

2006 Baseline Emission Inventory for the Denver-Julesburg Basin (WRAP Phase III)



Topics Covered

- Background for WRAP Phase III Study
- Inventory Development
- Inventory Results
- Data Sources
- Use of Data for Ozone SIP Process
- Closing Remarks

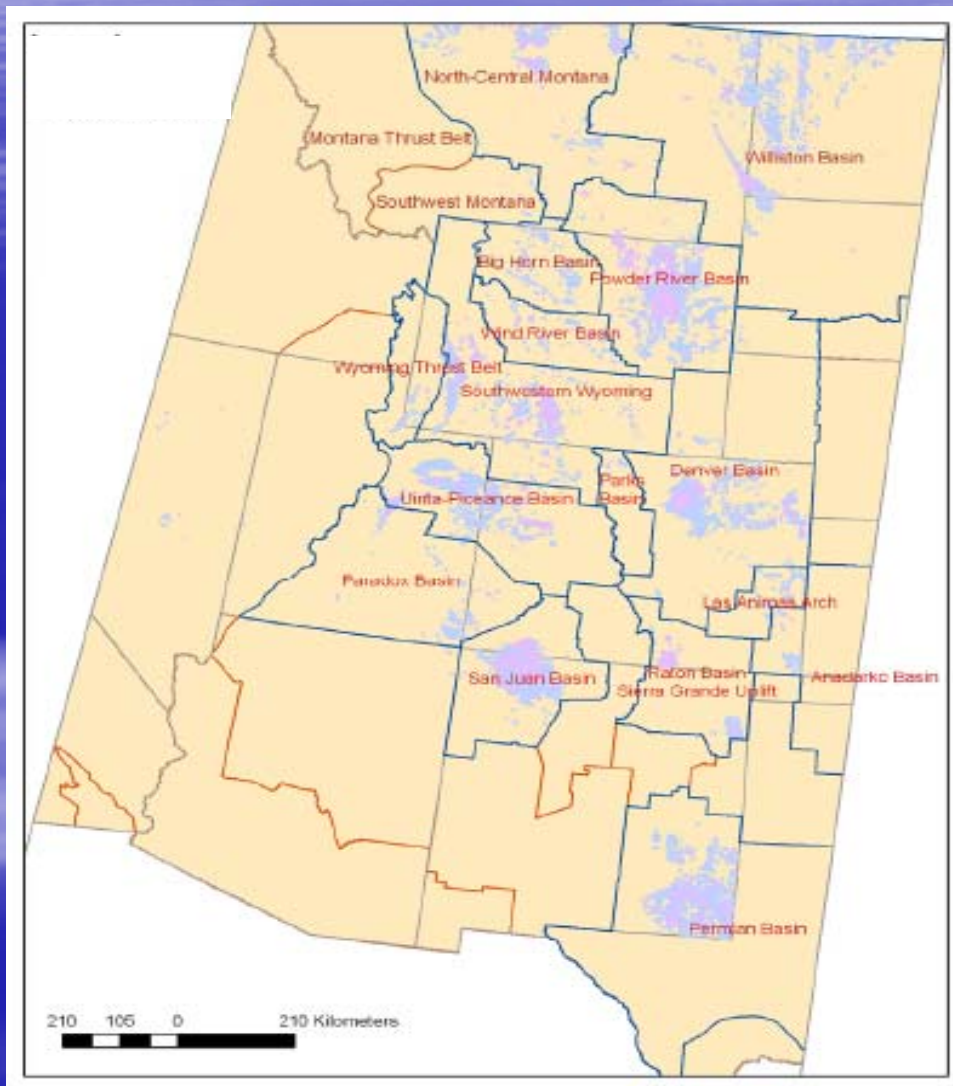
WRAP Phase III Inventory

- Comprehensive inventory of sources from oil and gas exploration and production activities
- Builds on Phase I and Phase II
- Identifies and characterizes differences between regional basins
- Refines future growth projections
- Provides a mechanism for future updates

Emission Inventory Sources in Phase III Study

- All basins will have complete source inventories for base year (2006) and three future years – for all exploration and production activities:
 - NO_x
 - SO_x
 - PM
 - VOC
 - CO

