

Updating the EAC's Ozone Action Plan

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Overview

- Condensate Tanks/Current controls
- Growth in uncontrolled flash emissions
- Ozone and Meteorology
- Proposed revisions to Regulation No. 7 and cost considerations.
- Proposed Statewide revisions to Regulation No.7

The Early Action Compact

- The EAC approach requires cleaner air faster than SIP process for a nonattainment area
- Incentives for the region
 - No nonattainment designation
 - Lesser permitting requirements
 - No transportation conformity
- EAC participants: CDPHE, CDOT, RAQC, DRCOG, Elbert, Larimer, Morgan and Weld Counties; EPA Region 8

Attainment must be achieved by EOY 2007

Current Ozone Action Plan

- Current Plan requirements
 - Lower Reid Vapor Pressure 7.8 psi gasoline; 8.8 psi ethanol blends (achieved)
 - Reduction of VOC flash emissions from condensate tanks: 37.5% in '05 ozone season; 47.5% in '06 ('05 target reached overall; reports from mid-July being reviewed)
 - Control of IC engines > 500 HP
 - Control of dehydration units w > 15tpy VOC emissions
 - Clean Screen Program limited to 50% of fleet (achieved per SIP)

Condensate VOC Flash Emissions in 8-hour Ozone Control Area

➤ Projected Emissions in Early Action Compact

Year	Uncontrolled	Controlled
2007	146.1 tpd	91.3 tpd
2012	163.0 tpd	100.9 tpd

➤ 2005 Reported Emissions*

Inventory for 2005 data year

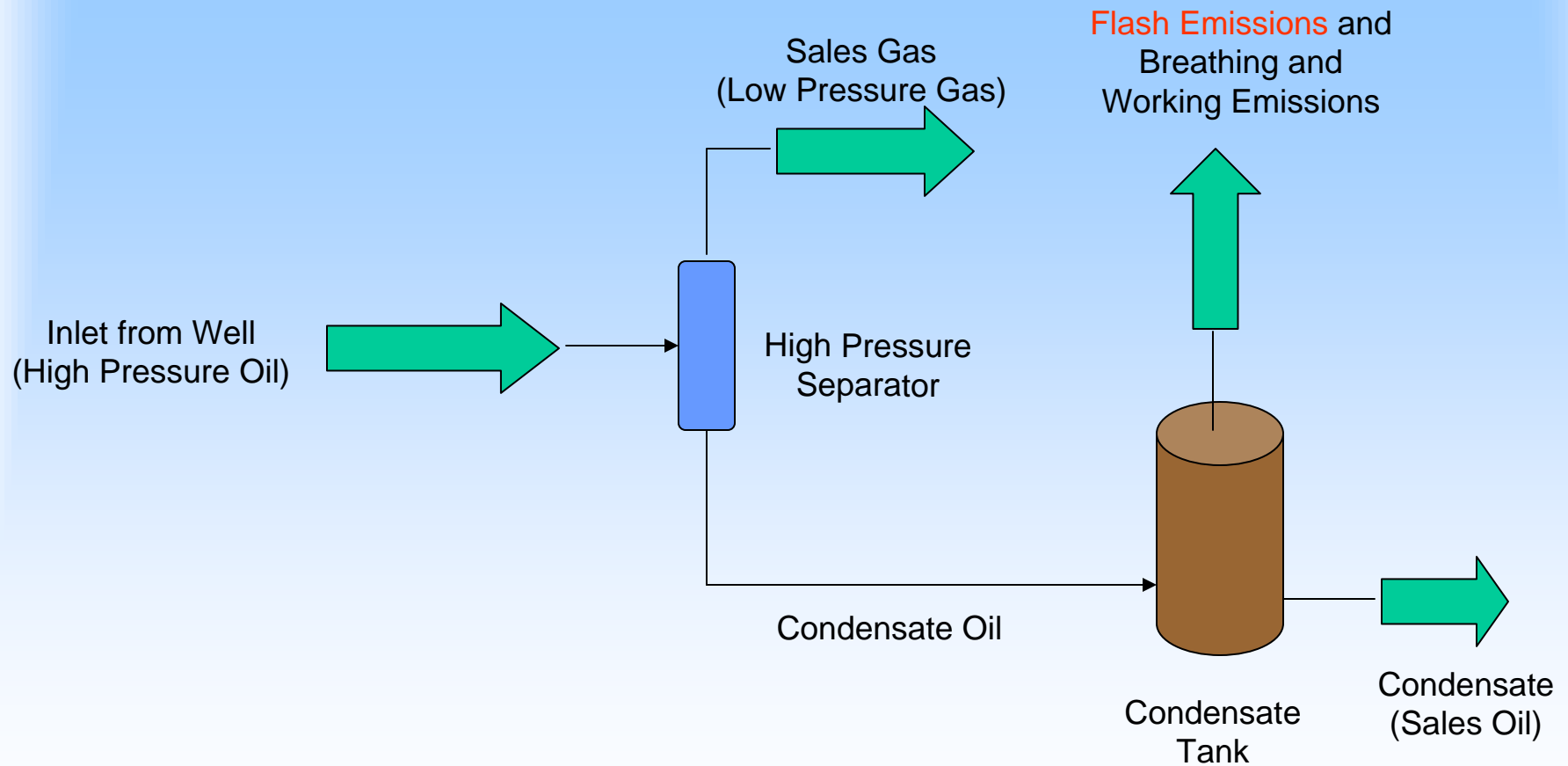
= 197 tpd uncontrolled

= 120 tpd controlled

*Exceeds 2007
projections*

* Emissions data from 2005 source spreadsheets

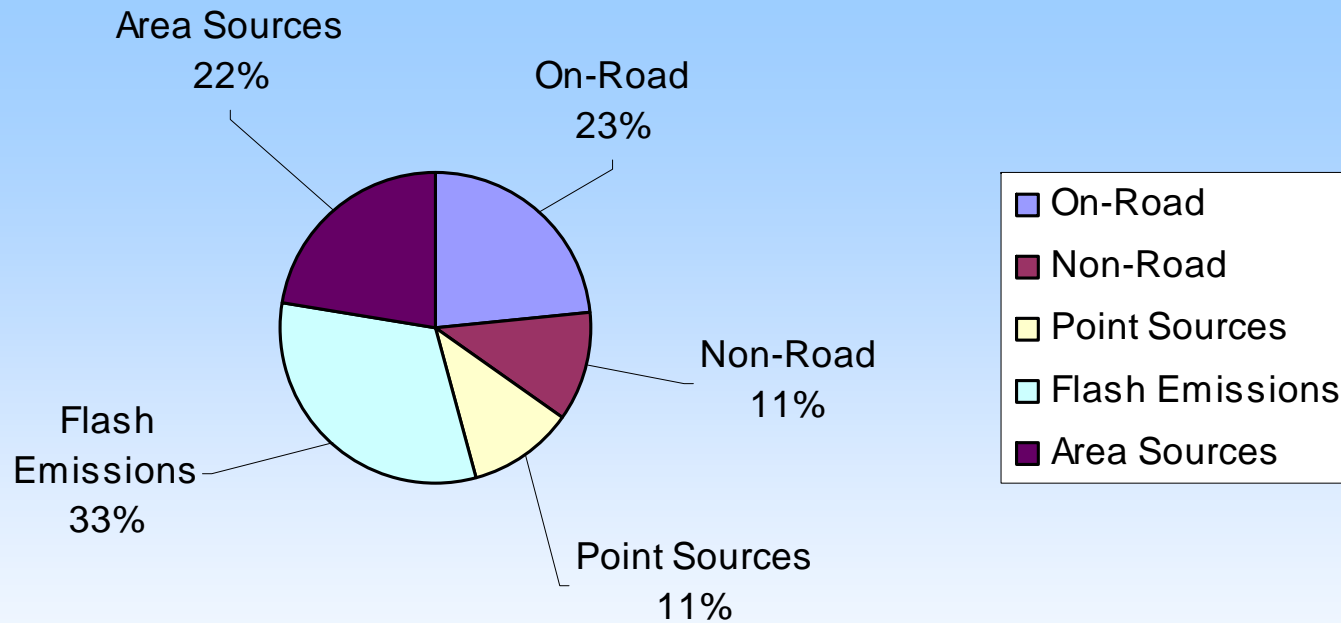
Oil/Gas Production Tank System



Projected Condensate Tank Flash Emissions

- For 2007, uncontrolled flash emissions will likely exceed 236 tons/day
- More stringent VOC emission controls are necessary to preserve the 91 tons/day controlled emissions level
- Oil & Gas largest, fastest growing source category of VOC

EAC Area Anthropogenic VOC Emission Allocations (2007)



Nonattainment Implications

- If we don't bring 2007 condensate tank emissions to 91 tons per day, the EAC will likely be terminated and the area designated as nonattainment.

