

State-wide Oil and Gas Controls

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Colorado's Air Quality

- Colorado enjoyed improvements in air quality through the 1980s and 1990s, and currently all areas of the State are in attainment with the National Ambient Air Quality Standards
- The air quality regulations and state implementation plans currently in place have provided these improvements in air quality
- When these programs were developed, it was believed that they would sufficiently protect air quality well into the future

Trends in Oil and Gas

- Exploration for natural gas is increasing in Colorado and throughout the West
- VOC and NO_x emissions from the oil and gas industry are also increasing and are relatively uncontrolled in Colorado due to their minor source status
 - Fugitive dust emissions are also on the rise
- VOCs and NO_x contribute to visibility degradation and ozone and particulate formation

Permit to Drill for Top Seven Counties

(through September 2006)

County	Jan. – Sept. 7, (% of total)	2005	2004
Garfield	1092 (29%)	1508	796
Weld	850 (23%)	901	832
Yuma	500 (13%)	782	237
Las Animas	320 (9%)	413	332
Rio Blanco	266 (7%)	161	154
Mesa	189 (5%)	136	54
La Plata	164 (4%)	117	102

Ozone and Precursor Behavior

- It is frequently stated that oil and gas emissions do not significantly contribute to high ozone levels
- The Air Division disagrees, here's why:
 - Quantity: Oil and gas is a large VOC source in Colorado and mostly uncontrolled
 - Location: Oil and gas emissions occur throughout the State and are transported locally and regionally

Ozone and Precursor Behavior (continued)

- Meteorology: High ozone readings State-wide strongly correlate to upper level high pressure systems, resulting in multi-day periods of hot weather/stagnated air
 - More opportunities for emissions to transform into ozone
- Quality: Even 'less reactive' VOCs react far more readily in areas with higher pollutant concentrations and stagnation
 - More opportunities for chemical reactions and ozone formation

Air Quality Problems are Strongly tied to Oil and Gas Activities

- Even in remote rural locations, oil and gas field resource recovery activities can lead to ozone exceedances when favorable meteorology occurs
 - Winter basin inversions, clear skies, snow cover, and mild temperatures combine to create a favorable environment for photochemistry
- The Pinedale Anticline-Jonah oil and gas well region of western Wyoming has seen a number of winter ozone exceedances that were not caused by natural events

Controlling Oil and Gas Sources

- Neighboring states are controlling emissions from minor sources
- Wyoming and Utah have minor source BACT programs, and a Colorado program has been modeled after these programs
- Controls have been modeled after these programs along with the Denver Ozone Action Plan and proposed by the Air Pollution Control Division to be applied throughout the State

Regulation Number 7 Proposals for Statewide Application

- Controls are proposed for:
 - New and existing condensate tanks
 - Condensate tanks emitting 20 tpy VOC or more and all new wells for the first 90 days will be required to control emissions by 95% commencing May 1, 2008
 - VOC: \$80/ton
 - New and relocated engines
 - Engines greater than 100 HP will be required to phase in controls for NO_x, CO and VOCs commencing May 1, 2007
 - NO_x: \$108/ton; VOC: \$240-\$1,100/ton; CO: \$193-\$385/ton
 - Glycol dehydrators
 - Dehy's emitting 15 tpy VOC or more will be required to control emissions by 90% commencing May 1, 2008
 - VOC: \$122/ton

Benefits from Controls

- For 2004, non-EAC area VOC emissions from anthropogenic sources are about 121,000 tons per year
 - Oil and gas sources emit 21% of these emissions, or approximately 25,600 tons per year
- The proposed control program is estimated to reduce non-EAC VOC emissions by approximately 6%, or approximately 6,680 tpy
 - 1,043 tpy VOC from 40 dehydrators
 - 5,637 tpy VOC from 150 condensate tanks
 - VOC reductions from well completions have not been estimated
 - NO_x, VOC and CO emissions growth from engines will be reduced – quantity not determined due to uncertainty in future compression needs in Colorado

Rationale for Controls

- Preventing Nonattainment Areas
 - For Garfield County, VOC emissions have increased by 30% from 2004 to 2006
 - The proposed regulations will begin reducing current emissions and slow emissions growth from the oil and gas industry
- Reduce Ozone and Precursor Emissions Transported into the EAC Area
 - Controls on oil and gas sources should help reduce the background concentrations of ozone and precursor emissions brought into the EAC area
- The Proposed Controls are Consistent with Controls Implemented or Under Development in Other States
 - Neighboring states are facing similar air quality issues and they have acted, or are acting, in a similar manner to bring oil and gas emissions under control

Rationale for Controls

- The Proposed Oil and Gas Control Measures will Reduce the Emissions of VOCs and NOx and Help Improve Visibility
 - VOC emissions contribute to the formation of organic carbon particulates, which degrade visibility resources
 - NOx emissions contribute to the formation of ammonium nitrate particulates, which also obscure visibility
 - Visibility resources in many Colorado Class I areas are on the decline and the State will have a very difficult time demonstrating reasonable progress with the federal visibility requirements, even without projected emissions increases from oil and gas sources
 - The proposed State-wide oil and gas controls should help the State reverse the deteriorating visibility trends and help the State demonstrate reasonable progress in the RH SIP

Rationale for Controls

- The proposed controls will reduce the emissions of air toxics and reduce odor complaints from citizens living next to or near oil and gas operations
 - The proposed controls should limit toxic emissions from dehydration units and engines
- The proposed NO_x controls for engines should also help to reduce the deposition of nitrogen in Rocky Mountain National Park and other high alpine, ecologically sensitive areas of the State
- Provides for equity across the State
 - All producers will have similar costs and requirements

Action

- The Air Quality Control Commission has scheduled a public hearing for November 16-17

Additional Measures to be Evaluated in the Future

- It is anticipated that in the coming year, additional oil and gas sources as well as many other source sectors, including power generation, will be examined for emission reduction potentials
- Though a minor source BACT program is envisioned as a State-only program, it may eventually be needed for the regional haze SIP and other programs

Oil and Gas Sources to be Evaluated for Controls

- Water tanks and ponds (VOCs)
- Leaks (VOCs)
- Heater treaters (VOCs)
- Service equipment (NO_x, VOCs, PM)
- Vehicle traffic - exhaust and unpaved roads (NO_x, VOCs, PM)
- Well pad construction (NO_x, VOCs, PM)
- Well completions (VOCs)
- Amine units (VOCs)
- Turbines (NO_x, VOCs, PM)

Oil and Gas Sources to be Evaluated for Controls

- Land development (NO_x, VOCs, PM)
- Pneumatic actuated devices w/ high pressure gas (VOCs)
- Land farming of contaminated soils (VOCs)
- Air stripping of water in evaporation ponds (VOCs)
- Drilling operations (NO_x, VOCs, PM)
- Existing engine controls (NO_x, VOCs, CO)
- Increase controls on flash emissions (VOCs)
- Re-boilers on dehydrators (VOCs)