

O&G Workgroup June 2, 2009 Call Notes
Lee Gribovicz, WRAP Air Quality Manager

To Members of the WRAP Oil & Gas Workgroup and Interested Stakeholders: We held our seventh call with interested O&G Stakeholders on Tuesday June 2nd, with about 25 participants signed on from State Air Agencies, Federal Land Managers, EPA, Environmental Interest Groups and O&G Industry representatives.

The first item on the agenda for this call was to hear results of the Phase III WRAP/IPAMS Emission Inventory for the fourth basin completed under the project; the North San Juan Basin of southwestern Colorado. We also heard a quick status on the proposal for undertaking the Piceance Pilot Project (P3) for assessing Mobile Source Emissions from western O&G operations. And then we heard from BLM representatives on their “Best Management Practices” project for protecting Air Quality Resource from O&G operations. Finally, we scheduled the **next Conference Call of this O&G Workgroup for Wednesday, August 5, 2009 at 10 AM Mountain Time**. Participants will call in to the WRAP Conference number at 1-866-206-0240, using Access Code 323375. The agenda for this next call will be developed and mailed to you later.

Phase III Emission Inventory Project San Juan Basin Results: Amnon Bar-Ilan of the Environ Staff began by giving a brief Overview of the Phase III Emission Inventory Project, noting that more detailed description of the project methodology had been included in previous Workgroup calls. Then he gave a more detailed summary of the results obtained for the North San Juan Basin in southwestern Colorado Environ’s presentation is available on the WRAP Calendar Notice for this call at:

<http://wrapair.org/cal/calendar.php?op=view&id=1541>

The North San Juan Basin Inventory Reports for 2006 & 2012 will appear with the other completed basins (Denver-Julesburg, Piceance & Uinta) on the WRAP website (North San Juan expected to be received and posted on the site by June 5th). The page is accessed from the “Phase III Inventories” link from the “Oil & Gas Workgroup” page at:

http://www.wrapair.org/forums/ogwg/PhaseIII_Inventory.html

Amnon noted that O&G operations don’t always follow artificial political boundaries like State lines, so even though the North and South San Juan Basins are in the same geologic formation, they were divided up for the Phase III Inventories project to reflect the portions located in Colorado (North San Juan) as differentiated from O&G operations in New Mexico (South San Juan). Amnon noted that the Scope of the Phase III project covers point and area sources, excluding most of the on and non-road mobile sources (drill rigs being the major exception). The Phase III Scope includes criteria pollutants (NO_x, VOC’s, SO₂, PM, CO and NH₃), but excludes other pollutants such as Greenhouse Gasses (GHG) and Hazardous Air Pollutants (HAP’s). The temporal scale of the project includes producing a 2006 current baseline inventory for each basin, along with a mid-term projection to 2012 (exception was for the Denver-Julesburg mid-term which targeted 2010 for use in Colorado Ozone SIP planning). And plans call for a far future projection to 2018 for each basin, but because of the larger uncertainty in projecting that far out these 2018 projections won’t be completed until the last stage of the project.

In the case of the North San Juan Basin, the overwhelming majority of production comes from Southern Ute Indian Tribe (SUIT) lands. The BLM has recently completed a “Programmatic Environmental Assessment (PEA)” for future infill drilling on these tribal lands (<http://ocs.fortlewis.edu/BLMPEA/>), which included detailed baseline and future year projection emission inventories. So Environ accepted those inventories directly, rather than going through detailed recalculation of emissions. However for the minority of State or Fee lands within the North San Juan with O&G operations, the same project methodology designed for previous Phase III work, was used to add those emissions to the basin wide totals. For North San Juan this consisted primarily of research into the Colorado Department of Public Health & Environment (CDPHE) “Air Pollution

Emission Notices (APEN's)" database where emission reports cover down to 2 TPY as stationary point sources. Thus many O&G sources traditionally classified as area sources under 100 TPY in other states (e.g./ individual compressors, dehydrators, tank vents, etc.), have actual emissions data available in Colorado.

