Background: Large portion of NE Colorado has been non-attainment for ozone since 2007

Facts:
- The Colorado northeast airshed is a non-attainment area for surface ozone.
- It is home to close to 4 million people, a large cattle industry as well as a booming oil and gas industry.
- Independent studies are needed to investigate O&G HAPs emissions and assess the effectiveness of mitigation.

NE Colorado Oil and Gas Hydrocarbon Emissions
A long & iterative path towards understanding and mitigating air impacts

NOAA Mobile Laboratory at BAO

Background: Large portion of NE Colorado has been non-attainment for ozone since 2007

2004 AQCC rulemaking VOC emission reduction Early Action Compact
2006 AQCC update rulemaking Tanks, dehydrators, engines, processing plants
2007 Front Range Non-Attainment Area for Surface Ozone NAAQS
2008 AQCC update rulemaking Ozone Action Plan
2008 and 2013 COGCC rulemaking Green completion for gas wells, tanks, dehydrators, pneumatic devices
Aug 2012 empirical revision of tanks emissions: on average 40% of vapors are NOT destroyed
2014 AQCC new requirements to reduce CH4 and VOC emissions, LDAR
Tanks, fugitive/wetting, pneumatic devices
2015 EPA/State Noble Settlement re. Emissions Violation
What was learned re. emissions during the investigation? Are new data on VOCs and HAPs emissions available?
2015-2016 Ozone SIP modeling for 2017
RAQC inventory presumes major reductions in tanks VOC emissions based on industry forecast to develop tankless infrastructure

Weld County O&G Production Statistics

COGCC data

NOAA GMD Flask sampling and Analysis on MAGICC, M2 and Perseus systems
n-hexane and n-pentane are used as markers for O&G emissions while acetylene is a marker for combustion engine emissions.

Atmospheric Measurements:
- Recent data from the BAO 100 ft tall tower and aircraft flights in the area continue to show elevated hydrocarbons, markers of O&G emissions in the region.
- Air samples from tower, aircraft and ground surveys show benzene is emitted by O&G operations in the area. Pétron et al. [2014] found state O&G benzene emission estimates are underestimated by a factor of 7.