Moline	IL	61265	309-765-4576	

Please provide the information requested above. This will help ensure that we are able to provide you with any supplemental materials related to this meeting.

DNR

Meeting Attendance Record

DATE 6/9/10

Please Print

Name	Affiliation	Mailing Address	City	State	Zip	Phone	Fax
Tracey Casburn	EPA	901 N 5th St	KC	KS	66101	913-551-7066	
Dreanne Gangwish	ICA	~~1400~~ Po Box 1409	Ames	IA	50014	402-750-8150	
Tyler Bettin	IPPA	1636 NW 114th St	Clive	IA	50325	515-225-7675	515-225-0563
Sara Spieser	ADM	1935 E. Euclid	Des Moines	IA	50313	515-263-2109	
Gena McCullough	Bi-State R.C	PO BOX 3368	Rock Island	IL	61204-3368	309-793-6300	
Stu Schmitz	IDPH	Lucas Bld.				281-8707	281-4529
Tim Wickam	IDPH	Lucas Bld.				281-7462	281-4529
Chris Gruenhagen	Farm Bureau	5400 Univ	WDSM	IA	50266	2255528	
Michael Li	Alliant Energy		Cedar Rapids	IA		319-786-4653	
Shane Dodge	LCPH						
JIM HODSON							
Gary Doyle	D-E C	940 Springbrook	DeWitt	IA	52742	563-370-4853	
CATHY NICHOLAS	BLACKHAWK CO.					(319)833-3008	
Jon Kolla	MEC		Des Moines			515-281-2612	
[illegible]							
Heather Schebel	Schebel Env.	5060 Cherry Woods Dr	West Des Moines	IA	50265	515 710 1059	
Chandra Kavale	Dubuque MPO	~~[illegible]~~ 50 Courtney Park	Dubuque	IA	52002	563-556-4166	
Fred Farley	Vermeer	1210 Vermeer Rd	Pella	IA			

Please provide the information requested above. This will help ensure that we are able to provide you with any supplemental materials related to this meeting.

DNR

Meeting Attendance Record

DATE 6/9/2010

Please Print

Name	Affiliation	Mailing Address	City	State	Zip	Phone	Fax
Laura Liegois	~~[illegible]~~ ISOSCO	1000 S Holiser St.	Muscatine	IA	52761	563-263-9664	563-263-9665
David Ferris	IAMU	306 N Elm	Lenox	IA	50851	641-413-0020	—
Steve Hoff	ISU	212 Davidson	Ames	IA	50011	515-291-[illegible]26	
Scott Lesher	HNI Corp	408 E Second	Muscatine	IA	52761	563.272.7865	
John Mitchell	Alcoa	4879 State St.	Bettendorf	IA	52722	563-459-2411	
Nate Bennett	ISAC	501 SW 7th St. Ste a	DSM	IA	50309	515-244-7181	
Terry Nitchman	Pella	102 Main St Pella	Pella	IA	50219	641 6216266	
Nicole Shalla	Plains Justice	100 First St SW	Cedar Rapids	IA	52404	319 3622120	
Ingrid Anderson	Plains Justice	"	"	"	"	"	
Amy Christensen	IUB	350 Maple St	Des Moines	IA	50319	515-281-6326	
Katie Allen	Iowa Health System	4488 112th St	Urbandale	IA		5152522621	
Danielle Hagerty	EMC Midwest		Des Moines	IA	50010	515-233-5485	
Doug Judge	Thompson Engineering	4950 Pleasant St.	West Des Moines	IA	50266	515-225-4203	515-225-4193
Bethany Wilcoxen	Des Moines Area MPO	6200 Aurora Ste 3000	Urbandale	IA	50131	(515)334-3075	
Lindsey Wandersheid	ISU	222 Power Plant	Ames	IA	50011	(515)291-0129	
Fred Van Scherpen	Deere & Co	217 Crestview	Waterloo	IA	50701		
Darin Oslund	GPC	1600 Oregon St	Muscatine	IA	52761	563.264.4570	
Bob [illegible]	EPA	901 N 5th	Kansas City	KS	66101	913-551-7245	

Please provide the information requested above. This will help ensure that we are able to provide you with any supplemental materials related to this meeting.

