



Fine Particulate Matter (PM_{2.5}) Update

Presentation to: Fairbanks North Star Borough Assembly Committee of the Whole

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DEC
Air Quality

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Overview



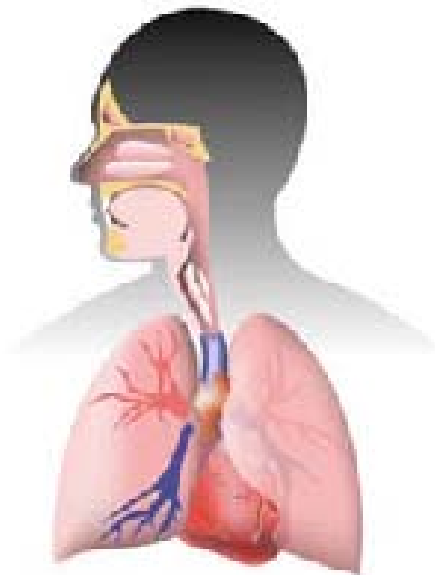
Purpose of the Presentation

- Updates since last year's presentation (2/18/2016)
- Serious SIP
 - Challenges
 - Timeline
 - Potential Additional Controls



Health Impacts of High PM_{2.5} Concentrations

- FNSB does not meet health standards. Air Quality Plans or SIPs identify community actions to meet health based standards.
- PM_{2.5}, due to its small size has the following health impacts:
 - Increased respiratory symptoms (coughing or difficulty breathing)
 - Aggravated asthma
 - Development of chronic bronchitis
 - Nonfatal heart attacks
 - Increased visits to medical facilities
- Sensitive populations:
 - Elderly
 - Children
 - Individuals with medical conditions





Update - Monitoring

- DEC operating regulatory monitors (FRM) and continuous analyzers (BAM) that are used to call alerts and advisories (July 2017)
- NCore, State Office Building, North Pole Fire Station #3
- FNSB operating the low cost MetOne monitoring equipment (15 deployed)
- Saturation Study



Updates - Moderate SIP

- Moderate Area SIP submitted to EPA in December 2014.
- EPA proposed full approval of Moderate SIP. (No conformity freeze.)
- Published in the Federal Register today (Feb 2). Public comment period ends March 6.
- FNSB air quality ordinances in 2015 and 2016 were a critical component of EPA's preliminary finding.



Moving Forward

- Serious Reclassification Expected
 - EPA proposed to reclassify in Dec 16, 2016
 - EPA must make final decision by April 28, 2017
- Serious State Implementation Planning (SIP) Challenges
 - PM_{2.5} Implementation Rule
 - December 2017 Deadline
- More strict controls will be needed



Serious SIP



New PM_{2.5} Implementation Rule

- New PM_{2.5} Implementation rule lays out specific requirements for PM_{2.5} and its precursors.
- Based on the rule, the Serious SIP will be a major effort.
 - Moderate SIP was based on reasonable control measures
 - Serious SIP will be based on best and most stringent control measures
 - Increased amount of documentation and evidence required
 - New rule clarified the requirements to control not only direct PM but also the precursors (NO_x, SO₂, VOCs, Ammonia). So some control measures may be difficult to comprehend by public because they control a precursor vs wood smoke.
 - New rule has some benefits: Precursor Demonstration. Precursor Demonstration Guidance currently out for public comment. A successful demonstration could mean limited or reduced control requirements - example ammonia.



Serious Nonattainment Area SIP

- Serious Area SIP must:
 - Include all control measures for all sources (area sources, point sources, mobile sources)
 - Unless found to be technically or economically infeasible
 - What has been implemented in other areas sets the level of expectation for the control measure test.
 - Include Best Available Control Technology on all major point sources
 - Demonstrate attainment by 2019, unless an extension is requested.
 - If extension requested, must be included in SIP at time of submittal and include framework for Most Stringent Measures (MSM).
 - Include Reasonable Further Progress (RFP) milestones for PM_{2.5} and Precursors. Failure to meet RFP milestones triggers contingency measures.



