

# Air Quality Management in Saskatchewan – Transitioning From Facility Based Monitoring to Airzone Management

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Saskatchewan Ministry of Environment



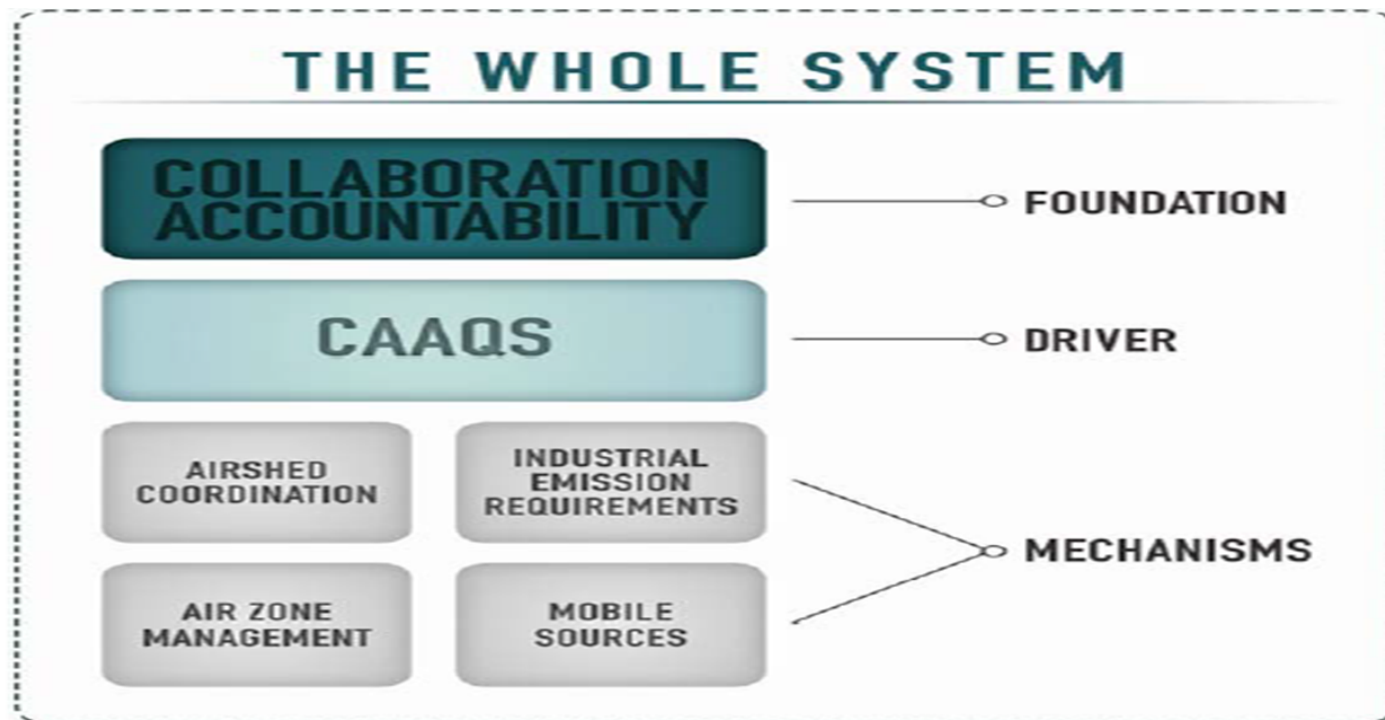
# Presentation Overview:

- Airzone Management Origins
- Airzone Management in Saskatchewan to Date
- Ministry of Environment – Airzone Management Support
- “Successful” Airzone Management – An Industrial Regulator’s Perspective

# Background of the Canada-wide AQMS

- On October 11, 2012, the Canadian Council of Ministers of the Environment (CCME) agreed to implement the Canada-wide Air Quality Management System (AQMS) in 2013
- The primary objective of the AQMS is to achieve better air quality for improved human health and environmental benefits
- One of the first implementation measures was for provinces and territories to divide their respective jurisdictions into local air zones

# Canada-wide Air Quality Management System





# Regional Airsheds



# Canada-wide AQMS BLIERS

- Most of the AQMS elements are non-controversial and supported by federal, provincial and territorial jurisdictions, with the exception of selected Base Level Industrial Emission Requirements (BLIERS).
- The objective of SK MOE is to not duplicate regulatory efforts but to maintain a one-window approach with the Government of Saskatchewan as the lead regulator
- Saskatchewan's Ambient Air Quality Standards will adopt the Canadian Ambient Air Quality Standard for PM 2.5 and ozone
- Saskatchewan plans to adopt BLIERS as part of its regulatory approach

# What is an Air Zone?

- Air zones are geographic areas within jurisdictions that exhibit similar air quality profiles and challenges
- Air zones are a provincial/territorial responsibility
- Province/territories have been delineated according to their own unique air quality circumstances and local air quality management actions

## What is Air Zone Management?

- Air zone management approach is a successful program built on consensus-based decision-making and partnerships
- A non-profit society is formed with representation from industry, government, non-government agencies and the public
- A collaborative process ensures open dialogue and informed decisions
- Air zones collect and provide air quality data to the public in real-time, via websites
- Membership in the air zones is voluntary with industry members sharing funding responsibilities for monitoring programs

