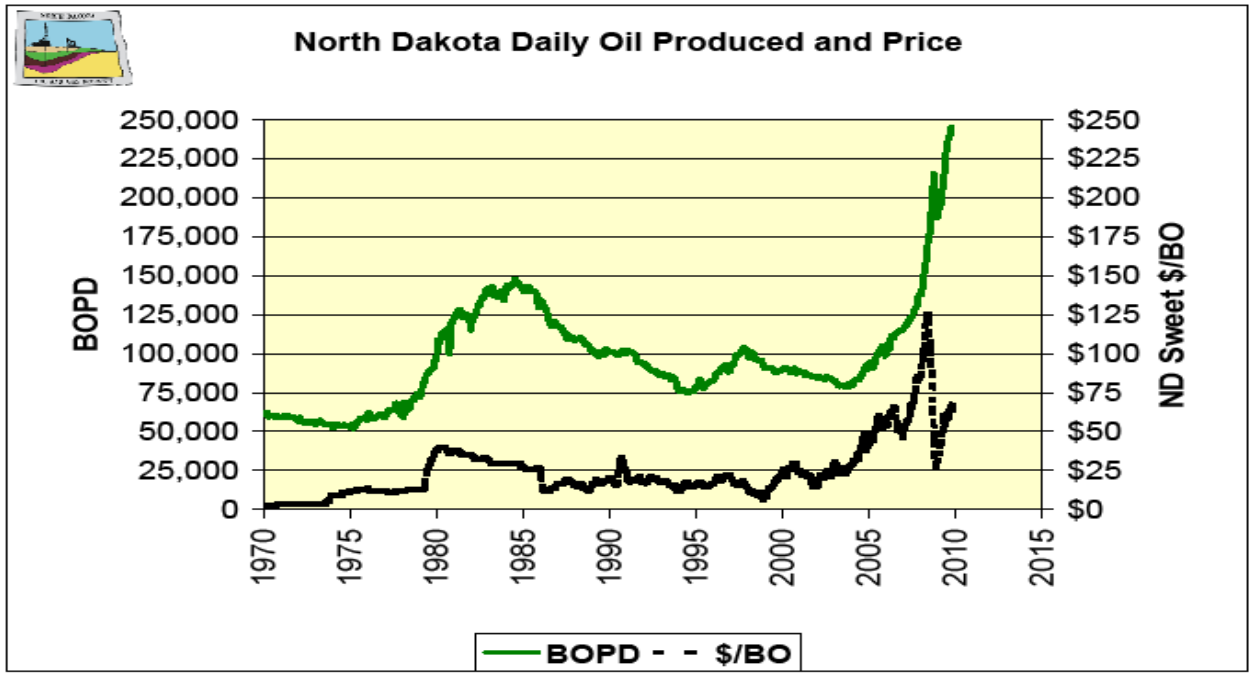
Bakken VOC Emission Control Solutions Session March 23, 2010

Bakken VOC Task Force Chairman

Brent Miller – Whiting Petroleum

North Dakota Oil Production

- $80 Oil Prices fuel continued records in ND oil production.
- We could reach 400,000 to 600,000 BOPD within 3 years.



Flash VOC Emission Estimation Which Techniques Work Best?

- GOR – Sample analysis
- Simplest method, sample oil from oil dump and send to the lab.
- Results limited to conditions at the time of the sample.

Flash VOC Emission Estimation Which Techniques Work Best?

- Vasquez – Beggs Correlation
- Bakken Crude does not fit this correlation. Other crude oils in ND fit well.
- For Bakken Crude – Use another method.

Flash VOC Emission Estimation Which Techniques Work Best?

- HYSIS model
- This model can work well if you have good separation.
- Get a Chemical Engineering Degree
- This model can be difficult.

Flash VOC Emission Estimation Which Techniques Work Best?

- E&P Tank model
- This model can work well with some significant fine tuning specific for the Bakken crude.
- A great tool once tuned and is known to be conservative.

Flash VOC Emission Estimation Which Techniques Work Best?

- Direct Measurement
- Everything Discussed above is compared to Direct Measurement
- Put a meter on your vent line and measure the volume you are venting
- Truck Sales during tests can skew results – Use a data logger.

Potential Control Solutions
Flare Systems

- Use high destruction systems designed for cold weather – 98%+ destruction.
- We need to aim for emissions well under the 100 ton/year limit per facility.
- If you can’t get there, use something else.

Potential Control Solutions Stabilizers and Separators

- Stabilizers keep flash gas out of the tanks and put it in the pipeline.
- You need to compare energy use and operational issues with other solutions.
- Horizontal treaters work better for separating gas and oil.

Potential Control Solutions Vapor Recovery Units

- VRU's compress tank vapors and put them in your pipeline.
- This can be an economic solution if you have enough tank vapors.
- Compare cost, energy use and operational issues with the extra revenue from recovering the gas. The gas could be 2000 btu & high GPM
- Do not put a vacuum on your tanks with a VRU.

What Else Should The Oil Industry Be Doing?

- Green Completions – Build your tank battery and your gas pipeline before you complete your well.
- Have control systems installed with your tank battery.
- Use central tank batteries for all wells within a spacing unit to reduce control system costs, pipeline costs and facility costs.
- Work with the NDHD.

Questions?

What should the Task Force do next?