Control Measures

- DEC reviewed other states and communities':
 - PM_{2.5} SIPS
 - Regulations
 - Ordinances
 - Included areas that are in attainment
- Developed a large list of control measures from this review
- Submitted list to FNSB Air Quality program
- List shows control measures from other areas that need to be analyzed and implemented in FNSB.
- Any control measure not implemented will need documentation that it is technologically or economically infeasible OR how an “Alaskanized” measure is equivalent.



Control Measures continued

- Examples of types of control measures in other areas (not complete list)
 - Curtailment at lower concentration threshold.
 - Date certain removal of all uncertified solid fuel fired devices
 - Surcharge on device sales
 - Installations only by certified installers
 - Require installation of thermal mass for new or existing outdoor hydronic heaters
 - Prohibit advertising of used devices
 - Zero visible emissions during curtailment
 - Registration and inspection of devices to qualify for exemptions from curtailments or to remain in place
 - Prohibit new installation of hydronic heaters or coal fired devices
 - Require sale of dry wood only during late summer to end of winter
 - Prohibit use of used oil
 - I/M program
 - Require only low sulfur oil for all sources (home heating, point sources)



Control Measures continued

- Three Types of Control Measures – BACM, MSM, Contingency
- BACM = ‘Best’ Available Control Measures
 - Serious SIP requires BACM
 - ‘Best’ is typically defined by what has been implemented in other areas
 - Challenge will be documenting or coming up with ‘equivalencies’ between FNSB control measures and Lower 48 control measures and then proving the equivalency for EPA’s approval.
 - Control measures implemented before December 2019 and meet the ‘Best’ test is considered BACM.



Control Measures continued

- MSM = Most Stringent Measure
 - MSM is a control measure that can't be implemented before 2019, but must be implemented before any new attainment date.
 - MSM's are measures that usually require more lead time to implement
 - MSM framework must be included in a Serious SIP if requesting an extension of the attainment date beyond 2019
 - Only one extension request may be submitted – 1 year increments up to 5 years total.
 - Example of a possible MSM – date certain removal of all noncertified devices in nonattainment area. Removing all devices by 2019 may not be possible but removing all devices between 2019-2024 may be possible.



Sanctions

- Sanction Clock starts when EPA determines there has been:
 - Failure to submit a SIP
 - A SIP was submitted and found to be incomplete
 - A SIP has been found complete but is disapproved or partially disapproved
 - A failure to implement a committed measure in an approved SIP
- Three Sanction Clocks
 - 18-months – until first sanction – likely 2:1 offsets
 - 24-months – until second sanction – likely federal highway funds
 - 24-months- until Federal Implementation Plan
- Clocks may reset or pause depending on issue and remedy
- These sanctions are in the Clean Air Act



Saturation Study



Saturation Study

- Goal

Make the needed measurements necessary for evaluating the spatial characteristics of ambient $PM_{2.5}$ concentrations across the North Pole area during wintertime episodes.

- To identify ambient $PM_{2.5}$ concentrations residents are being exposed to beyond the NPFS monitor; and
- To evaluate where a new monitor could be placed, if necessary, to better represent neighborhood scale impacts.

Organization:

- DEC: Technical Assistance, Outreach, Funding, Oversight
- FNSB: Technical Assistance, Site selection, Outreach
- Sierra Research: Project Planning and Management, Data Analysis,
- T&B Systems: Equipment Selection, Data Collection, Quality Assurance



Saturation Study Design

- Based on hourly BAM data collected at the NPFS monitoring station from 2013-2015
- Fixed-Site Monitoring
 - Twelve fixed-site monitors will be placed and operated continuously during the study period.
 - Extend roughly 2 miles outward from the NPFS site
- Mobile Monitoring
 - Using a vehicle equipped with a real-time $PM_{2.5}$ monitor that will be used for “virtual site” data collection.
 - Data at these fixed locations along the traverse will be accumulated and averaged over the hour to provide hourly average concentrations at the “virtual sites.”
 - Provides a very dense network of sites to directly address and answer questions about small scale variations that may be associated with local sources and microscale phenomena in the region.