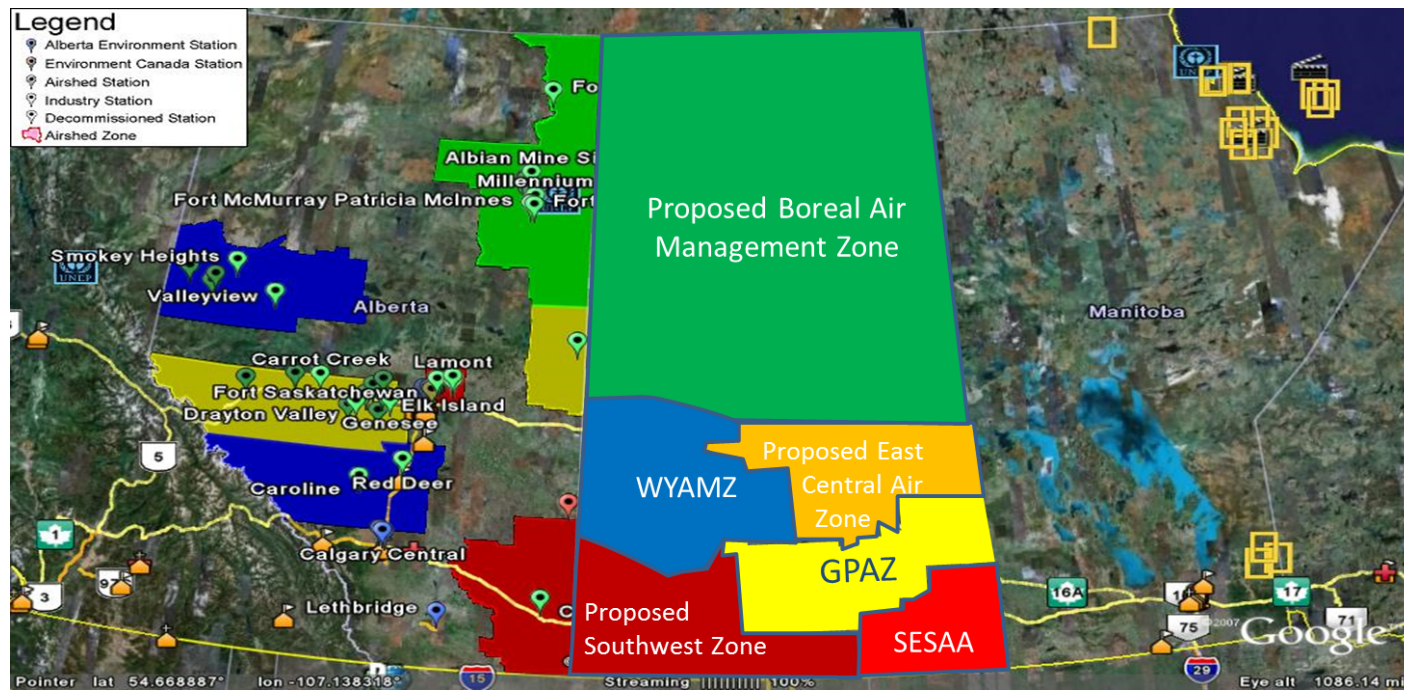
# Benefits of Air Zone Management

- Generates credible data to help manage regional air quality
- Spreads program operating costs among emitting stakeholders
- Creates high public trust due to the open process and direct public involvement
- Provides access to real-time air monitoring data via the internet
- Offers an effective forum for open discussion
- Provides opportunity to build relationships among stakeholders
- Provides an excellent public relations and education tool

## Saskatchewan designed air zones based on:

- degree of threat to air quality reflected by the number and distribution of air emitters
- identification of local and regional air issues
- National Pollutant Release Inventory (NPRI) data
- non-point sources and other potential contributors
- meteorological data
- administrative boundaries
- sufficient number of emitters to financially support the air zone

