SOUTHERN UTE INDIAN TRIBE

AMBIENT MONITORING UPDATE AND METHANE RANGER STUDY

Four Corners Air Quality Group Meeting, 2017

Presented by:
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• Air monitoring stations:
  • Ute 1 (Ignacio)
  • Ute 3 (Bondad)
  • Mobile Monitoring Station (Lake Capote)

• Criteria pollutants measured:
  • Ozone
  • Nitrogen Dioxide
  • Carbon Monoxide (Ute 1 only)
  • Sulfur Dioxide (Lake Capote only)
  • PM10 (Ute 3 only)
  • PM2.5 (Ute 3 only)

• Meteorological conditions measured:
  • Wind speed and direction
  • Relative humidity
  • Ambient temperature
  • Solar radiation
  • Precipitation
  • Visibility (Ute 3 only)
Ozone Design Values
(Fourth highest maximum averaged over a three year period):
• Design Values are calculated for each air monitoring station within a county. The highest values reported by an air monitoring station in that county is the Design Value for that county.

Design values for Ute1 are listed below:
• 2016: 68
• 2015: 68
• 2014: 67
• 2013: 69
• 2012: 69
• Ozone Design Values (Fourth highest maximum averaged over a three year period)

• Design values for Ute 3 are listed below:
  • 2016: 67
  • 2015: 66
  • 2014: 67
  • 2013: 68
  • 2012: 68
• Ambient methane is measured at two locations:
  • Ute 3 air monitoring Station
  • Lake Capote air monitoring station.
    • The lake capote station was setup May 1, 2017.

• Ambient concentrations at both stations are measured using Thermo Scientific methane and non-methane gas analyzers.

• Average Methane concentrations measured:
  • **Bondad**: 2.1ppm
  • **Lake Capote**: 1.9ppm
SOUTHERN UTE INDIAN RESERVATION REAL-TIME AQI AND WEATHER

https://www.southernute-nsn.gov/environmentalprograms/airquality/ambient/
• Study of mobile methane detection methods on the Southern Ute Indian Reservation.

• Vehicle mounted mobile methane detection system.

• Utilizes a Boreal laser and Red Hen Systems, LLC technology.

• Calculates methane concentrations, GPS location, and wind direction once every 2 seconds.
STUDY GOALS

• Evaluate the performance of mobile monitoring equipment.
  • Accuracy, reliability, practicality

• Measure ambient methane concentrations on the Reservation and assess diurnal methane concentrations and trends.

• Evaluate the effectiveness of the equipment for easily locating methane emission sources.
• Determine if a statistical correlation can be found between methane concentrations measured with mobile methane detection system and methane emissions identified with optical gas imaging (OGI) camera.
  • Is there a methane concentration that can be a reliable indicator of methane leaks?
  • Is there an “action signal” or methane concentration that warrants further investigation?

• Determine which factors (equipment type, location, facility age, etc) correlate to the presence of leaks.

• Assess the usefulness of mobile monitoring equipment for development of air programs.
Could equipment be used to develop simplified equivalency program to federally mandated methane leak detection and repair programs?

- New Source Performance Standard 0000a
- BLM Onshore Order 9

Possibility for the development of Leak Detection and Repair (LDAR) Programs?

- If no abnormal methane concentrations are discovered using mobile monitoring equipment, an OGI survey would not be needed.
- If abnormal methane concentrations were discovered, an OGI survey would be conducted.

Has the potential to reduce the time needed to complete LDAR surveys for large numbers of facilities.
METHANE RANGER STUDY CHALLENGES

• Every facility / site has a methane concentration that is considered normal.
  • Distinguishing between normal and abnormal concentrations can be difficult.

• Methane emissions can be found from many types of oil and gas equipment (pneumatics, tanks, engines, separators, etc).

• To detect some emissions with mobile equipment, some facilities must be:
  • In production, or
  • Equipment must be situated in a favorable wind direction.
CASE STUDY #1

- Methane Ranger vehicle traveled along this highway over multiple days.
- Increased methane concentrations detected.
- Wind directions suggested a methane source was located on north side of road.
CASE STUDY #1

- The Air Quality Program deployed an OGI camera to determine the source of the methane.
- A possible source was located at the bottom of a wash.
CASE STUDY #1
• The Air Quality Program contacted pipeline operators.

• Operator determined the leak was from a pipeline and promptly shut down the pipeline.

• The Air Quality Program has reinvestigated and determined the pipeline leak has been repaired.
CASE STUDY #2

- Morning survey with the Methane Ranger.
- Favorable wind direction blowing from Northwest to Southeast.
CASE STUDY #2

• Highest methane concentration found was 123.7ppm.

• OGI camera deployed

• Two sources found:
  • 1.) Venting Tank
  • 2.) Building between tank and meter house
CASE STUDY #2

- OGI video of emissions
- Contacted well pad operator
- Operator confirmed the presence of a leak
- Operator determined cause to be a bad dry seal and a open valve.
CASE STUDY #3

• Methane Ranger on an early morning survey.

• Favorable wind direction blowing from East to West
CASE STUDY #3

- Increasing ambient concentrations were noticed while approaching the well site.

- Highest methane concentration: 339ppm.

- Suspected location: Compressor Building
CASE STUDY #3

- The Air Quality Program recorded OGI camera video from a distance with a telephoto lens.

- Downwind OGI video

- OGI video confirmed emissions originating from the Compressor Building.

- Unable to determine exact source of emissions.
CASE STUDY #3

- From the upwind side of the well pad, an open door can be seen.

- The OGI camera showed a noticeable emission source.

- The Southern Ute Department of Energy contacted the well pad operator.

- Operator determined the source was from a loose compressor / engine union and was promptly repaired.
For the remainder of 2017, the study will continue to evaluate the equipment performance and effectiveness in mobile methane detection.

Over the next year, evaluating data to set an “action signal” which can be correlated with methane emissions.
  • Work with industry on air program development ideas

Following year, evaluate equivalency with LDAR requirements and network with industry.
THE SOUTHERN UTE INDIAN TRIBE AIR QUALITY PROGRAM THANKS YOU FOR YOUR TIME

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