

Phase III – Overview of Inventory Effort

- Inventory is conducted on a basin-by-basin level
- Phase III will cover most major oil and gas production basins in the Intermountain West
- Inventories are intended to include most major oil and gas sources including area sources and point sources – but does not include mobile sources (with the exception of drilling rigs)
- Temporal scope considers a 2006 baseline year, 2012 midterm projections, and 2018 far future year projections
- Only criteria pollutants are covered: NO_x, VOC, CO, SO_x, PM

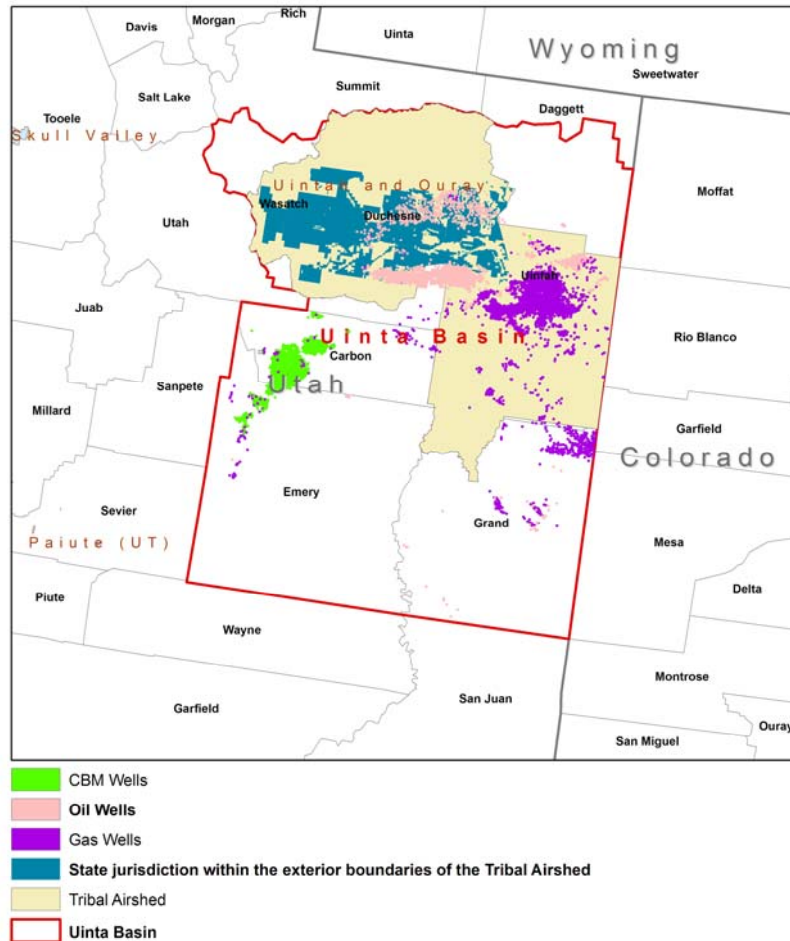


The sources considered in this analysis include the following:

- Lateral/wellhead compressor engines
- Drilling rigs
- Workover rigs/frac rigs
- CBM pump engines
- Salt-water disposal engines
- Artificial lift engines (pumpjacks)
- Vapor recovery unit (VRU) compressor engines
- Miscellaneous gas-fired engines
- Oil well heaters
- Gas well heaters
- Miscellaneous gas-fired heaters or boilers
- Flaring
- Oil well tanks – breathing losses, gas venting, flashing emissions
- Gas well tanks – breathing losses, gas venting, flashing emissions
- Pneumatic devices
- Oil well fugitive emissions
- Gas well fugitive emissions
- Gas well completions
- Venting
- Blowdowns
- Dehydrators
- Amine units
- Gas well truck loading
- Oil well truck loading
- Pipeline/compressor station fugitive emissions
- Landfarms
- Water treatment/water injection facilities