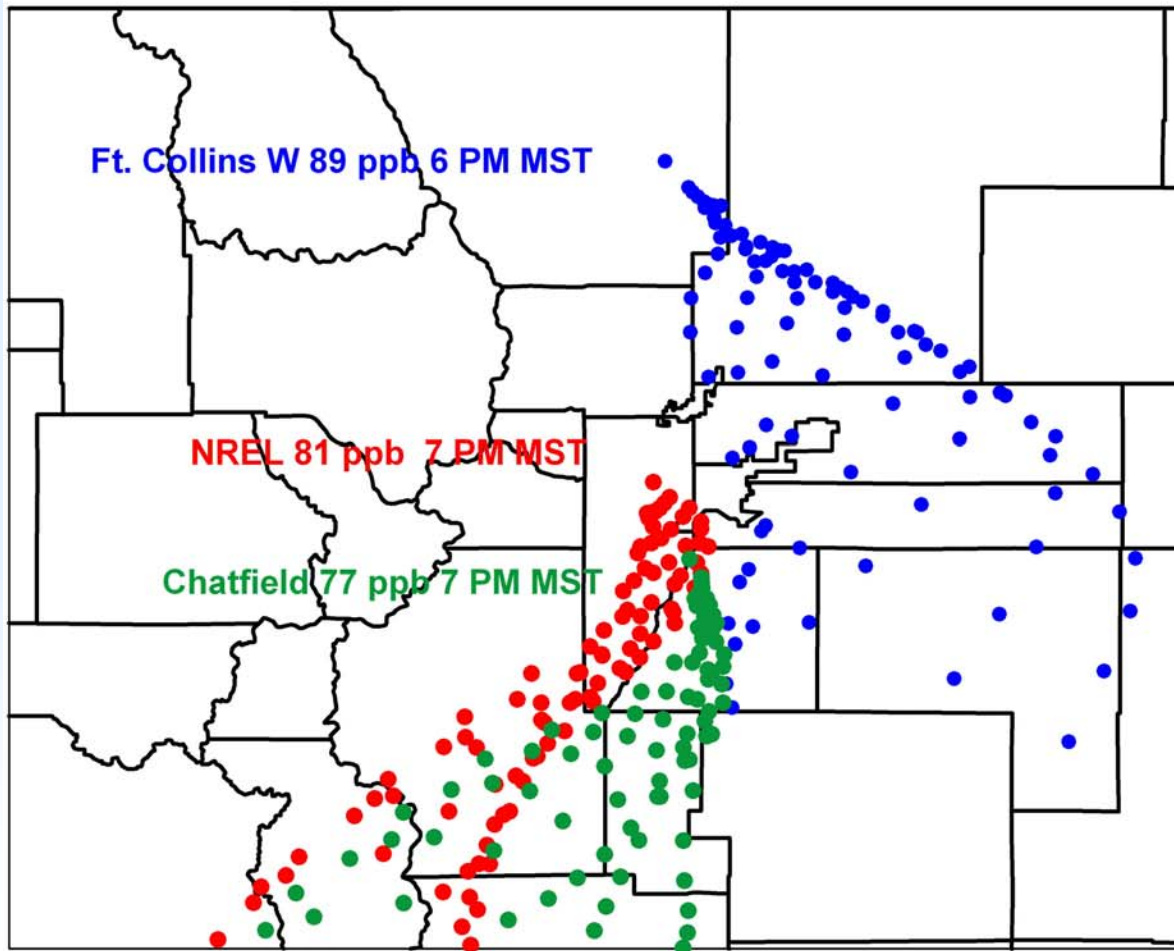
Nonattainment Implications

- Stringent permitting requirements
 - 100 tpy thresholds (VOC and NOx) and major modifications would require LAER and to offset emission increases
- Transportation conformity demonstrations
 - From Douglas County to Fort Collins and Greeley
 - Two different MPO's and LPA's
- Additional mandatory controls
 - Gasoline – RVP limits applied to Weld and Larimer
 - Expand VOC controls to all of EAC area

Ozone and Precursor Behavior