Basins in Phase III Study



- Denver-Julesburg
- Uinta
- San Juan
- Piceance
- Green River
- Powder River
- Paradox
- Williston
- Wind River
- Big Horn
- Great Plains

Phase III Study Deliverables

- Inventory data for basin-, tribal- and county-level criteria emissions for 2006 and future projection years
- Complete regional criteria emissions for the oil and gas sector
- Annual update reporting tool

Phase III Study Schedule

December 2007	<ul style="list-style-type: none">•Project start: analyze Colorado point-source data for D-J Basin; draft surveys
January 2008	<ul style="list-style-type: none">•Collect and process D-J Basin surveys; calculate draft baseline emissions•Prepare and distribute Uinta Basin surveys•Uinta Basin Air Quality modeling-study meeting, Denver 1/24/08
February	<ul style="list-style-type: none">•Develop future-year projection methodology•Finalize D-J Basin baseline inventory, files to Colorado DPHE for northern Colorado ozone base year modeling•Collect and process Uinta surveys
March	<ul style="list-style-type: none">•Calculate D-J Basin future-year emissions; provide files for northern Colorado ozone future-year modeling•WRAP conference call to review D-J baseline and future-year emissions inventories with interested parties•Complete baseline Uinta Basin emissions, and provide files for Uinta Basin AQ modeling study

Phase III Study Schedule (cont.)

April through June	<ul style="list-style-type: none">• Prepare and distribute surveys for remaining basins
July through December	<ul style="list-style-type: none">• Collect and process surveys for remaining basins• Develop baseline and future-year projections for remaining basins• WRAP conference calls for each basin to review baseline and future-year emissions inventories• Develop annual reporting tool for participating companies
January 2009	<ul style="list-style-type: none">• All inventories complete for Phase III basins• Draft project report
February	<ul style="list-style-type: none">• Final project report• Phase III emissions files for future modeling

Phase III Study Review Process

- WRAP oil and gas workgroup will study base and future-year emission-inventory results for each basin and review final technical memo
- Workgroup participants: states, tribes, federal land managers, industry, environmental groups
- WRAP staff will summarize comments from each basin workgroup session
- Phase I – III work products at:
<http://www.wrapair.org/forums/ssjf/documents/eictts/oilgas.html>

D-J Basin Inventory Development

- 2006 Regulation 7 reports provided by CDPHE
- APEN data provided by CDPHE: refined
- Industry surveys: unprecedented level of industry participation
- Incorporates data from COGCC and *IHS Enerdeq* Database
 - Well spuds and completions
 - Water, gas, condensate production