DNR

Meeting Attendance Record

DATE _____

Please Print

Name	Affiliation	Mailing Address	City	State	Zip	Phone	Fax
JEFF FLAGLE	IDNR	502 E. 9TH D.M. IA 50319				281-5353	281-8895
Scott Smith	Boone County	1208 224th Lane	Boone	IA	50036	433-0591	
Lain Pacini	Stanley Consultants		Cordville	IA	52241	319 626-3990	
Shannon Johnson	SSAB		Muscatine	IA	52761	563 381 8674	
LEE SEAGLES	IFC	521 E LOCUST SUITE 220	DM	IA	50309	515-244-1194	
Grant Meade	IRFA	5505 NW 88th	Johnston	IA	50023	515 252 649	
Kevin Blanshan	INRCOG	229 E Park Ave	Waterloo	IA	50703	319-235-0311	
Lisa Larson	Larson Engineering		Johnston	IA	50131	515-986-9778	
REX BUTZER	CIRCO	1400 HWY 13 SE	CEDAR RAPIDS	IA	52403	319 366 4512	
Charles Stanier	U Iowa		Iowa City			319-335-1399	
Chad Daniel	Stanley Cons	100 Court Ave Suite 300 DSM 50309	DSM	IA	50309	515-447-4411	
Jessica Hardy	City of Cities		DSM	IA		515 822 1315	

Please provide the information requested above. This will help ensure that we are able to provide you with any supplemental materials related to this meeting.

DNR

Public Hearing Attendance Record

Date: _____

Please Print Clearly

Name	Mailing Address	City	Zip	Phone	Email Address
Todd A. Scott	PO Box 2120	Iowa City	IA	319-338-1154	tscott@riverproducts.com
Kevin Blanshan	229 E Park Ave	Waterloo	IA	319-235-0311	
~~Lisa~~					
Tim McCollough	502 Carroll Ave	Ames	IA		tmccollough@city.ames.ia.us
~~REX BUTLER~~	~~1400 HWY 13 SE~~	~~CEDAR RAPIDS~~	~~IA~~		
MIKE VALDE	350 USB	IOWA CITY	IA	3193356190	michael-valde@uiowa.edu

Please provide the information requested above. This will help ensure that we are able to provide you with any supplemental materials related to this meeting.

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
6-21-10	Jay Llewellyn	Advanced	Marion B.	1:22	1:49
6-21-10	Mike Roe	"	"	1:22	1:49
	Chris Spelman	DNR		1:50	2:20
6/21/10	Pete Martin	REW Services	"	2:00	
6/21	[illegible]	IDNR	"	2:00	
6/21/10	Randall Wright	U.S.EPA	Marion B.	2:23	
6/21/10	Holly Vanderwal	FOH	marion	2:31	2:47
6/21/10	Kirk Martin	FOH	"	"	2:47
6/21/10	DAN J. STRE	FOH	Marion	2:31	~~2:36~~ 2:47
6-21-10	Frank Stanton	State of Iowa	Marion	2:55	
6-21-10	D. Cett	OFKon	Greg. H.	2:55	3:45
6-22-10	Justin Oesterreich	GPA	S. Fitzimmons	12:20	12:16
6-22-10	Mike Davis	"	"	"	12:16
6-22-10	Devin Kelly	Plains Justice	Dave Kelly	12:35	12:50
6/23/10	Terry Notch	Pella	PM 2.5	8:20	
6/23/10	Laura Liegois	ISOEO	PM2.5	8:32	
6/23/10	Tim Dougherty	I.E.H.A.	PM. 2.5	8:36	2:50
6/23/10	Scott Lesher	HAI CORPORATION	PM 2.5	8:40	2:50
6/23/10	Joe Sandfort	DNR	PM 2.5	8:40	
6/23/10	Tim Wickam	IDPH	PM 2.5	8:40	
6/23/10	James Nicholson	MMM	PM 2.5	8:43	2:45
6/23/10	Ryan Carlson	MMM	PM 2.5	8:43	2:45
6/23/10	Tom Sanetzka	SSAB	PM 2.5	8:46	2:45
6/23/10	Mike Sowd	Teagen	" "	8:48	12:30
6/23/10	REX BUTLER	CIPCO	" "	0850	1445
6/23/10	Sara Speser	ADM	PM 2.5	8:50	255
6/23/10	Kraig Allen	IHS	PM 2.5	8:51	
06/23/10	Nicole Shalla	Plains Justice	PM2.5	8:52	2:45
"	Ingrid Anderson	"	"	"	"
6/23/10	Fred Earley	Vermeer	PM 2.5	8:53	2:20
6/23	Greg Carmichael	U. Iowa	PM 2.5	8:55	
6/27	Joe McGuire	DMC	"	"	2:45
6/23/10	JEFF ROSS	CAMBREX CHARLES CITY	PM 2.5	8:55	2:50
6-23-10	Darin Oslund	GPC	2.5	8:56	2:45
"	FRED VAN DEN BERG	DEERE & CO	"	"	2:45
6/23/10	Nate Bonnett	ISAC	PM 2.5	8:57	2:45
6/23/10	Lindsey Wanderscheid	ISU	PM 2.5	8:57	2:55
6/23/10	Jeremy Becker	Polk Co.	PM 2.5	8:58	
6/23/10	Jennifer Van Hall	Gordon Clausen	"	9:00	2:45
6/23/10	Todd A. Scott	River Products Co.	PM 2.5	9:00	2:45
6/23/10	Marian Gelb	IEC	PM 2.5	9:00	
6/23/10	Tracy Casburn	EPA	PM 2.5	9:06	250
"	Josh Tapp	"	"	9:06	250