- High ozone readings on the Front Range strongly correlate to upper level high pressure systems over the Four Corners region.
- Multi-day periods of hot weather/stagnated air foster ozone formation
- Transported ozone levels to EAC area background (40 to 60 ppb)
- The 'less reactive' VOC react far more readily in areas with higher concentrations because of more opportunities for chemical reactions; reactions in < a day rather than weeks.

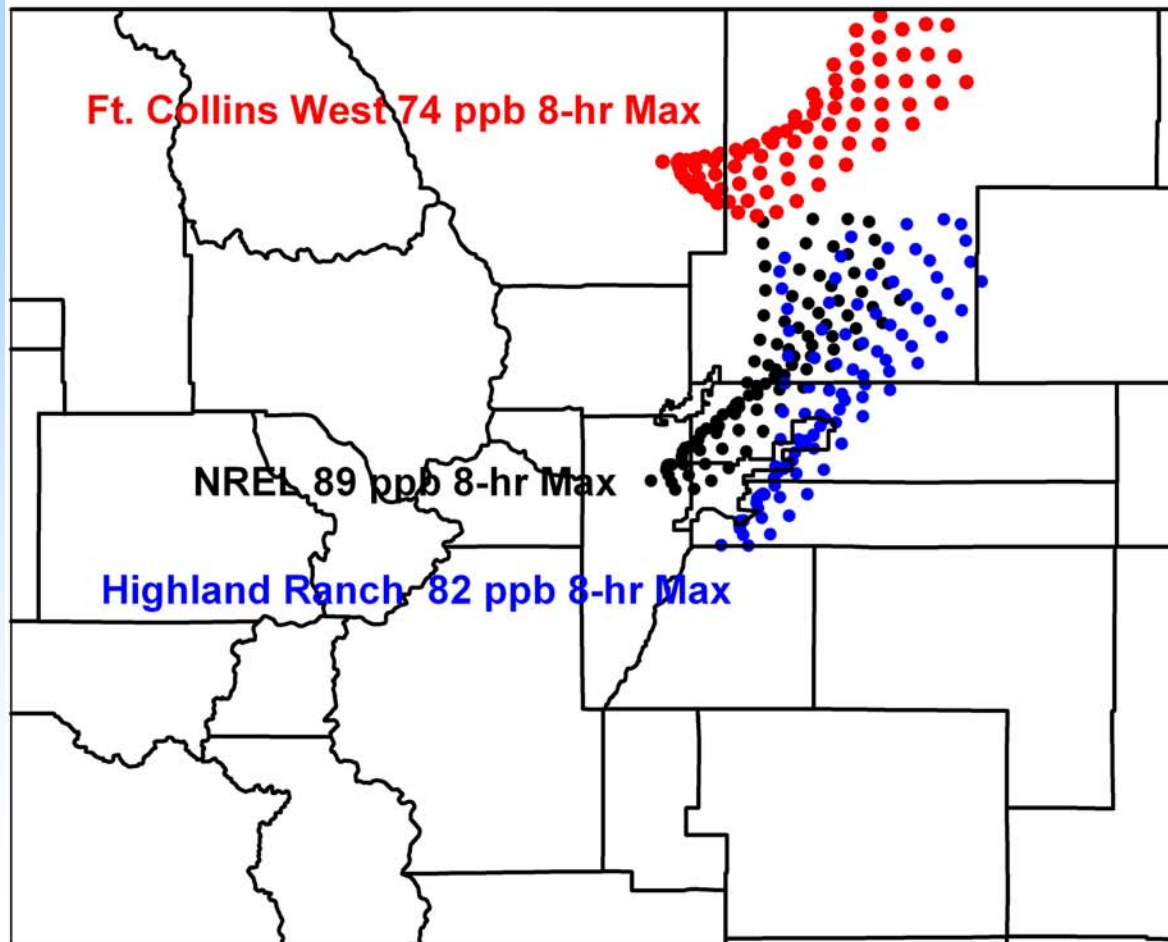
Back Trajectories For High Concentration Sites Often Travel Through Many Different Source Regions