# Saskatchewan Airzones

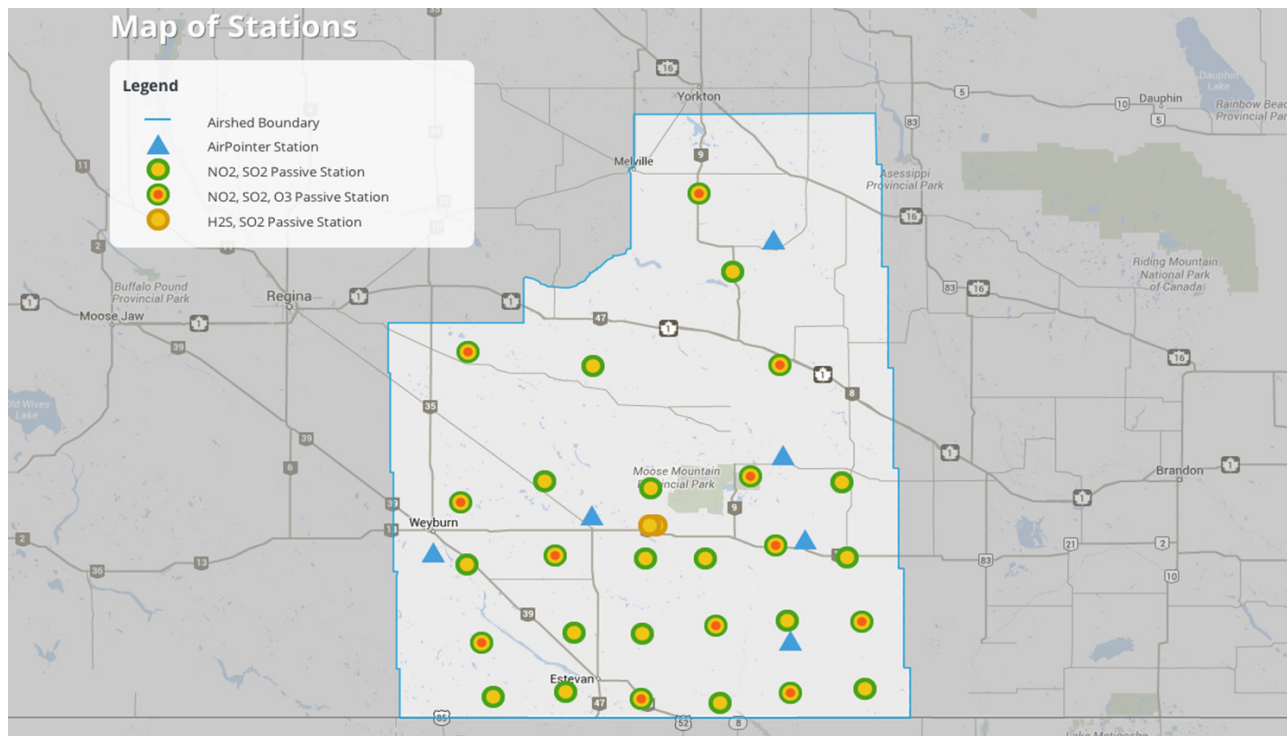


# Saskatchewan Air Zone Update

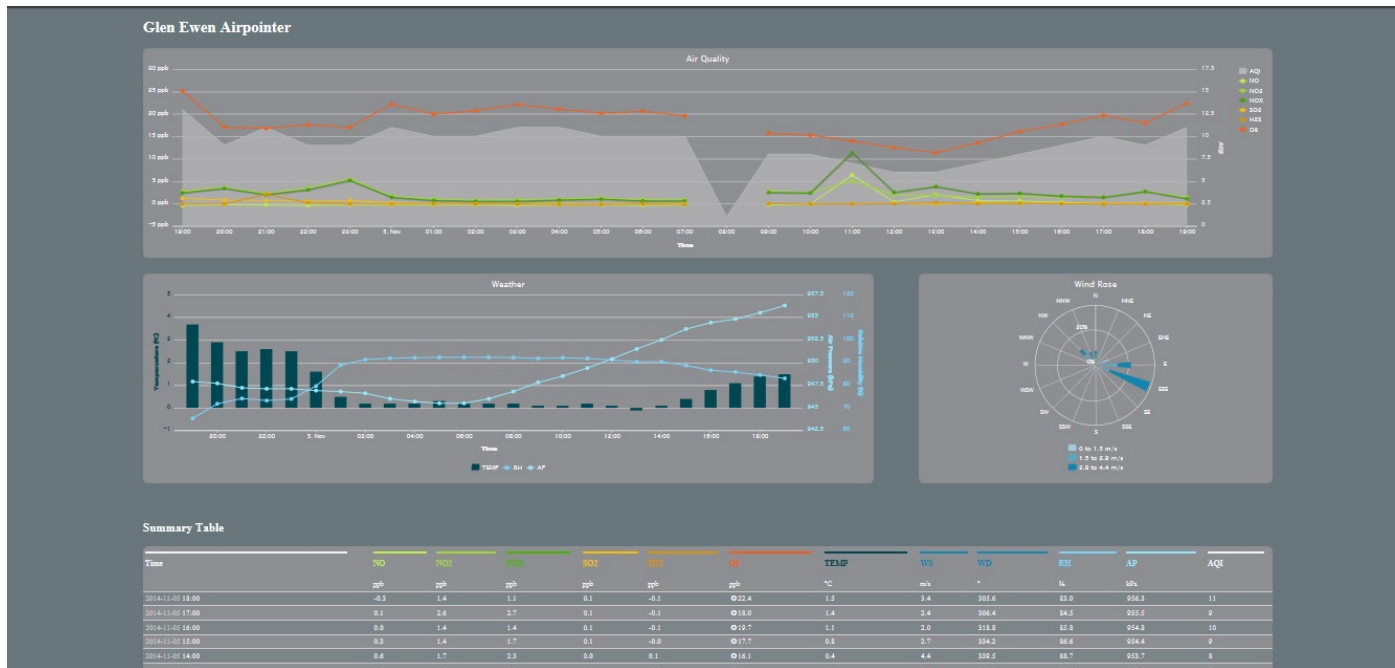
- South East Saskatchewan Airshed Association (SESAA)
  - Six continuous air monitoring stations measuring NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>S, ozone, PM<sub>2.5</sub> and met data
  - Discontinued passive network at the end of September since the airpointer coverage is sufficient and air zone funding is not able to afford both networks
  - SaskPower is looking to SESAA to operate their Estevan monitoring station
  - Please check out [www.sesaa.ca](http://www.sesaa.ca).
- Western Yellowhead Air Management Zone (WYAMZ)
  - Four new continuous air monitoring measuring NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>S, ozone, PM<sub>2.5</sub> and met data
  - In addition, the ministry operates a National Air Pollution Surveillance (NAPS) station in Saskatoon and a continuous station in North Battleford
  - 14 Passive Monitoring Stations
  - Please check out [www.wyamz.ca](http://www.wyamz.ca).
- Great Plains Air Zone (GPAZ)
  - The ministry operates a NAPS station in Regina