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
6/23/10	Jeff Gabby	Polk Co. AQD	PM2.5 Group	8:45am	2:46pm
6/23	Garrett Pedersen	IA DOT	PM 2.5	8:45	2:50
6/23	Tara Wetzel	Mathy Const	PM 2.5	8:50	
6/23	JEFF FIAGLE	IA DNR	PM 2.5	8:50	
6/23	Nicole Molt	ABT	DNR PM2.5	8:52	3:05
6/23	Danielle Hagens	DMG	DNR PM2.5	8:52	2:46
6/23	David Ferris	SIMECA	PM 2.5	8:52	2:50
6/23	Mark Landa	REC's	PM 2.5	8:54	2:53
6/23	Bethany Wilcoxen	DMAMPO	PM2.5	8:55	2:50
6/23	DON RAUKEN	MPW	"	8:56	14:45
6/23	Steve Rose	Des Moines/ZAMECO/ACTION	PM2.5	8:56	12:10
6/23	Mike Murphy	"	"	8:56	12:00
6/23	Tim McCollough	City of Ames	"	8:56	
6/23	Jan Lawson	DED	PM2.5	9:00	2:55
6/23	[illegible]	Sierra Club	PM25	9:00	3:10
6/23	Jeff Schmeh	FPA	PM2.5	9:10	
6/23	Chris Gruenhage	FB	PM25	9:00	2:50
" "	S. TIMMINS	DED	" /	" "	2:00
6/23	Heather Schebel	Schebel Environmental	PM 2.5 group	9:00	2:50
" "	Scott Smith	Boone County	" "	9:55	2:45
6/23	Jim Hoover	Linn County	PM25	8:59	
6/23	Tony Daugherty	Linn County	PM2.5	8:59	
6/23	Duane Coangwish	Iowa Cattlemen	PM2.5	9:00	
6/23	GENA MCCULLOUGH	BI STATE REGIONAL COM.	PM2.5	9:00	3:00
6/23	Jonny Mitchell	AI Coal	PM2.5	9:00	
6/23	Rich Stephens	ADM	PM2.5	9:00	2:52
6/23	Gene Taylor	Trinity	"	9:00	2:50
6/23	Jeff Kamm	IUB	PM2.5	9:00	11:25
6/23	Tyler Derry		Jim Craig	9 am	3 pm
6/23	Lain Paini	Stanley Consultants	PM2.5	9:05am	2:50
6/23	Bob McDonald	WASTE MANAGEMENT	PM2.5	9:10	3:00
6/23	Chandra Kavali	Dubuque RTPO	PM2.5	9:10	
6/23	Chris Raymond	Phoenix	PM2.5		
6/23	Bob Lathrop	EPA	"	9:10	
6/23	Mike Valle	U of Iowa	PM2.5	9:13	
6/23	Chris Petersen	IAO Farmstrong	PM2.5	9:15	2:45
"	Michael Li	Alliant	"	"	
6/23	Rose Christopherson	DOET	PM2.5	9:15	2:45
6/23	Jacek Kozid	ISU	PM2.5	9:15	
6/23	CATHY NICHOLAS	BLACKHAWK COUNTY	PM2.5	9:25	
6/23	Doug Judge	TEC	PM2.5	9:25	3:05