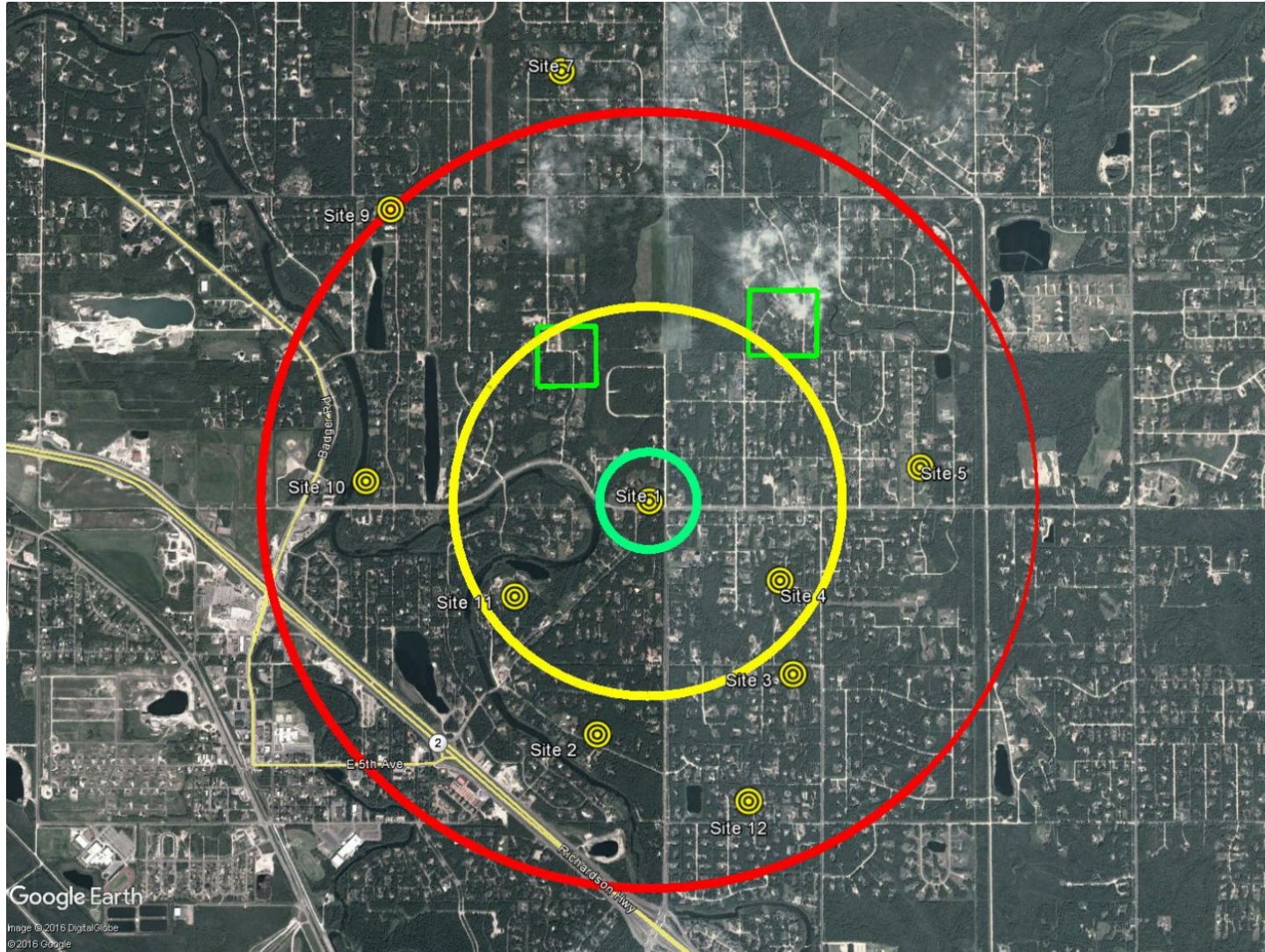


Saturation Study: Equipment and Timeline

- Thermo Personal Data Ram (pDR) Model 1500 samplers will be used for all PM_{2.5} measurements
 - Used for stationary and mobile monitoring
 - Same as 'sniffer' vehicle set-up
- 2 Additional meteorological sites
- 3 week study in February
 - Some daily PM_{2.5} concentrations > 35 µg/m³
 - Some daily average temperatures < -15°F.
- Final report expected by early fall 2017