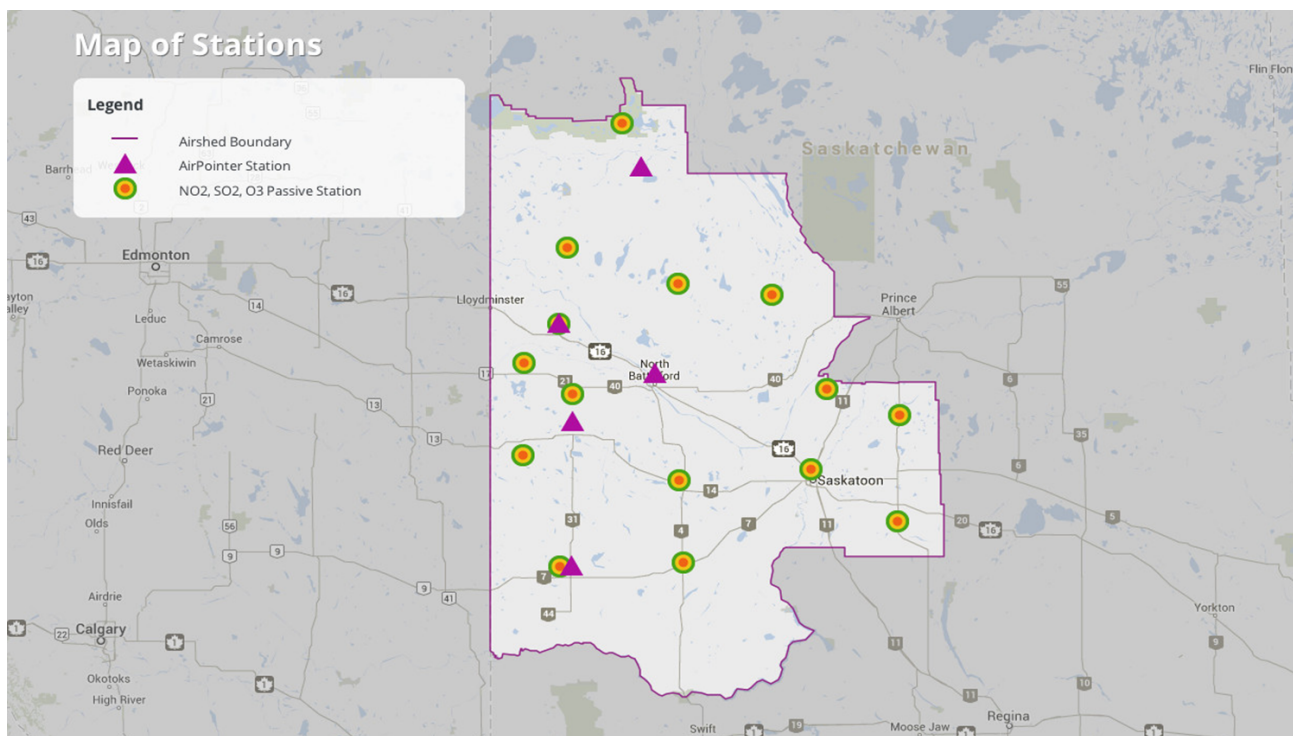
# SESAA Air Monitoring Stations



# SESAA Website Display



# WYAMZ Air Monitoring



# Air Zone Management Teams

GPAZ	SESAA	WYAMZ
Potash Mining Petroleum Refining Steel Production Health Regions Municipal ENGO SK Environment	Potash Mining Coal Mining Coal Power Upstream Oil & Gas Health Regions Municipal ENGO - vacant First Nations - vacant SK Economy	SK Mining Association Petroleum Refining Upstream Oil & Gas Municipal ENGO Academia First Nations - vacant SK Agriculture SK Economy SK Environment

# Path Forward

- Ministry officially sets up Saskatchewan's largest air zone - the Boreal Air Zone
  - its projected the northern air zone will have Board participation from mining, First Nations, Health and an ENGO
  - air monitoring currently being done by industry, the Federal Government and the ministry
- Ministry to introduce the final two air zones to local stakeholders- the southwest and east central air zones
  - ministry to hold public stakeholder meetings in the Cities of Swift Current and Prince Albert - both cities have National Air Pollution Surveillance (NAPS) sites
- Ministry provides seed money to pay for start-up costs for all three new air zones
- Ministry to conduct an Air Quality Study in the City of Saskatoon

## Airzone Management vs. Facility Specific Monitoring

- Data collected through airzone management is supposed to reflect general air quality in an area, rather than monitor facility emissions
- Facility's are regulated at fenceline for potential ambient air impacts off property
  - Large Industrial Operations are required through an "Approval to Operate" to conduct their own ambient air quality monitoring
  - Small Industrial Operations are often required by permit/approval to provide stack testing results – ambient air monitoring is usually complaint, or compliance driven

# Facility Specific Monitoring: Refineries

- COOP Refinery Complex
  - Two continuous ambient air monitors (H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>x</sub> & TPH)
  - 6 passive sampling locations (H<sub>2</sub>S, SO<sub>2</sub>, PM)
  - 6 Suma canister locations (VOCs)
- Lloydminster Husky Upgrader
  - Two continuous air monitors (H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>x</sub>)
  - 7 passive sampling locations (H<sub>2</sub>S & SO<sub>2</sub>)
- Moose Jaw Asphalt Refinery
  - 15 passive sampling locations (H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>x</sub>, Benzene)
  - Continuous monitoring capabilities to be in place by 2015

## Airzone Membership Impacts on Large Industrial Operations

- Lloydminster Husky Upgrader
  - Continuous Monitoring Network has remained in place and has remained a requirement through SK MOE issued Approval to Operate
  - Airzone has provided option to member industry's to “donate” existing equipment to the airzone



## Airzone Management – Ministry of Environment Support

- Saskatchewan has incorporated two additional ‘tools’ to support airzone management
  - Mobile Air Monitoring Lab
  - Comprehensive air quality studies within areas where emission sources are numerous and cumulative