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
6/23	Jon Killer	MEC	PM 2.5	9:30	
6/23	Chad Daniel	Stanley Consultants	PM 2.5	10:30	2:45
6/23	Amy Christensen	IUB	PM 2.5	10:45	2:50
6/23	Shelby Olsen	MMM	PM 2:5	8:30	2:45
6/23	Mike Murphy	IKES	11 "	1:00	2:55
6/23	Kevin Slaughter	INRCOG.	PM 2:5	9:45	
6/23	Jessica Hardy	Leagues of Cities	PM 2.5	1:25	2:50

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
8/5/10	Jeff Gosky	Polk Co AQD	Tech / PM2.5	8:25am	1:20
8/5/10	SEAN WHALEN	ISU	PM2.5	8:41am	1:30
8/5/10	Pam Mackey Taylor	Sierra Club	PM2.5	8:45	1:30
8-5-10	Wally Taylor	Sierra Club	PM 2.5	8:45	1:30
8-5-10	Rich White	ILPA	PM 2.5	8:50	1:30
8-5-10	Doug Judge	TEC	PM2.5	8:50	12:00
8-5	Mark Lynch	Coops	PM2.5	8:50	1:30
8/4/10	Mike Valde	Clerk IA	PM 2.5	8:50	1:45
8/5/10	Sue Schmitz	IDRH	PM 2.5	8:50	1:20
8/5/10	Tara Wetzel	Hathy Const	PM 2.5	8:50	12:00
8/5/10	Laura Uerpois	ISDOT	PM2.5	8:52	1:45
8/5/10	Jennifer Van Hal	Gerdau Ameristeel	PM 2.5	8:57	1:35
8/5/10	Tim Wickam	IDPH	PM 2.5	8:57	
8/5/10	Tyler Bettin	IPPA	PM 2.5	8:58	
8/5/10	Danielle Hangens	OMG	PM 2.5	8:55	1:20
"	LEE SEARLES	TEC	"	8:55	1:45
8/5/10	Ryan Carlson	MMM	PM 2.5	9:00	1:25
8/5/10	Jon Koller	Mid American	PM 2.5	9:00	11:25
8/5/10	Tyler Perry		Jim Craig	9 am	
8/5/10	Jim Hodin	Lunn Conley	PM2.5	9 AM	
8/5	JEFF KAMAN	IOWA UTILITIES BD	PM 2.5	9:00	9:45
8/5	STEVE HOFF	ISU		9:01	1:27
8/5	Dennis Osland	GPC	PM 2.5	9:01	1:28
8/5	Luke Farris	Des Moines MPO	PM 2.5	9:01	1:25
8/5	Rick Robinson	IFBF	PM 2.5	9:02	1:40
8/5	JEFF ROSS	CAMBREX CHARLES CITY	PM 2.5	9:02	1:30
8/5	Gene Taylor	Trinity	"	"	1:25
8/5	Brian Thorn	CoA	PM 2.5	9:03	
8/5	Fred Fowler	Vermeer	PM2.5	9:04	
8/5	Matt Sahr	HNI Corp	PM 2.5	9:05	1:30
8/5	Lynn Tacini	Stanley Consultants	PM2.5	9:05	1:23
8/5	Gena McCullough	BiState Reg. Com	PM 2.5	9:15	2:45
8/5	Michael Li	Alliant	PM 2.5	9:30	2:00
8/5	Tim Dougherty	IEHA	PM 2.5	9:45	1:15
8/5	Jim Mitzschke	John Deere	PM 2.5	9:51	1:35
8/5	Jan Lapsow	DED	PM 2.5	9:55	1:25
8/5	Duane Langwish	ICA	PM 2.5	10:30	1:30