The primary emissions of concern from O&G operations are NO_x and VOC's, so even though other pollutant totals are available in the final reports, Environ presentations focus on these two pollutants. The baseline 2006 North San Juan inventory the basin showed 5,701 TPY of NO_x, almost all of which comes from compressor engines. This is different from previous inventories where drill rigs were also big NO_x emitters, because comparatively little active drilling was going on in North San Juan during the base 2006 calendar year. The VOC total was 2,152 TPY, with the biggest contributor again being compressor engines. Again this is different from previous basins because the dominant type of production in North San Juan is coal bed methane (CBM) wells which have very little VOC content in their gas and very low condensate volumes (traditionally a large source of VOC emissions). Comparison against previous basins showed that the North San Juan basin has the smallest emission totals for pollutants of any basin thus completed under the Phase III Project.

For mid-term projections Environ uses historical trends for the major calculation parameters; those being gas production, oil production, existing well count and spud count (new drilling). In the case of North San Juan, BLM's PEA was used as a source of those production parameters. Scaling factors show that without the infill drilling, well production declines result in about half the gas production in 2012, and about the same oil production rates. "On the Books" state and federal emission control regulations applied to the production parameters show a shade under 3,000 TPY of NO_x and around 1,100 TPY of VOC in that future year.

Next up for completion is the South San Juan Basin inventory, followed by four Wyoming Basins (Southwest [Green River], Powder River, Bighorn & Wind River), the Williston Basin (primarily in western North Dakota) and the Great Plains Basin (primarily in eastern Montana). The schedule keeps slipping somewhat, with dates a month or so later than predicted in the March update. Timing for reports of future basins looks like completion of the South San Juan inventory in late June, the simpler Powder & Wind River Wyoming Basins around the end of July, the more complicated Big Horn & Green River Wyoming Basins around the end of August, and the North Dakota and Montana Basins at the end of September. The last portion of the project will be the 2018 long term projections which are inherently more difficult because of the greater uncertainty present in those intervening years, and the final report is now anticipated somewhere around the first part of November '09.

Mobile Source Emissions Pilot Project Status: After the North San Juan Basin report, we had a brief status report on the P3 Mobile Source Emissions Pilot Project. The Final February 25, 2009 Scope of Work for this project is available on the last O&G Workgroup Call Notice on the WRAP Calendar at the following link:

<http://wrapair.org/cal/calendar.php?op=view&id=1235>

The primary objectives of this P3 project are to: (1) Quantify the emission totals of Mobile Onroad & Nonroad emissions sources present in O&G Field operations in a selected pilot location (Piceance Basin), (2) Make comparisons of these emissions against existing WRAP county wide Mobile Source Emission Inventories to determine the potential for double counting (3) Make estimates of the relative contribution of these mobile emissions as compared to the point and area source emissions already captured in the existing IPAMS/WRAP Phase III O&G Emission Inventory (4) determine the representativeness of the results for application at other O&G operations in the WRAP Region and (5) to make recommendations of mitigation options for these emissions.

Environ has been preparing a proposal for undertaking P3, but needs the cooperation of Piceance Basin operators to provide activity data for emissions calculations. If the operators aren't willing to provide a majority of the data, the costs would likely be much higher to complete "on the ground" evaluations and traffic counts. And since mobile source emissions are traditionally regulated, the O&G industry would be providing information that is not strictly required by any regulation. So there is an outreach effort going on to provide a

rationale and commitment for industry's cooperation. Environ anticipates that they will be able to provide a firm proposal with good cost information later this month.

Because the WRAP's current funding is extremely limited until the Regional Haze SIP's are completed, there are no WRAP funds to pay for this Pilot Study. State partners with significant O&G impact were approached to consider funding the study and Colorado's Air Program is looking at ways they might find the necessary funding for the Piceance Basin work. But their participation is contingent how much the study might eventually cost.

BLM Best Management Practices Presentation: The BLM has been working on a Best Management Practices (BMP's) presentation listing control measures used for air pollution mitigation in the O&G Production Fields (the PowerPoint file is posted on the "1541" WRAP Calendar Call Notice link for this call listed above). This date Angela Zahniser and Jim Perry gave the Workgroup an overview of this BMP project and the O&G Air Resources BMP presentation.