Uinta Basin – Geographic Scope

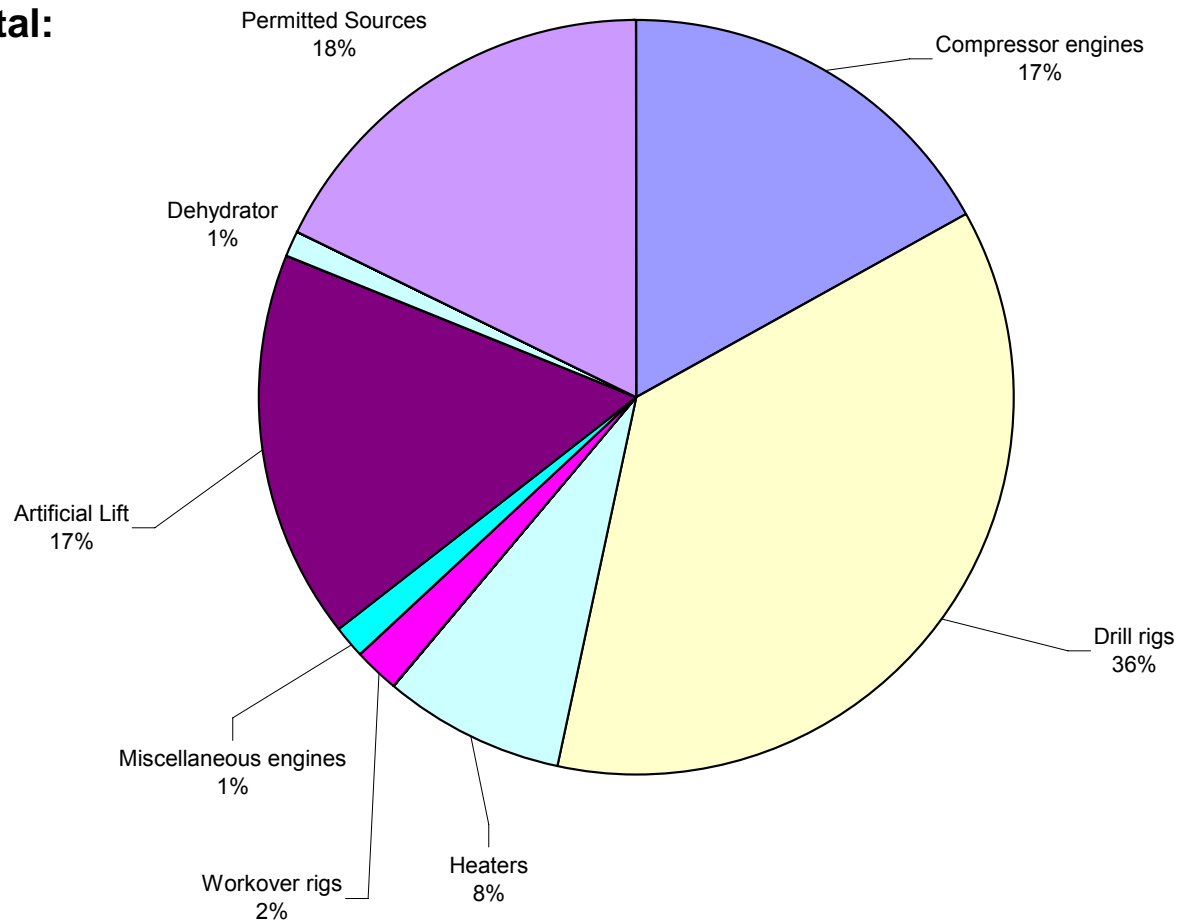
Uinta Basin - 2006 Well Location



- Includes the following counties in Northeastern Utah:
 - Carbon
 - Duchesne
 - Emery
 - Grand
 - Uintah
 - Wasatch
- County-level emissions generated for all counties within the basin
- Basin boundaries re-defined to align with county boundaries to simplify county-level reporting