Phase III Methodology Development

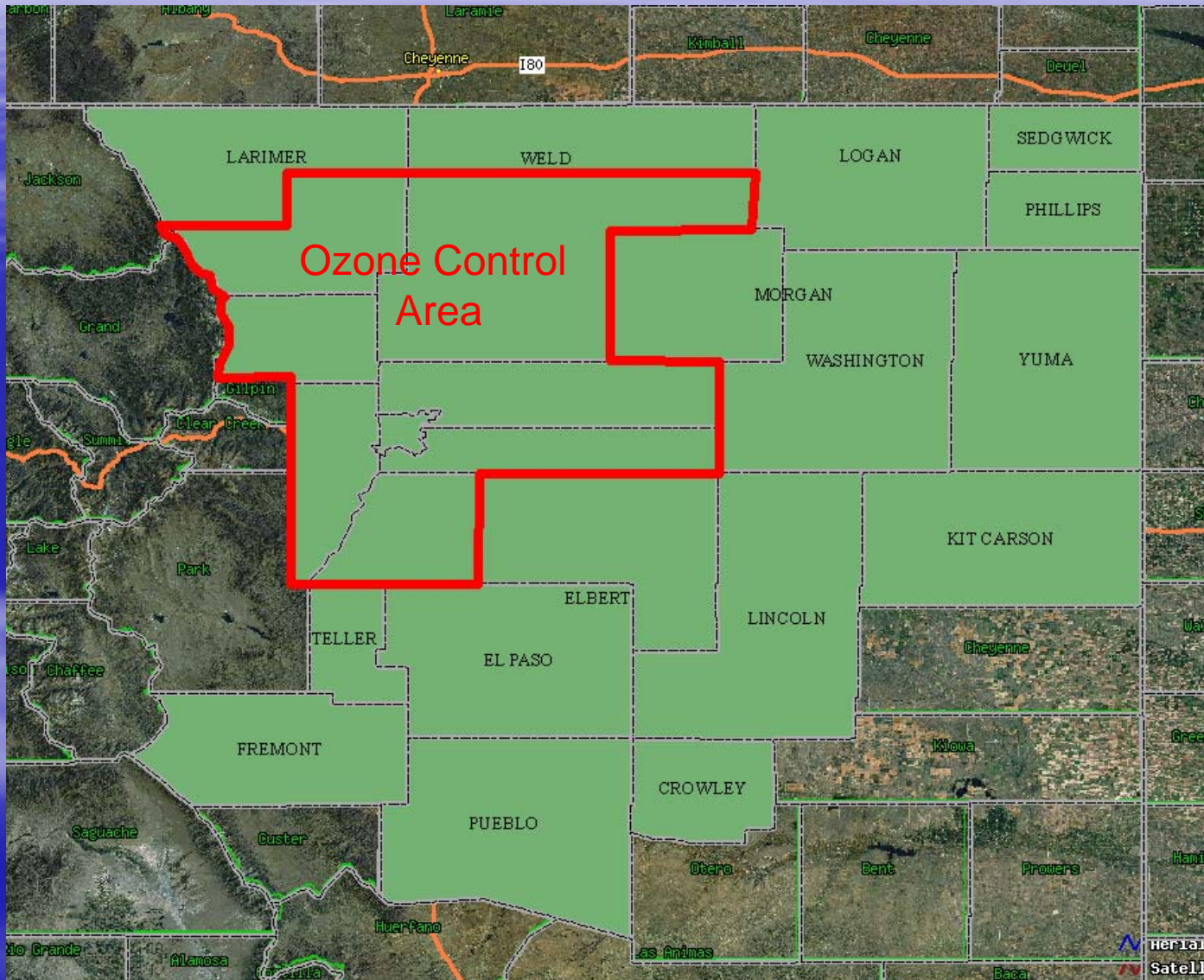
- Approval of project methodology and schedule in consultation with CDPHE
- CDPHE expanded the source categories
- Producer survey results key to area source emissions estimates
- Updated APEN point-source data
- Continuing to refine methodology and inventory results for future updates