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
8/5/10	Garrett Pedersen	IDOT	PM 2.5	8:45	11:55
8/5/10	Kevin Blanshan	INRCOG	"	9:50	
8/5/10	Tom Samuels	SSAB	PM 2.5	8:55	1:45
8/5/10	Sara Speser	ADM	PM 2.5	9:55	2:30
8/5/10	Joe McGuire	OMC Industries	PM 2.5	8:55	1:20
8/5/10	Rich Stephens	ADM	PM 2.5	8:55	1:45
8/5/10	Sam Smith	Boone County	PM 2.5	8:56	11:51
8/5/10	Jessica Harden	ILOC	PM 2.5	9:00	11:30
8/5/10	Tony Daughenbaugh	Guan Coal	PM 2.5	9:2	2:05
8/5/10	Grant Menke	FRFA	PM 2.5	9:20	1:25
8/5/10	Tracey Cashburn	EPA	PM 2.5	9:22	
8/5/10	Nick Moa	ABS	" "	9:30	1:30

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
8/5/10	JOE SANFILIPPO	IPMR	B HUTCHINS	7:55	
8/5/10	DON PAUKER	MPW	PM2.5 WORKGRP	8:28	1:55
8/5/10	Terry Nolcham	Pella	pm 2.5	8:30	1:30
8/5/10	David Ferris	SIMECA	Pm 2.5	8:35	11:45
8/5/10	David Thompson	HEC	Mike Hermsen	2:10	2:20

PM2.5 Workgroup

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
9/2	Garrett Pedersen	Iowa DOT	PM 2.5	8:40	10:25
9/2	Tom Sanicola	SSAB	PM 2.5	8:45	11:30
"	F. Van Scheen	Deere & Co	"	"	11:30
9/2	Jennifer Van Hall	Gerdau Ameristeel	"	8:46	11:20
9/2	Kevin Blanshan	INRCOG	"	8:50	11:30
9/2	Jay Harmon	ISU	PM2.5	852	
9/2/10	Jeff Gabby	Polk Co. AQD	PM2.5	852	11:30
9/2/10	Tara Wetzel	Mathy Const	PM 2.5	8:53	11:15
9/2/10	Fred Egley	Vermeer	PM 2.5	8:55	11:23
9/2/10	Ryan Carlson	MMM	PM 2.5	8:55	11:20
9/2/10	Jan Spear	ADM	PM 2.5	8:55	11:30
9-9-10	Brian Thom	City of Ames	PM 2.5	8:57	11:20
9-2-10	Tracey Casbourn	EPA	PM2.5	8:58	12:05
9.2.10	Carmil Stone	IDPH	"	8:58	
9-2-10	Wally Taylor	Sierra Club	PM 2.5	8:58	11:15
9-2-10	Bob Webber	EPA	"	"	12:0[illegible]
9/2/10	Joe McGuire	OMC	"	8:58	11:20
9/2/10	Tyler Bettin	TPPA	"	9:00	
" "	Scott Smith	Boone County	"	9:01	11:11
9/2	James Hodne	Linn County	"	9:01	
9/2	Nicole Mott	ABI	"	9:03	10:0[illegible]
9/2	JEFF HAGLE	DNR	"	9:05	11:14
9/2	Bill Rosener	APAI		9:05	11:15
9/2	Chandra Pandit	Dubuque MPO	"	9:06	11:15
9/2	Michael Li	Alliant Energy	"	"	~~11:20~~

PM2.5 Workgroup

Date	Visitor's Name	Company Name	Whom Visiting	Time In	Time Out
	DAVID Ferris	SIMECA		8:42	11:11
9-2	Ryan Klass	Stanley Consultants		8:43	
9-2	Darin Osland	GPC		8:44	11:36
9/2	DON PARKER	MPW	PM2.5 Workgroup	8:46	11:34
9/2	Mick Durham	GPC		8:45	11:30
9/2	Tim Wickam	IDPH	PM2.5	8:45	
9/2	Jim Nitzschke	John Deere	PM 2.5	8:46	11:22
9/2	Rich Stephens	ADM	PM2.5	8:50	11:25
9/2	Bill Carnes	Martin Marietta	PM 2.5	8:55	11:30
9/2	Van Hoyson	D&D	"	8:55	11:15
9/2	Lindsey Wanderscheid	ISU	PM2.5	9:00	11:20
9/2	Pam Madary Taylor	Sierra Club	PM2.5	9:00	11:15
9/2	DANIELLE HAYNES	CMG	PM2.5	8:58	11:16
9/2	GENA MCCULLOUGH	BUSINESS REG. COM.	PM2.5	9:00	11:25
9/2	JEFF ROSS	CHAMBER CHARLES CITY	PM 2.5	9:00	11:15
9/2	Gary Dayhoff	Cinn Card	[illegible]	[illegible]	
9/2	Doug Judge	IEC	PM2.5	9:00	11:45
9/2	CEE SEARLES	IEC	"	9:00	11:30
9/2	Mike Dalle	UIA	"	9:10	
9/2	Gary Dorgan	D-G-C	"	9:10	11:20
9/2	Heather Schebel	Schebel Environmental	PM2.5	9:10	11:20
9/2	Grant Menke	IRFA	PM2.5	9:40	11:15
	Terry Nohl	Pella	"	10:20	11:30
	Bethany Wilcoxon	MPO	"	10:21	11:15
	Jessica Harden	ICAC	"	10:25	11:15