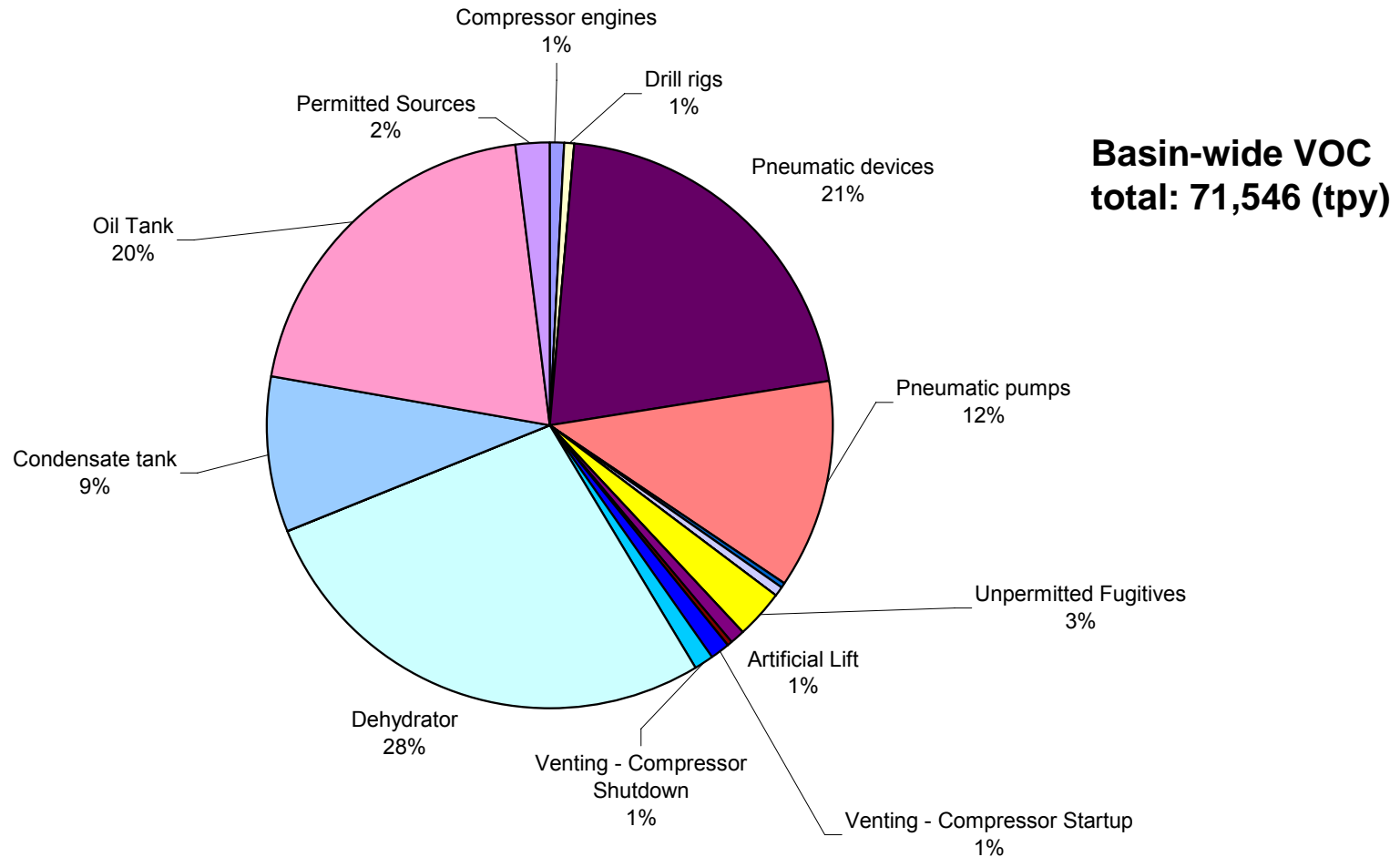
Uinta 2006 Baseline Results NOx Emissions By Source Category