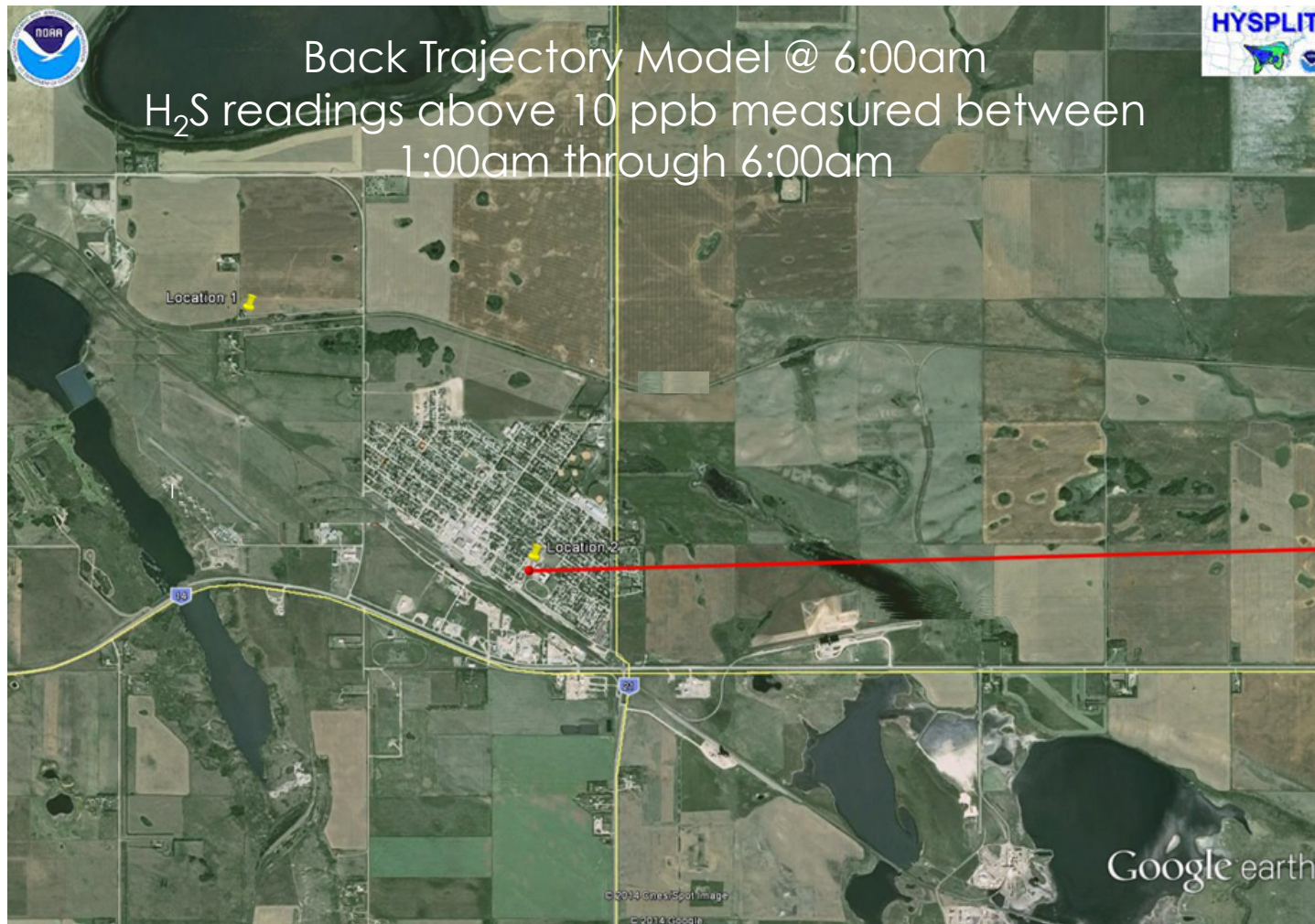
# Saskatchewan Air Monitoring Laboratory (SAML)



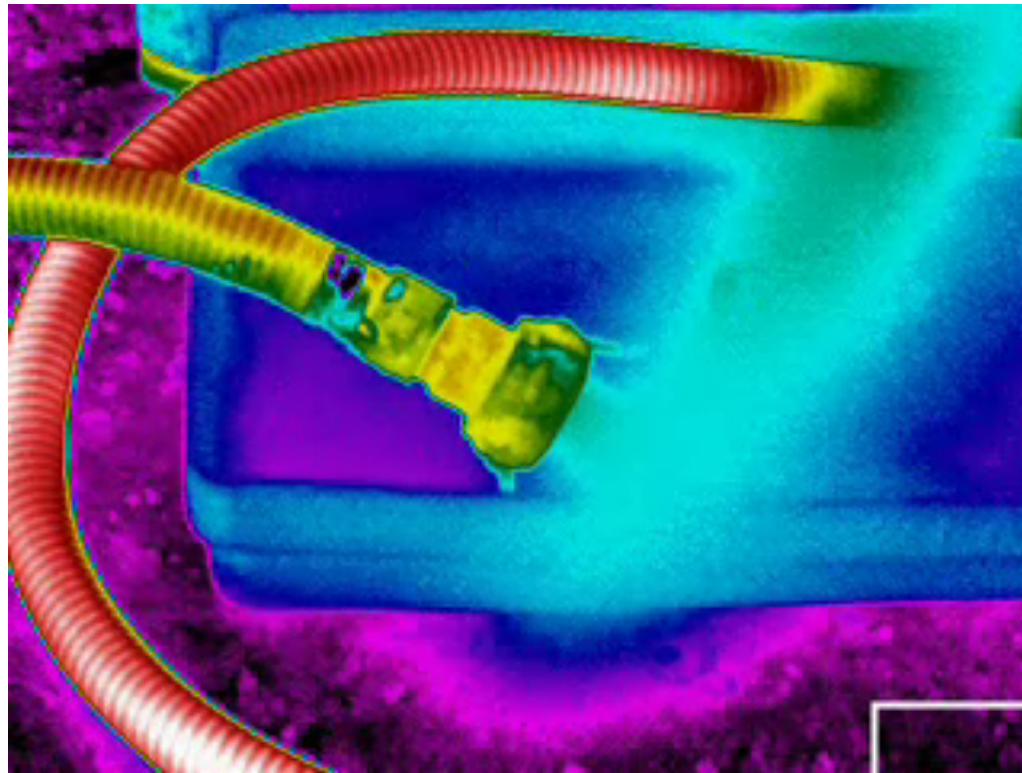
# Case Study

- Ministry of Environment handling complaints related to H<sub>2</sub>S emissions within the Town
- Transloading operations are located within the Town
- An ethanol plant and salt mine both operate wastewater ponds
  - Fugitive Emissions were not considered when airzone decided on monitoring location and parameters