DNR

Meeting Attendance Record Date 7 Oct 2010

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Garrett Pederson	I-DOT					515-239-1210	garrett.pederson@dot.i
Jay Harmon	Iowa State U.	200 Davidson	Ames	IA	50011	294-0554	jharmon@iastate.edu
Kate Allen	IHS	4488 112th St	Urbandale	IA	50250	252-2021	allenkx@IHS.org
Chris Gruenhagen	FB	5400 Univ Ave	WDSM	IA	50266	2255528	cgruenhagen@iffb
Scott Young	Polsinelli	6201 College Blvd	OP	KS	66213	913-451-8788	syoung@polsinelli
Rich White	ILPA	5911 Meredith	DM	IA	50322	262-8668	rwhite@innovationlawpa.org
Tara Wetzel	Mathy	920 Ave N	Onalaska	WI	54650	608-779-6320	twetzel@mathy.com
Tracey Casburn	EPA						
Jacob Morgan	IAMU		Ankeny	IA	50021		
Doug Judge	TEC	4950 Pleasant St	West Des Moines	IA	50265	515-225-4703	djudge@tecenv.com
Jeff Ross	Cambrex Charles City	1205 11th St.	Charles City	IA	50616	641-257-1059	jeff.ross@cambrex.com
Jenny Van Hall	Gerdau Ameristeel	1520 W. Third St	Wilton	IA	52778	563 732 4650	jvanhall@gerdauameristeel.com
Sara Speser	ADM	1935 E Euclid	Des Moines	IA	50320	515-263-3285	sara.speser@adm.com
Lindsay Wanderscheid	ISU	222 Power Plant Bldg	Ames	IA	50011	515-291-0129	lwander@iastate.edu
Joe McGrum	OMG	Lee Grand		IA			
Jon Keller	MEC					281-2612	
Pam Mackey	Taylor Sierra Club		Marion	IA	52302	319-366-2428	
Wally Taylor	Sierra Club		Marion	IA	52302	319-366-2428	
Jim Hodne	Linn County		CR	IA	52405		
Mark Durham	GPC						
Darin Ostlund	GPC		Muscatine	IA	52761		

DNR

Meeting Attendance Record Date 7 Oct 2010

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Chad Daniel	Stanley Cons.	100 Court Ave, Suite 300	DSM	IA	50309	447-4411	danielchad@stanleygroup.com
Mike Bonnett	ISAC	501 SW 7th Ste. Q	DSM	IA	50309	244-7181	mbonnett@iowacounties.org
Sue Schmitz	IDPH		DSM				sschmitz@idph.state.ia.us
Jan Koupal	IDED		DSM	IA			~~koupal@iowa.com~~
Ryan Carlson	MMM		DSM	IA	50322	515 254 0030	
Lisa Larson	Larson Engineering	6604 Lom Rd CR	Johnston	IA	50131	515 986 9778	lisa@larsoneng.com
Beth Kephart	MMM		Alden	IA			
Terry Nobiha	Pella	102 Main	Pella	IA		641 621 6266	
Danielle Thoma	OMG		Grande	IA			
Lee Searles	IEC		DM	IA			
Fred Early	Vermeer		Pella	IA			fearley@vermeer.com
Grant Meike	IRFA		Johnston	IA	50131	515 252-6249	gmeike@iowarfa.org
Tim Dougherty	IEHA		Davenport	IA			
Jerry Mitchell	Alcoa		Davenport	IA			
CATHY NICHOLAS	BLACKHAWK CO.					319 833 3008	
Lori Pacini	Stanley Consultants		Coralville	IA	52240	319 621-3374	pacinilori@stanleygroup.com
Rich Stephens	ADM		CR	IA	52404	319-398-0735	rich.stephens@adm.com
Shane Dodge	LCPH		CR	IA	52405	319 892 6015	
Tony Dougherty	LCPH		CR	IA	52405	319 892 6015	
Gary Dodge	DEC		Delhi	IA	52242		
Michael L.	Alliant		CR	IA			
Nicole Molt	ASI						