**Basin-wide NOx total:
13,093 (tpy)**



- NOx emissions dominated by drilling rigs, permitted and unpermitted compressors and artificial lift engines

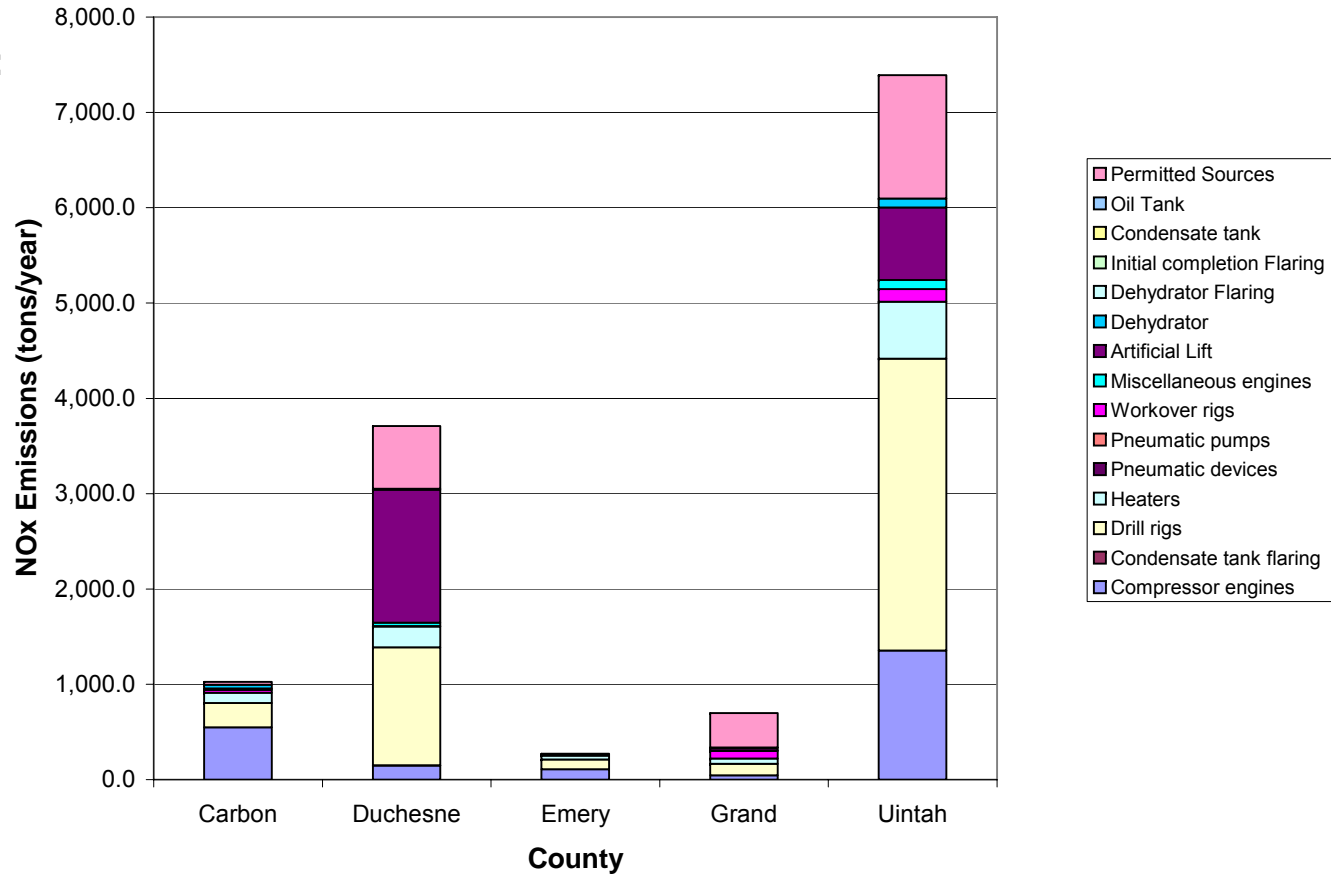
Uinta Basin 2006 Baseline Results VOC Emissions By Source Category