# SAML Data Collection



# SK Ministry of Environment - Inspection

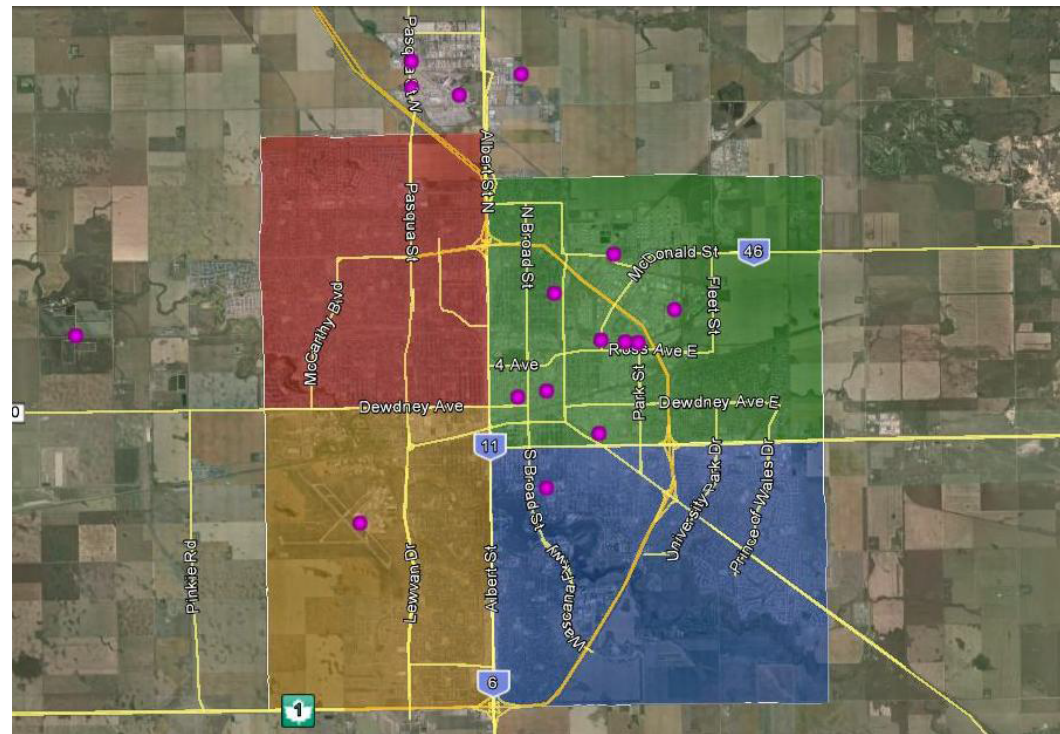




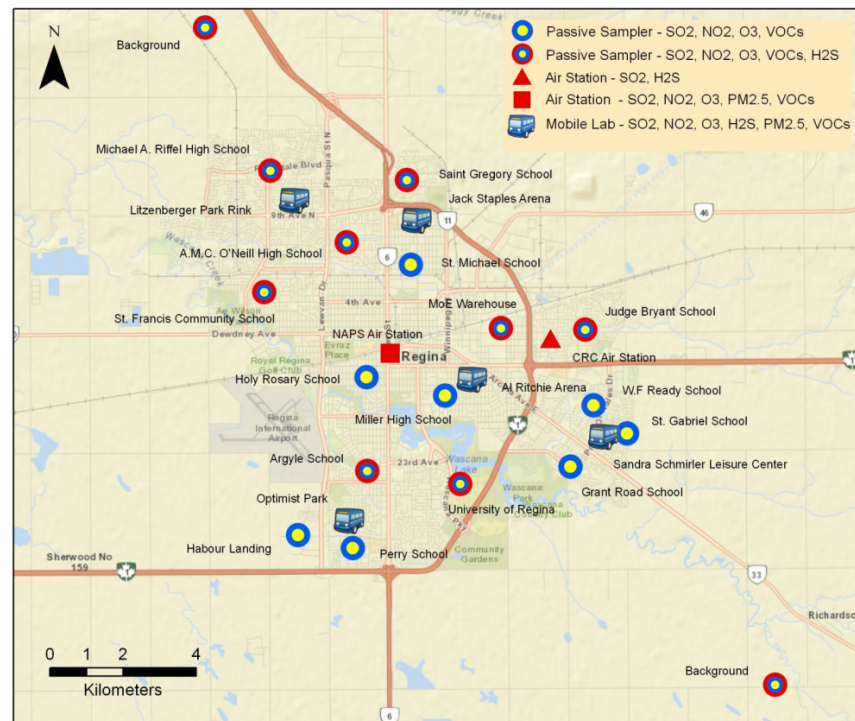
# City of Regina Air Quality Study

- SK MOE, SK MOH, Regina Qu'Appelle Health Region and the City of Regina Initiative
- Monitoring Conducted between July 2012 and August 2013
- Purpose
  - Provide baseline data to compare with possible future monitoring studies
  - Proactively identify potential pollutant of concern before they become a problem
  - Assist with identifying where additional permanent monitoring stations should be located

# City of Regina Air Quality Study – Industrial Emitters



# City of Regina Air Quality Study – Monitoring Locations





# Regina Air Study: Contaminants of Concern

- H<sub>2</sub>S
  - Stagnant natural water
  - Natural gas and petroleum production
  - Wastewater treatment
  - asphalt manufacturing
- SO<sub>2</sub>
  - Large Industrial Fuel Burning Operations
  - Refineries and upstream oil & gas operations
- NO<sub>x</sub>
  - automobiles
  - Industrial Fuel Burning Equipment