Angela began by noting that there has been a great interest in O&G development in the west in recent years and since BLM was the agency responsible for leasing a vast majority of these O&G lands, they undertook to compile listings of BMP's to mitigate the impacts from these leases. The BLM's Minerals section has already put together a listing of BMP's for Visual Resources, Operations and Wildlife Resources. These BMP's are posted at the BLM's Best Management Practice website at:

http://www.blm.gov/wo/st/en/prog/energy/oil_gas/best_management_practices.html

To stimulate discussions among BLM Staff and stakeholders, and to provide a visual aide for BLM training sessions, Jim Perry headed an effort to produce a BMP presentation for Air Resources. This Air Resources presentation is intended to provide an educational menu of options that are easily accessible and understandable for the average oil and gas natural resource specialist and operator, and once finished, it will eventually be posted on their BMP webpage, with the other existing BMP presentations.

This date Jim Perry went through the slides for the Workgroup and provided insight into the content and suggestions presented. The current Air Resources BMP document covers four areas of O&G activity: 1) Transport, 2) Drilling, 3) Production and 4) Monitoring & Maintenance. The basic content of the BMP's covered is outlined below:

1) Transport BMP's

- Directional Drilling: reduces pad construction, road network and associated traffic dust & emissions
- Centralized Water Storage/Delivery: reduces water hauling and associated traffic dust & emissions
- Centralized Fracturing: hard line frac pipes serving multiple wells
- Liquid Gathering Systems w/ Offsite Collection: piping produced fluids to centralized tankage near major established roads
- Telemetry/Well Automation: reduces service truck traffic and associated traffic dust & emissions
- Road Dust Control: water, chemicals (temporary) to paving (more cost effective for high volumes)
- Speed Reduction: reduces per mile dust emissions
- Van Pooling: reduces employee access traffic and associated traffic dust & emissions

2) Drilling Phase BMP's

- Cleaner Drill Rig Engines: Tier 1 (dirtiest) moving toward Tier 4 (cleanest)
- Natural Gas Power: replaces dirtier diesel power engines
- Green Well Completions: captures gas that otherwise is either vented or flared

3) Production Phase BMP's

- Solar Power (for chemical pumps & well monitoring telemetry): reduces service truck traffic and

associated traffic dust & emissions

- Electric Powered Engines: replaces natural gas or diesel firing in the well field
- Fugitive Emission Control: using closed tankage with vapor recovery in place of open pits recovers saleable product and has an economic return
- Optimized Glycol Circulation: reduces excess emissions from over-circulation on glycol dehydrators
- Flash Tank Separators: captures and recycles methane from rich glycol dehydrator strippers
- Compressor Engine Controls: Low NO_x controlled engines, catalytic converters, air/fuel ratio controllers, Selective Catalytic Reduction (SCR), Ultra Low Sulfur Diesel (USLD) for diesel fired engines
- Dry Centrifugal Compressor Seals: replacing wet seals reduces fugitive methane leaks, recovers saleable product and has an economic return
- Compressor Rod Packing Maintenance: new packing reduces leaks from 900 CFH to 60 CFH, recovers saleable product and has an economic return
- Low Bleed Pneumatic Controllers: reduces emissions from pneumatic control systems
- Plunger Lift Systems & “Smart” Automation: reduces well blowdown emissions

4) Monitoring & Maintenance BMP’s

- Directed Inspection & Maintenance: reduces fugitive emissions from leaks in piping flanges, tank seals, etc – using Leak Detection (infrared cameras, organic vapor analyzers, soap solutions, ultrasonic detectors) and Measurement Techniques (calibrated bagging, rotameters, high volume samplers)
- Air Quality Monitoring: detects emissions to facilitate development and emission control planning

The BLM is still looking to improve and expand the Air Resources presentation, and earlier this year the WRAP O&G Workgroup was solicited for review and suggestions on an earlier draft. A number of Workgroup members provided feedback at that time, and the Presentation has evolved to the May 26th version shown on today’s call. If reviewers find errors or have additional material for inclusions please contact BLM staff at:

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Thanks always for your interest and participation.Lee

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