Air Agencies Oil and Gas Emissions Inventory

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Abstract

In 2013 the Utah Division of Air Quality (UDAQ) along with EPA Region 8, and the Ute Tribe, started working to develop an up-to-date and improved oil and gas emissions inventory for the Basin. Previous inventories relied on for the Uinta Basin, Utah lacked the ability to capture the technological advancements that occurred over the period. This process involved the cooperation of various stakeholders, including federal and state regulators, oil and gas operators, and tribal entities. In 2015, an emissions inventory workbook and request for completion were sent to each Uinta Basin operator active in 2014. In 2016 the data was compiled into the 2014 Air Agencies Oil and Gas Emissions Inventory. UDAQ is now requiring triennial inventories for all oil and gas facilities on State jurisdiction and EPA Region 8 and the Ute Tribe are again participating to collect voluntary information on federal/tribal jurisdiction as well. The 2017 Air Agencies Oil and Gas Emissions Inventory is currently being finalized.

Background

The Uinta Basin, a structural basin located in the remote northeastern corner of the state of Utah, is the main oil and gas development hub in the state. In 2015, it was home to over 15,000 producing and shut-in oil and gas wells. The basin is also home to over 50,000 people, many of whom live within close proximity of the oil and gas infrastructure. During the 2009-2010 winter season, monitoring in the region indicated high ozone levels, including a 124 ppb average during an 8-hour time period at one monitoring station. Since that time, monitoring has increased in the region, identifying high ozone events, which regularly exceed the National Ambient Air Quality Standards (NAAQS) for ozone, 70 ppb.

In studies over the course of several winters in the Uinta Basin, VOC was identified as the main driver of ozone formation. Those same studies also identified the oil and gas industry as the majority contributing source of VOC in the region.

Air Quality modeling and planning efforts for the Uinta Basin, up until now have depended mainly on the information collected through a survey effort and presented in the 2006 WRAP Phase III oil and gas emissions inventory. Given the persistence and severity of the ozone issues in the Basin, and the impending likelihood of the region being designated as non-attainment, the Utah Division of Air Quality found it imperative that emission sources in the region begin to be better characterized, and that an improved oil and gas inventory is collected.

Another unique aspect of the Uinta Basin region is the shared jurisdiction that exists (Figure 1). The air jurisdiction is shared between the State, the federal government, specifically the Environmental Protection Agency (EPA), and the Ute Tribe. As a result of this shared jurisdiction over the airshed, the Utah Division of Air Quality reached out to EPA and the Ute Tribe, as collaborators on the oil and gas emissions inventory effort. Beginning in 2013 Utah Division of Air Quality (UDAQ) began a collaborative effort to develop a new and improved oil and gas emissions inventory for the Uinta Basin.

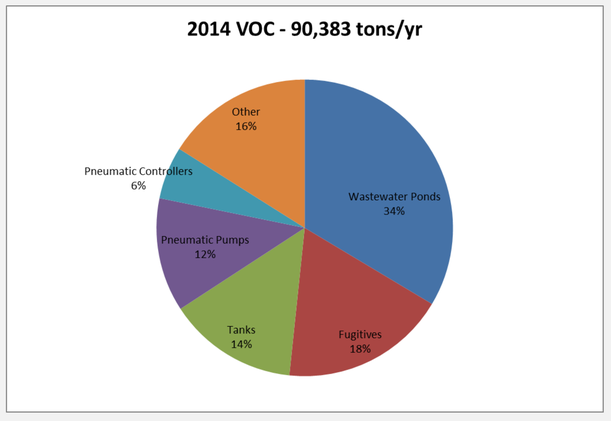
This was a successful effort with a high level of participation. It resulted in the most comprehensive oil and gas inventory for the region to date. Additionally, following the effort the Air Agencies recognized some additional emission sources that while not readily feasible to include in the original inventory effort were worthwhile to include in the final inventory. Additional sources were based on the WRAP Phase III emissions inventory and production data, the EPA oil and gas tool, and water sample composition data for waste water disposal facilities.

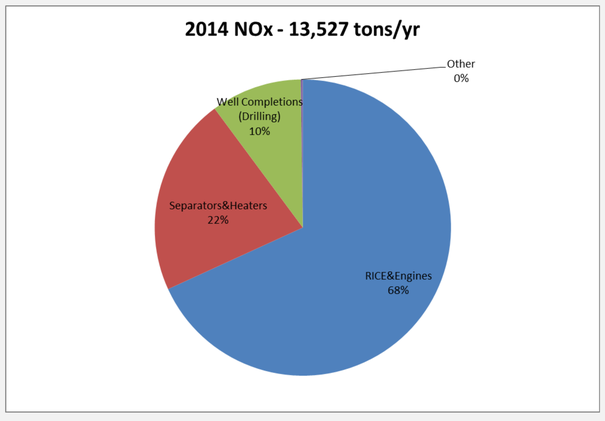
Additional Studies

- **Storage Tank Emissions Pilot Project (STEPP)** – Characterizing leak rate from controlled storage tanks (state jurisdiction only). Potential Inventory improvements.
- **ULend** – Infrared (IR) camera lending program, enabling LDAR programs, especially for small operators
- **Uinta Basin Aerial Survey** – Helicopter infrared camera survey characterizing the leak rate in the area.
- **Uinta Basin Composition Study** – Better composition (Which chemical species are in the VOC?) data for improvements to inventory, permitting, and modeling.