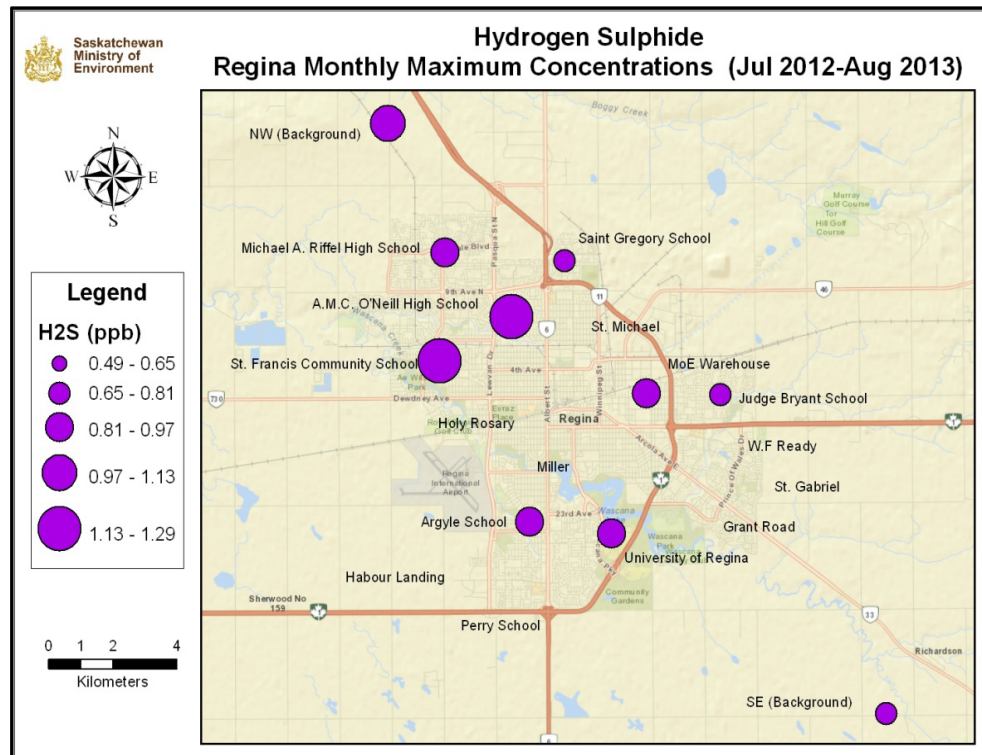
# Regina Air Study: Contaminants of Concern

- VOCs
  - Natural occurring methane
  - Processing and burning of hydrocarbons
  - Fugitive emissions from upstream and downstream oil & gas operations
- Ozone
  - Downward transport from stratosphere
  - Photochemical rxns with NOx and VOCs
- PM<sub>2.5</sub> & PM<sub>10</sub>
  - Forrest fires
  - Gravel road dust
  - Combining
  - Stubble burning
  - Motor vehicle exhaust
  - Industrial and residential combustion