June 13, 2006, Max network value of 89 ppb at Fort Collins West

Back Trajectories based on NOAA ARL HYSPLIT model and high resolution meteorological data.

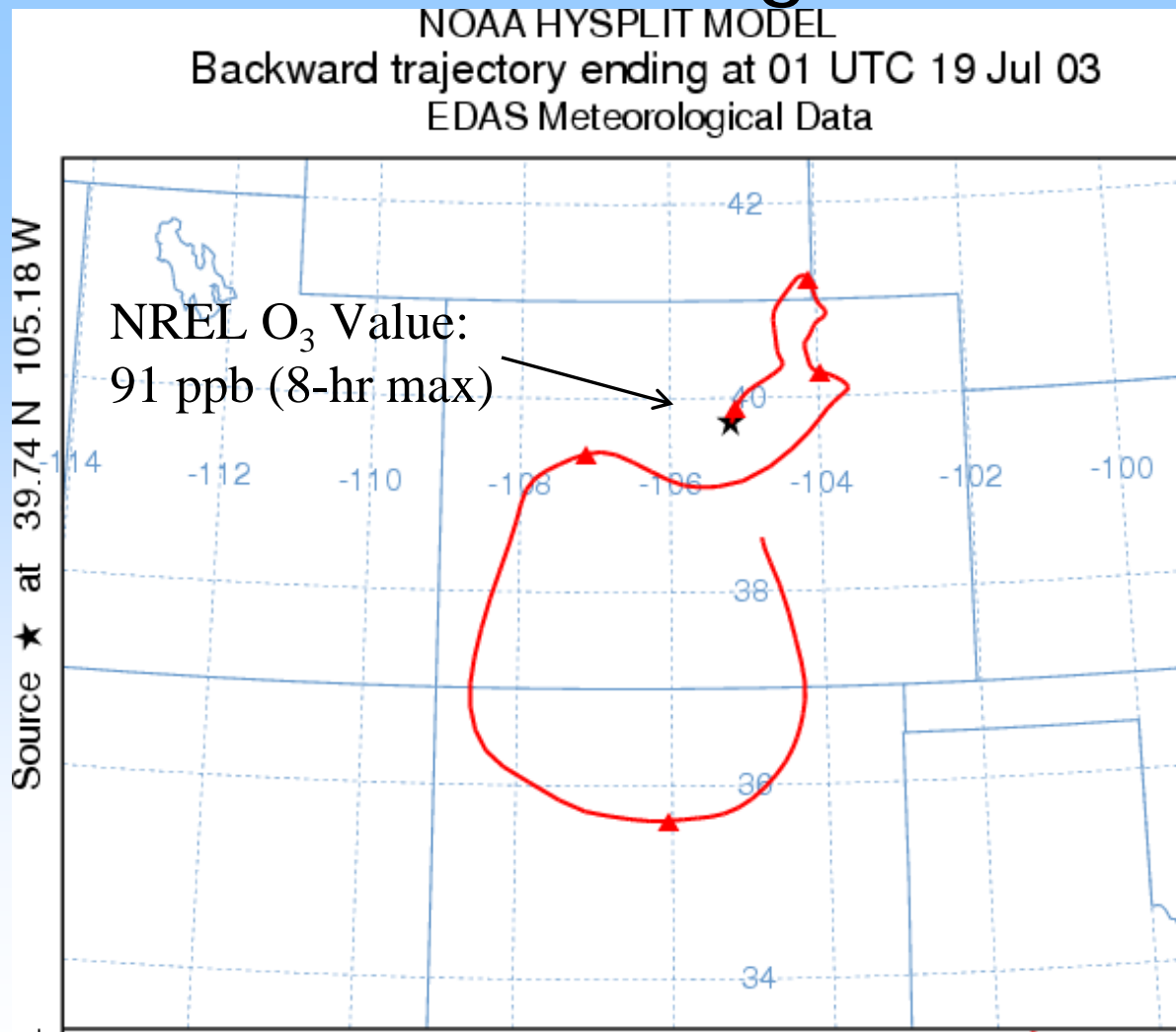
Back Trajectories For High Concentration Sites Often Travel Through Many Different Source Regions



