



# **2002 Baseline Oil and Gas Inventory**

Overview of Methods and  
Summary of Results

September 7, 2005

# Oil & Gas Sources

## ⇒ Area Sources covered

- Oil/Gas well drilling (NO<sub>x</sub>) – drill rig prime movers
- Natural gas compressor engines (NO<sub>x</sub>)
- Wellhead activities – (NO<sub>x</sub>, VOC) dehydration, heaters, tanks, etc...
- Coal bed methane generators

## ⇒ Stationary Sources

- Compressor stations
- Gas plants
- Other smaller sources depending upon State inventory thresholds

# Summary of Methods – 2002 Emissions

Source	Method
Drilling	<p>Activity Data: Drilling permits – number of wells drilled, duration and depth of wells</p> <p>Emission Factor: Derived from WYDEQ survey of drilling operations in the Jonah-Pinedale area</p>
Compression	<p>Activity Data: Gas production</p> <p>Emission Factor: Derived from an emission inventory conducted by the New Mexico Oil and Gas Association</p>
CBM Pump Engines	<p>Activity Data: Water production at CBM wells and well characteristics used to estimate engine activity</p> <p>Emission Factor: NONROAD factor for gas fired engines</p>
Minor NOx and VOC Wellhead Processes	<p>Activity Data: Well production data</p> <p>Emission Factors: Default was to use factors provided by WYDEQ, but States and stakeholders were encouraged to provide local factors</p>

# 2002 Inventory – Activities since last SSJF presentation

- ⇒ CBM pump engine methodology revised
- ⇒ Tribal inventory completed
- ⇒ State and tribal inventories reconciled
- ⇒ Draft documentation completed for State and Tribal base year inventories
  - <http://www.wrapair.org/forums/ssjf/documents/eictts/oilgas.html>
  - Report on 2002 and 2018 inventories available w/e October 4

# Revised CBM Generator Methodology

- ⇒ Previous method
  - Derived emission factor from WYDEQ generator data
  - Combined emission factor with water production
- ⇒ Developed new method using engineering calculations to estimate emissions based on water production and well characteristics

Area	NOx (tons)	
	Previous Estimate	Revised Estimate
Tribes	NA	9
Colorado	202	1,489
New Mexico	36	225
Wyoming	814	1,428

# Tribal Emission Inventories

- ⇒ Major point sources provided by ITEP
  - EPA
  - Navajo Nation
- ⇒ Area sources
  - Same set of sources as for States
  - Same methods but with modifications to address data availability

# Differences between Tribal and State Inventory Methods

Arapahoe and Shoshone	Tribe did not provide production records for individual wells. State data used with refinements provided by Tribe.
	Medium-sized points not included in point source inventory. Estimated as an area source using operator-provided emissions data and data from previous inventory.
Navajo Nation	Tribe did not provide production records for individual wells. State data used after review by Tribe.
	Medium-sized points not included in point source inventory. Estimated as an area source based on gas production.
Ute Mountain Ute	Tribe did not provide production records for individual wells. State data used with refinements provided by Tribe.
	Well operators provided compressor engine emissions estimates.

# Summary of Changes to 2002 Oil and Gas NOx Emissions

<b>States and Tribes</b>	<b>Drill Rigs</b>	<b>Compressor Engines</b>	<b>CBM Pump Engines</b>	<b>Minor NOx Wellhead Processes</b>
Arapahoe and Shoshone	188	754	-	227
Ute Mountain Ute	2	478	-	59
Navajo Nation	8	667	9	482
Colorado			1,489	
New Mexico			225	
Wyoming			1,428	

# 2002 Reconciled Oil and Gas NOx Emissions

States and Tribes	Drill Rigs	Compressor Engines	CBM Pump Engines	Minor NOx Wellhead Processes	Total
Arapahoe and Shoshone	188	754	-	227	1,169
Ute Mountain Ute	2	478	-	59	540
Navajo Nation	8	667	9	482	1,167
Alaska <sup>1</sup>	877	-	-	9	886
Arizona <sup>2</sup>	-	-	-	-	-
Colorado <sup>3</sup>	5,734	-	1,489	15,924	23,147
Montana	1,044	2,027	-	4,721	7,792
Nevada	24	33	-	5	62
New Mexico	6,645	40,095	225	13,482	60,446
North Dakota	1,536	2,920	-	176	4,631
Oregon	-	73	-	12	85
South Dakota	36	284	-	47	367
Utah	676	2,371	-	2,143	5,190
Wyoming	4,964	7,025	1,428	6,283	19,699
<b>Total</b>	<b>21,735</b>	<b>56,728</b>	<b>3,150</b>	<b>43,568</b>	<b>125,181</b>

<sup>1</sup> In Alaska, emissions from most processes are carried under point sources due to the manner of permitting.

<sup>2</sup> All oil and gas activity in the State of Arizona occurs on tribal lands

<sup>3</sup> In Colorado, compressor engine emissions are entirely included in the point source inventory