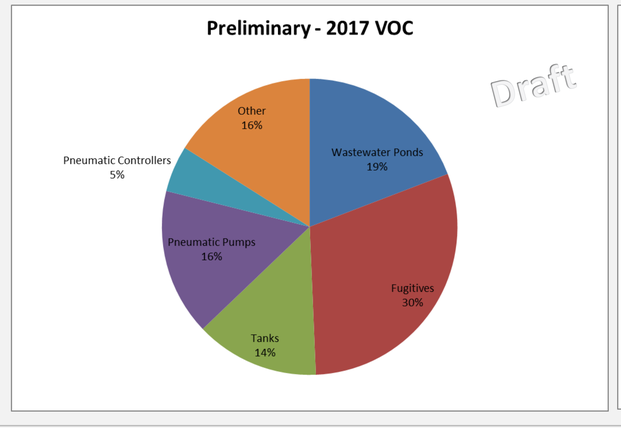
2014 Oil and Gas Emissions Inventory Results

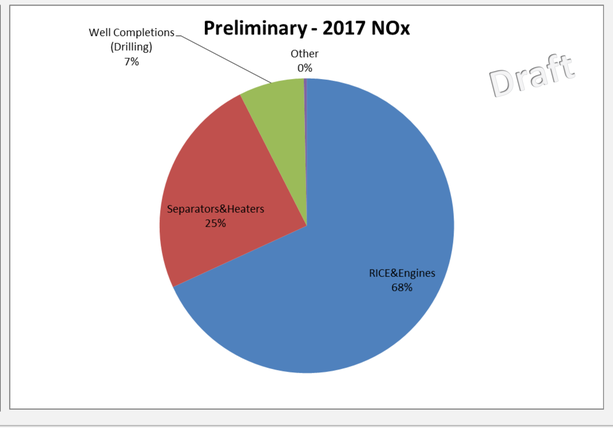
Description	NOx (tons/year)		VOCs (tons/year)		CO (tons/year)		SOx (tons/year)		PM10 (tons/year)		PM2.5 (tons/year)		CH2O (tons/year)	
	Duchesne	Uintah	Duchesne	Uintah	Duchesne	Uintah	Duchesne	Uintah	Duchesne	Uintah	Duchesne	Uintah	Duchesne	Uintah
2014 Utah O&G EI														
Dehydrators	1.96	4.49	198.93	3,686.73	8.68	12.47								
Fugitives			3,418.35	12,922.84										
Pneumatic Controllers			1,122.83	4,054.41										
Pneumatic Pumps			228.04	10,983.42										
RICE&Engines	4,178.51	5,043.82	699.03	974.17	5,020.94	3,877.55	5.03	17.41	155.60	100.08	155.60	100.08	269.18	258.41
Separators&Heaters	1,067.00	1,863.84	58.69	102.51	896.28	1,565.63	6.40	11.18	81.09	141.65	81.09	141.65		
Tanks	12.30	11.33	4,322.35	8,469.74	44.60	37.68								
Truck Loading			928.30	726.60										
Well Completions (Drilling)	408.84	933.96	284.41	654.28	154.06	361.28			8.89	34.98	8.89	34.98		
2014 WRAP Projection Estimates														
Condensate tank flaring	0.16	0.32	0.00	0.00	0.89	1.72	0.00	0.00	0.00	0.00				
Venting - blowdowns	0.00	0.00	60.09	350.50	0.00	0.00	0.00	0.00	0.00	0.00				
Venting - initial completions	0.00	0.00	41.92	69.47	0.00	0.00	0.00	0.00	0.00	0.00				
Venting - recompletions	0.00	0.00	6.48	10.73	0.00	0.00	0.00	0.00	0.00	0.00				
Gas Plant Truck Loading	0.00	0.00	0.15	3.62	0.00	0.00	0.00	0.00	0.00	0.00				
Venting - Compressor Startup	0.00	0.00	169.81	990.51	0.00	0.00	0.00	0.00	0.00	0.00				
Venting - Compressor Shutdown	0.00	0.00	160.95	938.84	0.00	0.00	0.00	0.00	0.00	0.00				
Dehydrator Flaring	0.02	0.11	0.00	0.00	0.10	0.59	0.00	0.00	0.00	0.00				
Initial completion Flaring	0.20	0.12	0.00	0.00	1.08	0.66	0.00	0.00	0.00	0.00				
Additional Sources														
Wastewater Ponds			9,533.26	20,812.91										
Solid Waste Disposal			433.77	266.84										
Oil and Gas Tool														
2310111100: Oil & Gas: On-Shore Oil Explor: Mud Degassing			1,640.31	943.54										
2310121100: Oil & Gas: On-Shore Gas Explor: Mud Degassing			1.78	112.38										
All Sources														
County Total (Duchesne & Uitnah)	**5,668.99**	**7,858.00**	**23,309.45**	**67,074.04**	**6,126.62**	**5,857.58**	**11.43**	**28.59**	**245.58**	**276.71**	**245.58**	**276.71**	**269.18**	**258.41**
Combined Total (Duchesne + Uintah)	**13,527.00**		**90,383.49**		**11,984.20**		**40.02**		**522.29**		**522.29**		**527.59**	





2017 – Oil and Gas Emissions Inventory SNEAK PEEK (Preliminary)





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