Sources surveyed for D-J Basin in Phase III

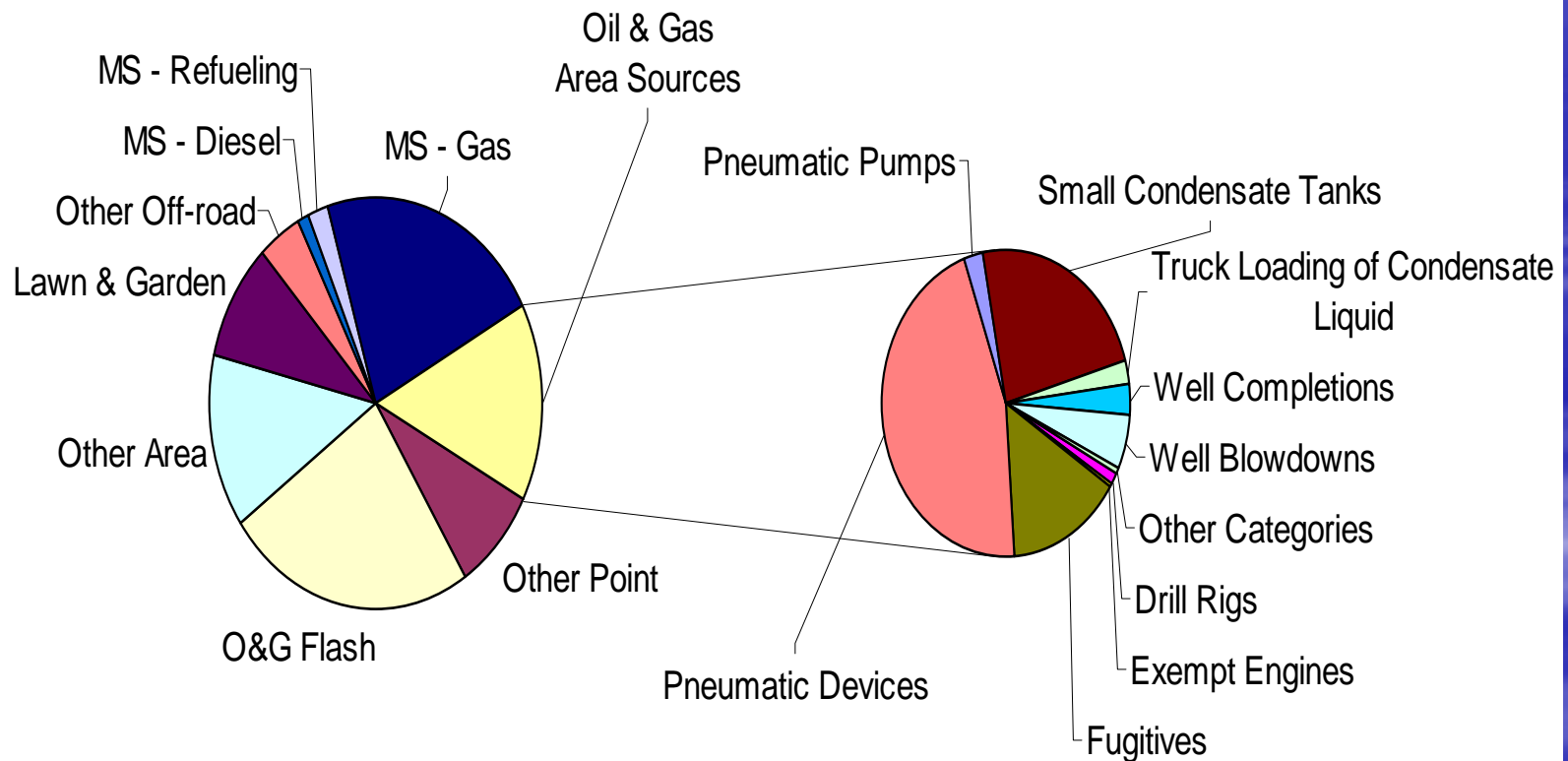
- Natural gas processing plants
- Compressor stations
- Drilling/Workover rigs
- Salt-water disposal engines
- Artificial lift engines
- Vapor recovery unit (VRU) engines*
- Oil/Gas well heaters
- Hydrocarbon storage tanks
- Oil/Gas well completions
- Fugitive emissions
- Venting
- Blowdowns
- Dehydration units
- Amine units
- Hydrocarbon loading
- Landfarms*
- Water treatment/Injection
- Flaring
- Pneumatic devices
- Produced water tanks*
- APEN exempt condensate tanks*
- APEN exempt engines*