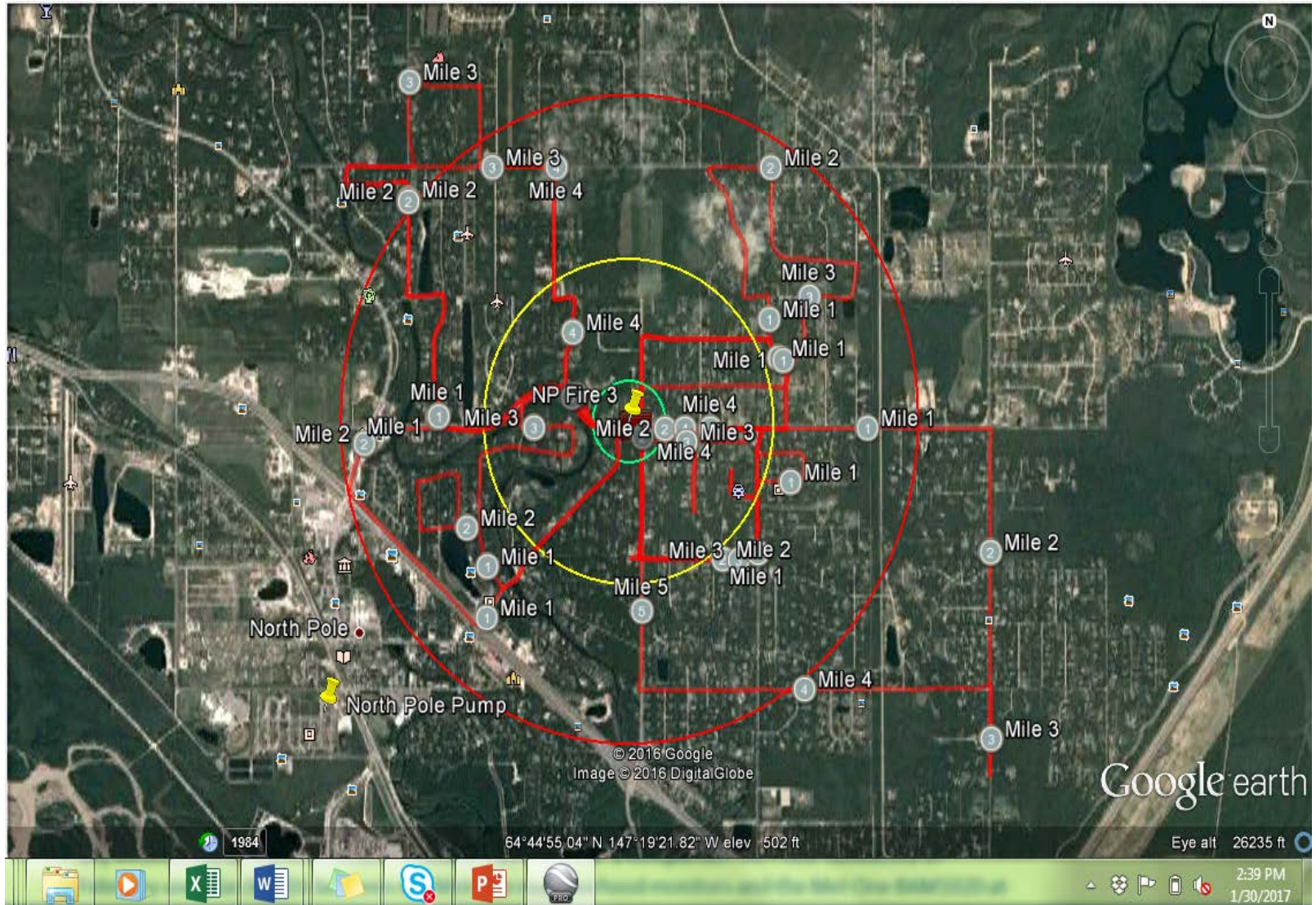


Proposed Location of Stationary Sites





Proposed Mobile Monitoring Routes





Questions?

Thank You!

For more information:

http://dec.alaska.gov/air/anpms/comm/fbks1_pm.htm