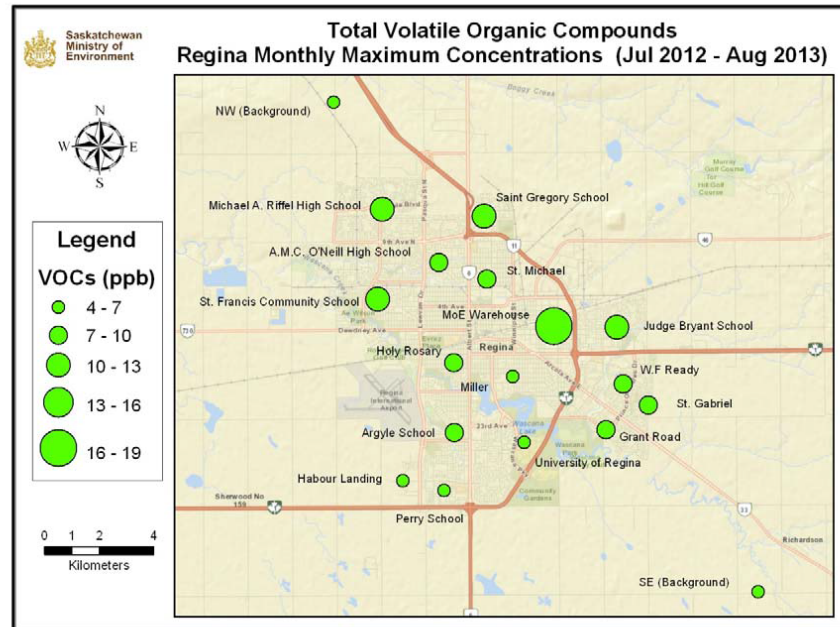
# City of Regina – Smoke Event



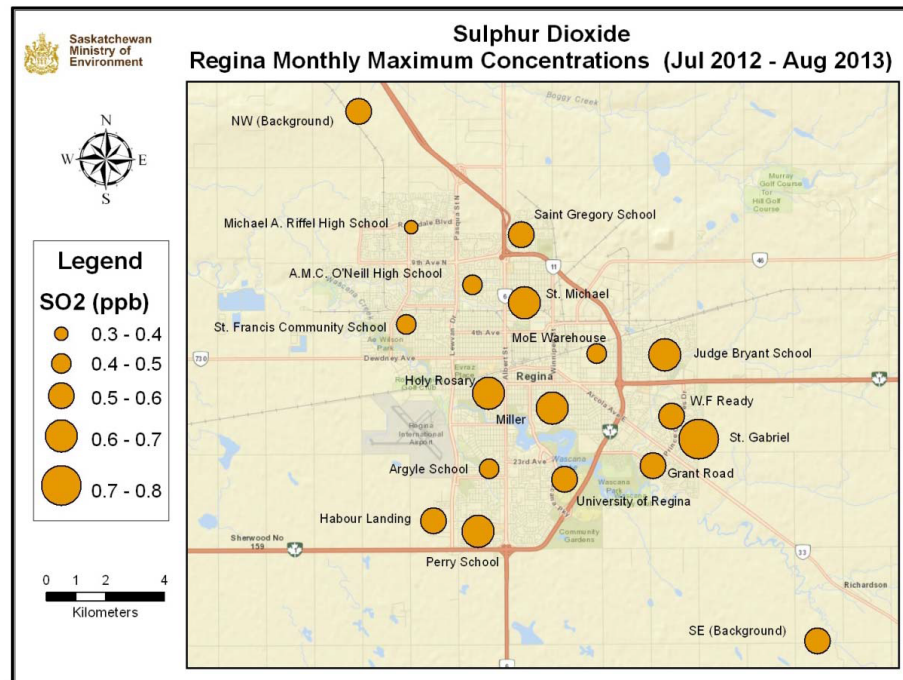
# City of Regina Air Quality Study - Results



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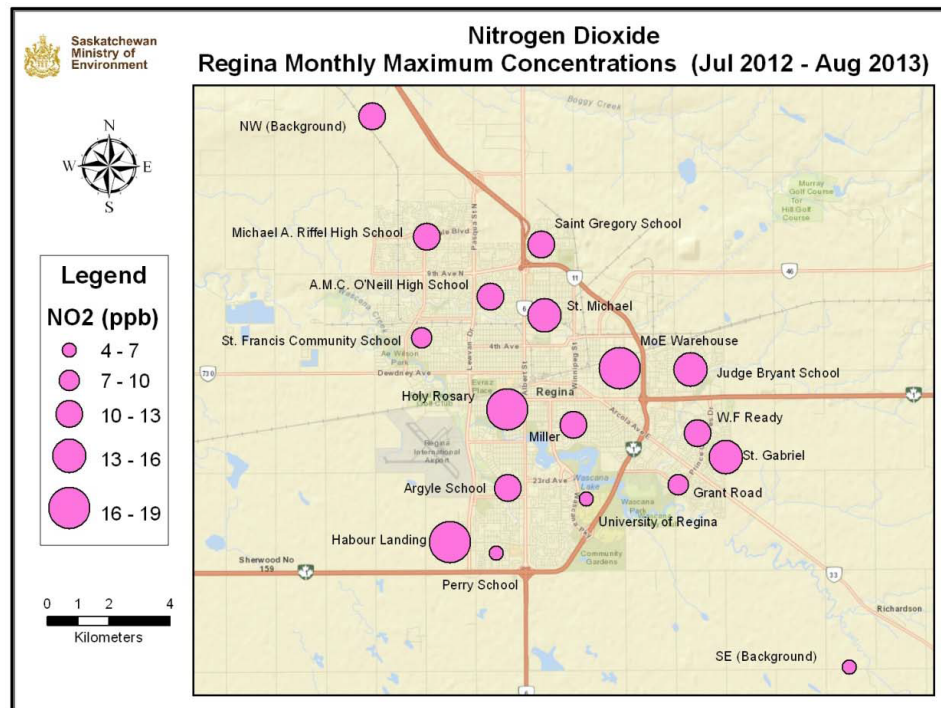


# City of Regina Air Quality Study - Results

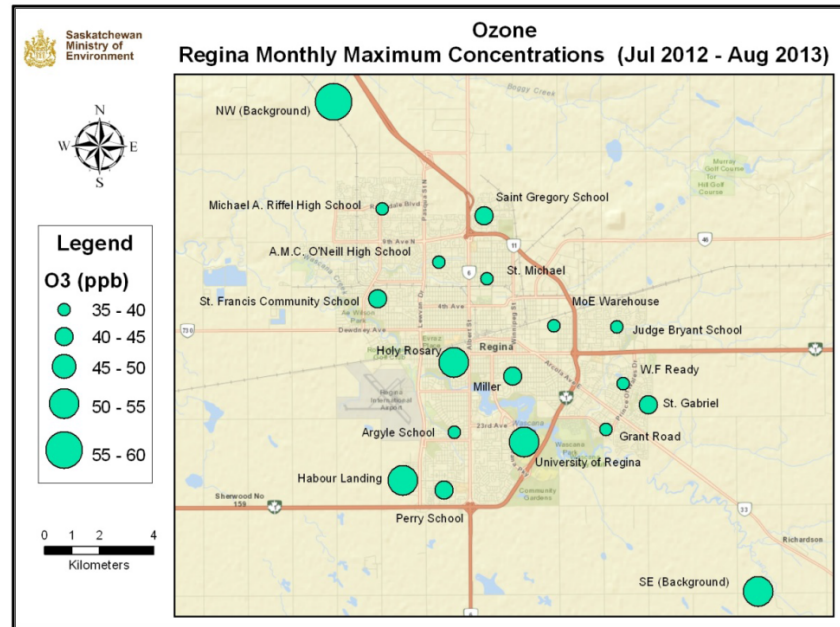




# City of Regina Air Quality Study - Results



# City of Regina Air Quality Study - Results





## Successful Airzone Management...

- Can provide industry with a better understanding of how cumulative effects impact monitoring results
- Educates public on individual lifestyle choices on air quality
- The Public should have a better understanding of general air quality in their area.

## Successful Airzone Management...

- A better understanding of cumulative impacts
- A better understanding of receptor exposure
- A better understanding of regional influences and changes to air quality over time

## Questions / Comments

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