**CDPHE expansion of source categories*

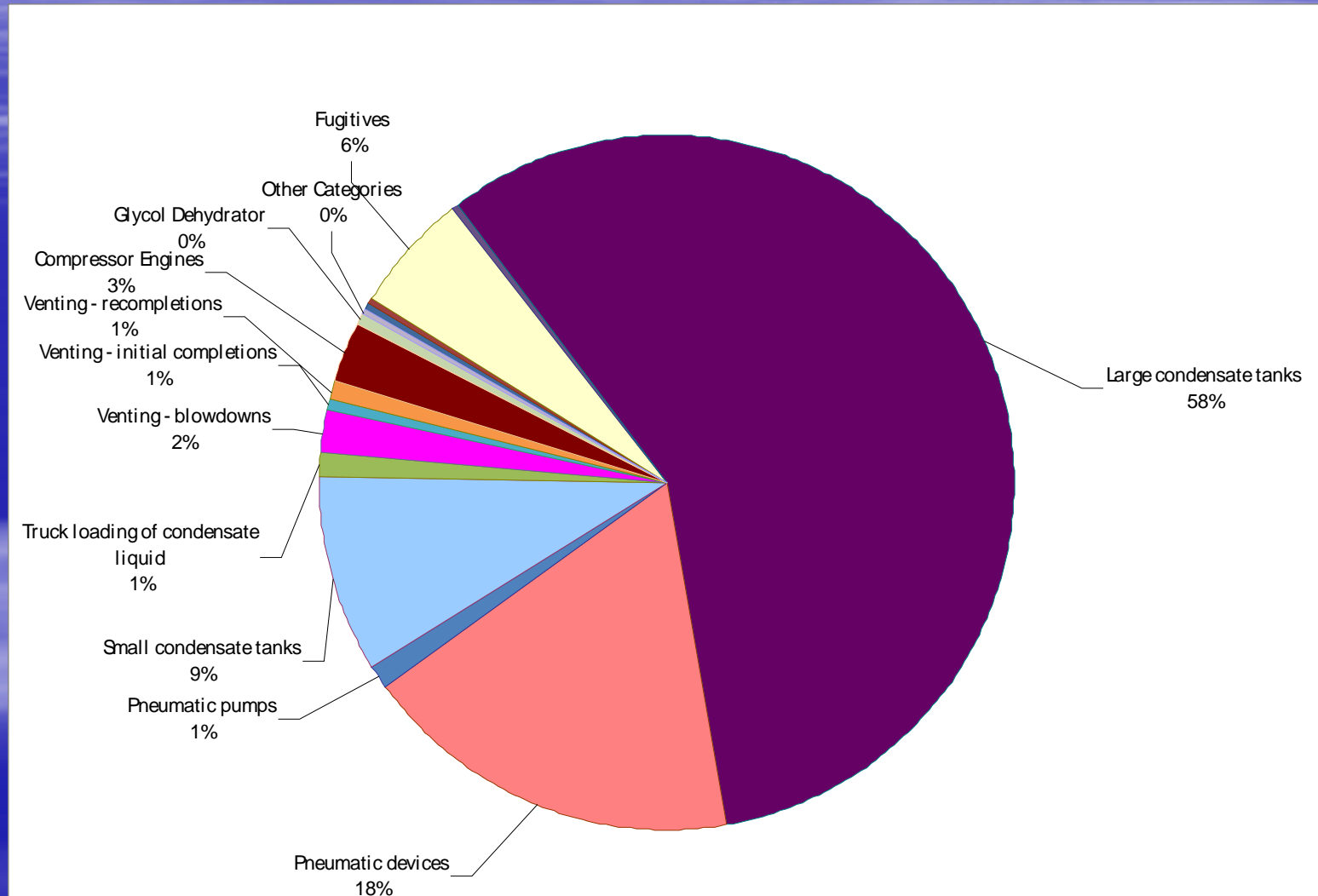
WRAP Phase III Area



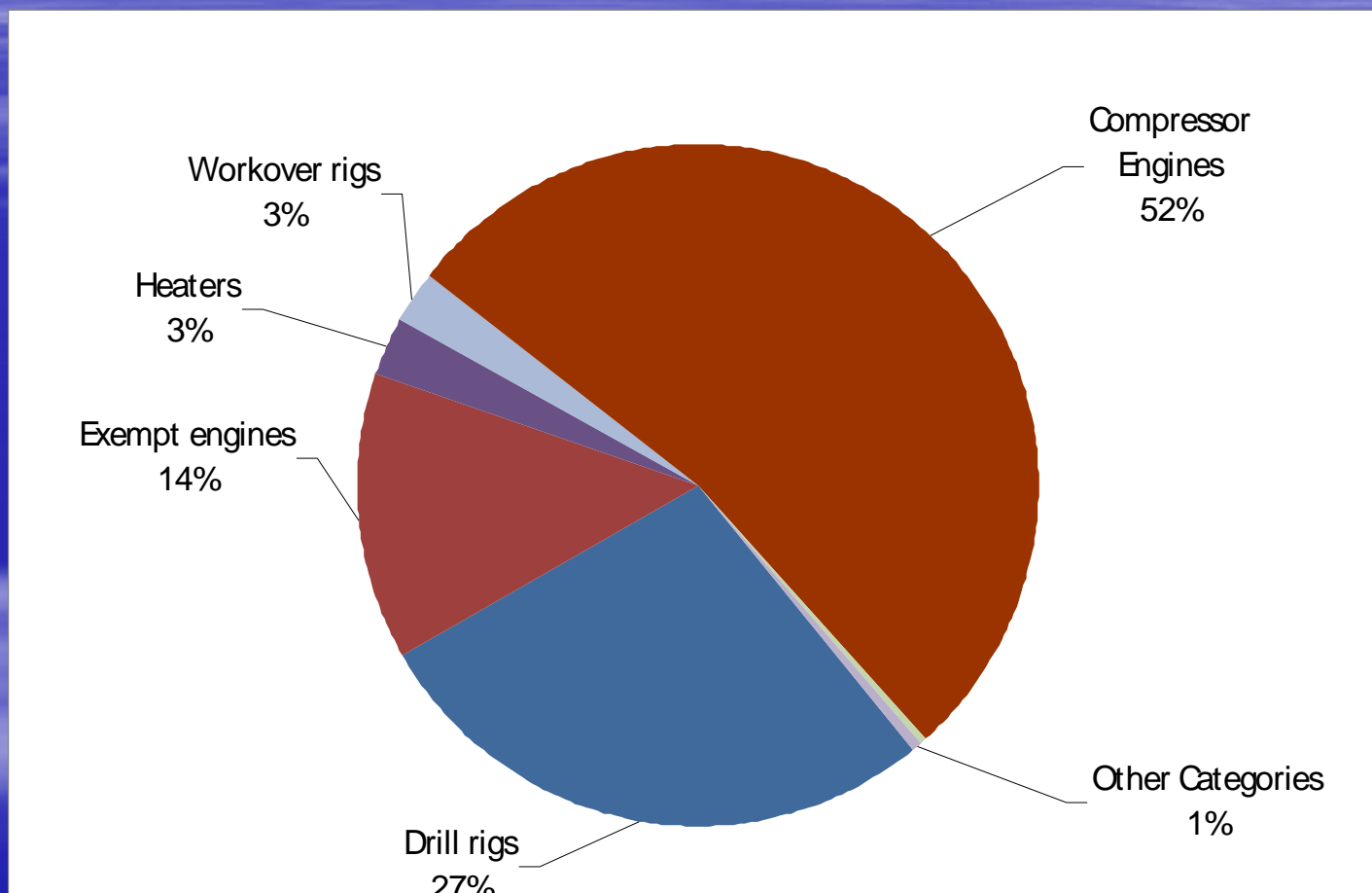
Ozone Control Area VOC Emissions



Preliminary Phase III Oil & Gas 2006 VOC Summary: Ozone Non-attainment Area



Preliminary Phase III Oil & Gas 2006 D-J Basin NO_x Inventory



Data Sources

- Emissions based on 2006 compliance reports submitted to CDPHE
- Refined APEN database information
- Production data provided by industry was verified by COGCC and IHS databases (databases agree within 1%)

Use of Phase III Data in the Ozone SIP Development

- Point-source data is a significant improvement over existing APEN database
 - Duplicates identified
 - Retired sources identified
- Complete oil and gas area source inventory
 - More accurate than the 50 tpd value used in previous analyses

Ongoing Emission Reductions

- 2006 revisions to Regulation 7
 - Delivered 35% - 40% reduction in flash VOC
- Voluntary pneumatic retrofits
 - Several operators have committed
 - Environmental benefit seen in 2008

Ozone Control Strategy Development

- The proposed ozone SIP should be specific to the existing (or perhaps expanded) non-attainment area around Denver – not the entire state of Colorado.
- Sound scientific evidence, based on the photochemical modeling process, should be evaluated before mandatory control strategies are proposed.
- The selection of mandatory controls should be consistent with the results of the modeling effort.

Concluding Remarks

- Phase III is best available source of emissions information for all source categories.
- Support the RAQC modeling process and a science-based approach to identifying effective ozone strategies.