- Top VOC source categories include dehydrators, pneumatics and oil/condensate tanks

Uinta Basin 2006 Baseline Results NOx Emissions By County

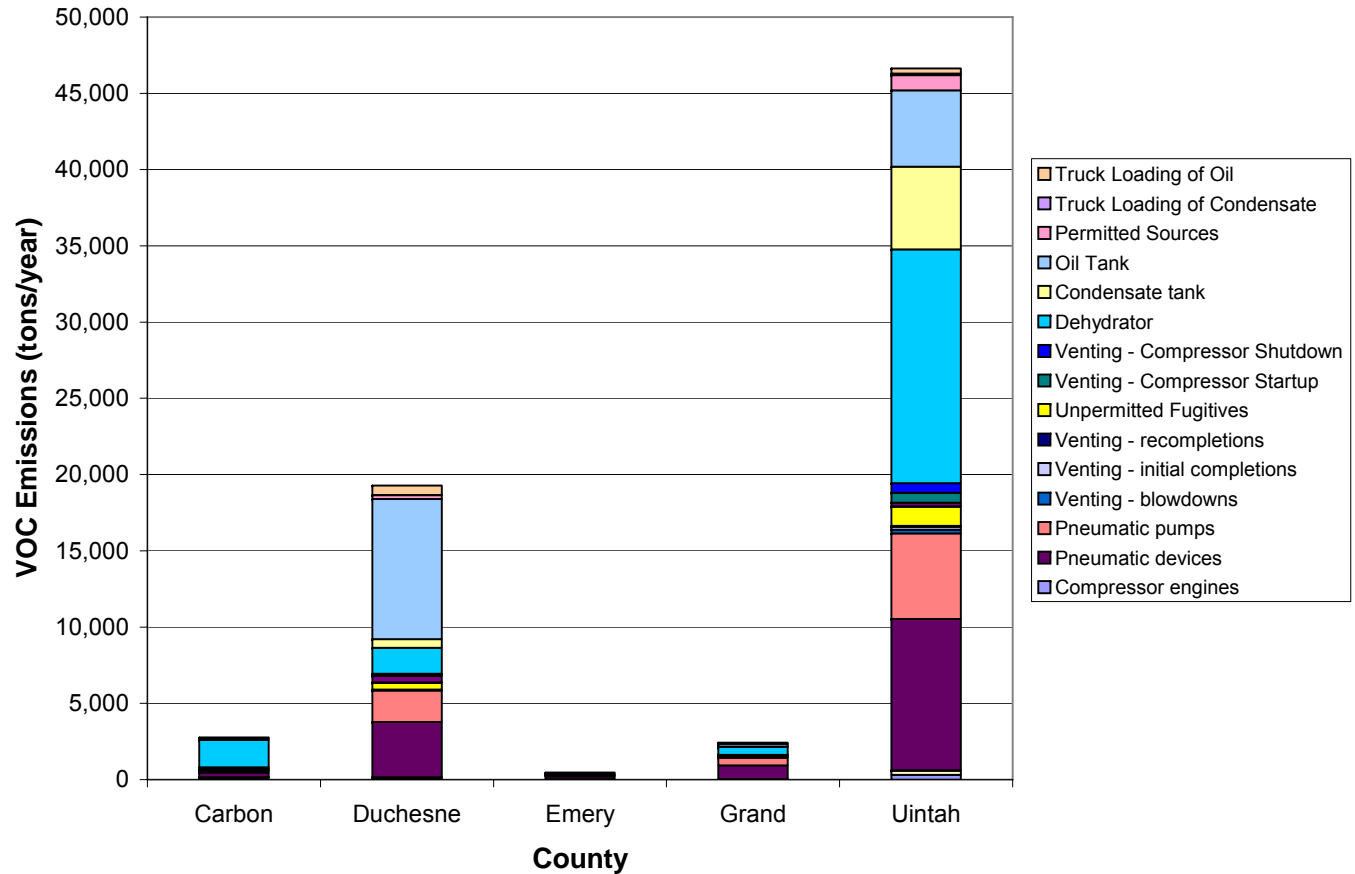
**Basin-wide NOx total:
13,093 (tpy)**



- Highest NOx emissions occur in Uintah and Duchesne Counties, with some additional NOx emissions in Carbon and Grand Counties