July 22, 2006, Max network value of 89 ppb at NREL

Back Trajectories based on NOAA ARL HYSPLIT model and high resolution meteorological data.

Multi-Day Back Trajectory Shows Movement Throughout State



In August APCD Proposed Revisions to Regulation Number 7

- For EAC Area Flash Emissions:
 - Further reduce VOC emissions:
 - Condensate tanks emitting 11 tpy VOC or more will be required to control emissions to 95% commencing May 1, 2007
 - Condensate tanks emitting 6 tpy VOC or more will be required to control emissions to 95% commencing May 1, 2012
 - Condensate tanks serving wells newly drilled, re-completed or stimulated wells after 4/30/07 must be controlled to 95% during first 90 days of production.

Costs per ton VOC reduction in EAC area (flares)

- For 2007:
 - 1300 additional tanks @ \$10,600 each
 - Additional 54.8 tons VOC per day reduction
 - \$194 per ton VOC reduction

Regulation Number 7 Proposals for Statewide application Outside EAC Area

- Tanks that emit ≥ 20 tpy VOC must be controlled to 95% efficiency, beginning May 1, 2008
- Tanks serving wells drilled, stimulated or re-completed after April 30 '08 must control VOC to 95% efficiency level during first 90 days of production

Regulation Number 7 Proposals for Statewide application (incl EAC area)

- Statewide: Glycol dehydration units emitting ≥ 15 tpy VOC must reduce emissions 90%
- New and relocated natural gas-fired RICE must meet latest emission standards for NO_x, CO, NMHC.

Costs per ton VOC reduction

- Condensate tanks outside EAC area statewide: 152 eligible tanks; additional 16.26 tpd VOC reduced at \$80 per ton (flares); \$263 per ton (VRU)
- Glycol natural gas dehydrators statewide: 38 eligible units using flares; additional 2.86 tpd reduced at \$122 per ton
- Engines statewide: 850-1200 eligible engines
Rich-burn: \$108/ton NO_x; \$193/ton CO;
\$1105/ton THC reduced
Lean-burn: No NO_x controls needed; \$385/ton CO; \$239/ton THC reduced

Benefits of Statewide Regulations

- Assist the EAC area by reducing ozone and precursor transported to the area
- As ozone levels are on the rise statewide, proposed regulations would slow/prevent some degradation.