DNR

Meeting Attendance Record Date 7/oct/2010

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Jeff Schnell	IPPA		Clive	IA		225-7675	
MIKE VALDE	U of IA	350 USB	IOWA CITY	IA	52242	319-335-6190	
Bethany Wilcoxon	DMAMPO						
Tim Wickam	IDPH	Lucas Bldg	Des Moines	IA			
Don Paulsen	MPW						
David Ferris							

PM2.5

PM2.5 workgroup 11-18-10

DNR

Meeting Attendance Record **Date** _____

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Joe Sanfilippo	IDNR	909 W MAIN	MANCHESTER	IA	52057	563-927-2640	joe.sanfilippo@dnr.gov
Wally Taylor	Sierra Club		Cedar Rapids	IA			
Pam Mooday Taylor	Sierra Club		Cedar Rapids	IA			
Sarah Hatch	EPA		KC	KS			Hatch.Sarah@epa.gov
D. Ferris	SIMECA						
Terry Nolton	Pella		Pella	IA			
Bob Patrick	EPA						
Nicole McAt	ABI		DSM	IA			
Chris Gruenhagen	FB		WDSM				
Tony Daybourg	Gin Cooley		CR	IA	52405	3198920017	
Jeff Gabbu	Polk Co AQD		Des Moines	IA	50322	5152863389	jeffrey.gabbu@polkcounty.iowa.gov
Rick White	ILPA		~~Des Moines~~	IA			
Sue Schmidt	IDPH		"	"	50319	515281-8707	
Joe McGuire	OMC						
Mark Landa	Cooper		"	"	50322	515 247-4718	
Don Parker	MPW		MUSCATINE	"	52761	563 262 5374	
Jeff Ross	Cambrex		Charles City	IA	50616	641/257-1659	
Ryan Carlson	MMM		DSM	IA			

DNR

Meeting Attendance Record **Date** _____

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Rich Stephens	ADM CR	1350 Waconia Ave	CR	IA	52404	319-398-0785	
Jacob Nason	JK Smith Law						
LEE SEARLES	IEC		DM				
Jennifer Vaughn	Gordon	1500 W Third St	Waterloo	IA	52705		
Scott Smith	ISSWD						
Jess Vilsado	MEC		DSM	IA			
Kenny Sadoge	TEC	4950 Pleasant St	WDM	IA	52266		
Gary Douglas	DEC			IA	52242	563-659-4921	
JESS KARMAN	IUB	350 MAPL ST	Dm	IA	50319	515-281-3279	
Kelly	MEC						
Tim Wickam	IDPH					515-281-7462	
Mike Swift	IAWU						
Duane Gangwish	ECA	~~Ames~~	Ames	IA		515-296-2264	
MIKE VALDE	U of I	350 USB	~~Iowa City~~	IA	52242	319-335-6190	

DNR

Meeting Attendance Record **Date** _____

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Jan Lopow	DOE						
Tracey Cathum	EPA-R7						
CATHY NICHOLAS	BLACKSTONE	AIR QUALITY Mtg					
Sharon Tatitmer	DNR	AQ Mtg					
Michael Li	Alliant Energy						
Grant Kecko	IRFA	PM2.5					
Jeff Schnell	IPA	"					

DNR

Meeting Attendance Record **Date** _____

Name	Affiliation	Mailing Address	City	State	ZIP	Phone	E-mail
Trevor Van Schuyver	Deere & Co						
Gene Taylor	Trinity						
Nate Bennett	ZGAC						
Lain Pacini	Stanley Consultants		Coralville	IA	52317		
Denise Hagging	OMG		Urbana	IA			
Chrissy Wolfersberger	EPA R7						
Fred Eacley	Vermeer						
Darin Osland	GPC						
Lindsey Wandescheid	ISU		Ames	IA			
John Mitchell	Alcoa						
Beth Crphard	MMM						