Uinta Basin 2006 Baseline Results VOC Emissions By County

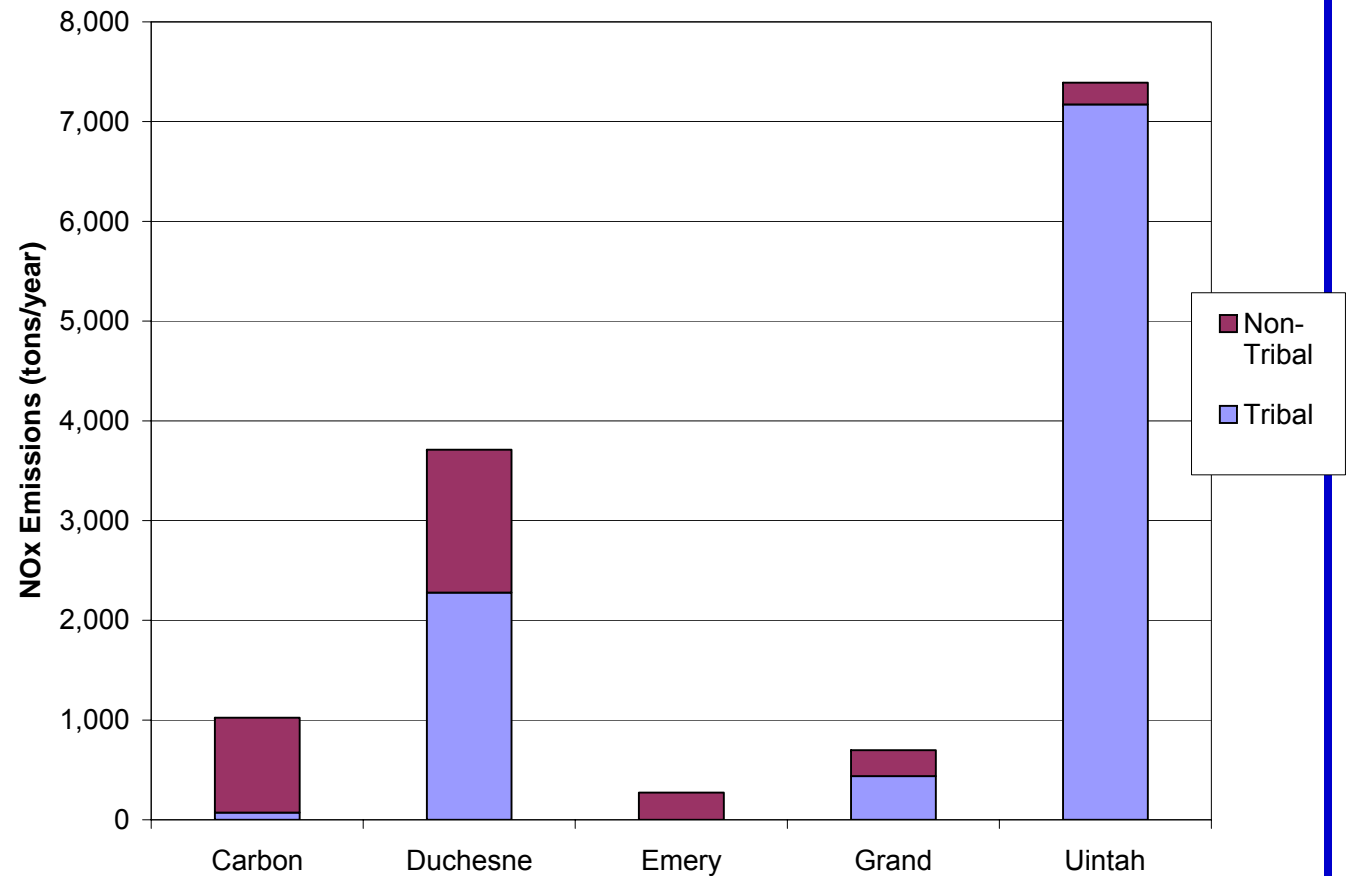
**Basin-wide VOC total:
71,546 (tpy)**



• VOC emissions occur primarily in Uintah and Duchesne Counties, with little additional VOC emissions in other counties

Uinta Basin 2006 Baseline Results NOx Emissions By County in the Tribal vs. Non-Tribal Airshed

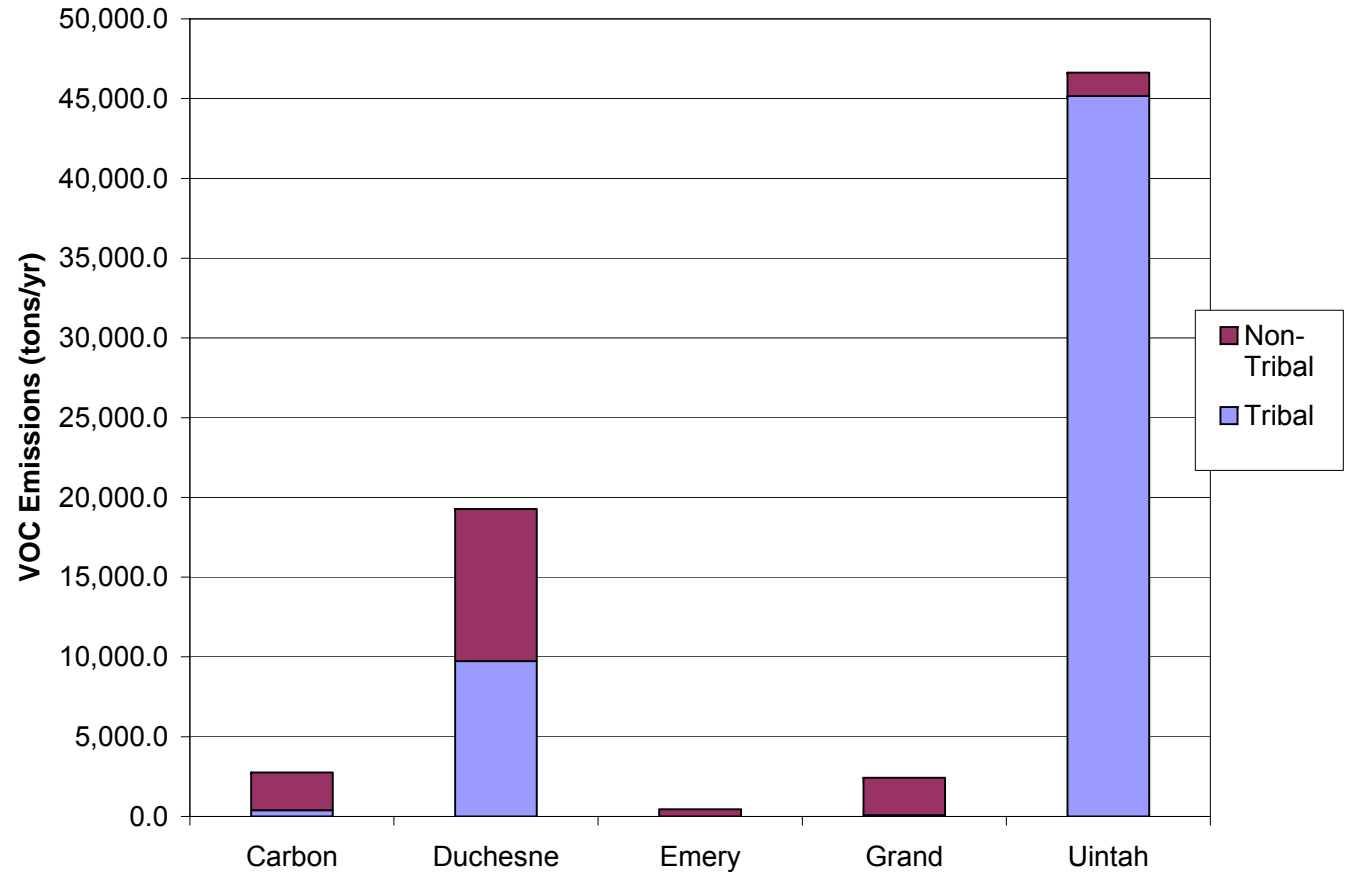
**Basin-wide NOx total:
13,093 (tpy)**



- NOx emissions in Uintah County are primarily within the tribal airshed, whereas in Duchesne County only approximately 60% of NOx emissions are in the tribal airshed

Uinta Basin 2006 Baseline Results VOC Emissions By County in the Tribal vs. Non-Tribal Airshed

Basin-wide VOC total:
71,546 (tpy)



- VOC emissions in Uintah County are primarily within the tribal airshed, whereas in Duchesne County only approximately 50% of VOC emissions are in the tribal airshed

Uinta 2006 Baseline Emissions - Observations

Basin	Well Count			Oil Production (bbl)			Gas Production (MCF)			Spud Counts
	total	CONV	CBM	Total	Oil Well Oil	Gas Well Condensate	Total	CONV	CBM	Total
D-J Basin	19,841	19,841	0	14,242,088	0	14,242,088	234,630,779	234,630,779	0	1500
Piceance Basin	6,315	6,255	60	7,158,305	5,755,076	1,403,229	421,358,666	420,165,237	1193429	1186
Uinta Basin	6,881	6,018	863	11,528,121	9,758,247	1,769,874	331,844,336	254,219,432	77,624,904	1069

Basin	Emissions (tons/yr)				
	NOx	VOC	CO	SOx	PM
D-J Basin	20,783	81,758	12,941	226	636
Piceance Basin	12,390	27,464	7,921	314	992
Uinta Basin	13,093	71,546	8,727	396	623

- Uinta Basin NOx emissions resemble those of Piceance Basin for the 2006 baseline, and are lower than the D-J Basin
- Uinta Basin E&P activity, similar to Piceance, is more recent than in the D-J Basin
- Uinta Basin VOC emissions resemble those of the D-J Basin and are significantly higher than the Piceance Basin, likely due to significant oil production and higher VOC content of produced gas on a basin-wide average basis

Phase III Schedule

Basin	2009								
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
San Juan (North)	█	█	█	█	█				
San Juan (South)	█	█	█	█	█				
Southwest Wyoming (Green River)	█	█	█	█	█	█	█	█	
Powder River	█	█	█	█	█	█	█		
Big Horn	█	█	█	█	█	█	█		
Wind River	█	█	█	█	█	█	█		
Williston			█	█	█	█	█	█	
Great Plains			█	█	█	█	█	█	
Far Future Year Projections (All Basins)						█	█	█	
Final Report								█	█

Surveys sent out to producers █
 Baseline 2006 emissions completed █
 Mid-term, baseline emissions and documentation completed █