WESTERN ENERGY
ALLIANCE

December 23, 2013

Alan Humphreys
Utah Division of Air Quality
Multi Agency State Office Building
195 North 1950 West
Salt Lake City, UT 84116

Dear Mr. Humphreys:

Below are comments and questions of clarification from our member companies that operate in Utah on the draft proposed Utah Division of Air Quality (UDAQ) General Approval Order for Oil and Natural Gas (GAO). These comments are based on the draft GAO and application form you sent to us on December 12th, and they include issues **deemed highest priority** by our members. Thank you for continuing to work with us as you develop the GAO. We hope the comments below will be helpful to UDAQ.

Please note that on December 20th, several of our members discussed concerns regarding the current form of the GAO with Bryce Bird via telephone. That discussion concluded with the suggestion that a meeting be scheduled as soon as possible after the New Year holiday to continue work on the outstanding issues. We look forward to that event.

<u>Modeling and Stack Height Requirements</u>

The draft proposed GAO states that stack heights will be determined based on modeling. Our understanding is that UDAQ will be using 1-hr modeling to determine the appropriate stack heights. Relying on 1-hr modeling to determine stack heights will result in unnecessary costs as well as stack height constraints that may raise safety and operational issues (e.g. back pressure). The inability of air quality models to accurately predict 1-hr concentrations is well documented. The enclosed letter from the Western States Air Resources Council (WESTAR) to EPA requests that EPA conduct critically needed field studies to resolve 1-hr NO_2 modeling issues. The enclosed background document, written by the WESTAR 1-hr NO_2 modeling ad hoc committee (of which UDAQ staff were members) points out the model's "tendency to overestimate 1-hr NO_2 impacts," and says, "... it is possible that modeled concentrations exceed the standard when monitoring indicates compliance with the standard." Given these concerns with the accuracy of 1-hr NO_2 models, UDAQ should not rely solely on model results to determine NAAQS compliance.

There is sufficient information to demonstrate that a facility authorized under the GAO will not interfere with the attainment of the 1-hr NO_2 standard. Western Energy Alliance suggests contacting other States regarding their 1-hr modeling issues, such as Wyoming. Wyoming conducted an extensive amount of modeling for several facilities to determine the impact of the 1-hr standard on permitting. None showed compliance with the 1-hr standard unless unreasonable stack heights were used. Based on this modeling, it was clear that requiring applicants to demonstrate compliance with the 1-hr standard, via modeling, was not a viable path for minor sources going forward. Instead they rely on the extensive ambient monitoring program data to make a demonstration that the proposed facility will not prevent attainment with the 1-hr NO_2 ambient standard. We believe Utah's extensive ambient monitoring program is equivalent and allow UDAQ to adopt this same approach. We request that UDAQ consider these and other state regulations that will allow for reasonable GAO requirements while still demonstrating NAAQS compliance. If stack heights are so high as to be technically infeasible, operators will not be able to use the GAO and will have to file NOIs for individual approval orders (AO).

LDAR

We are concerned with a lack of specificity in the Leak Detection and Repair (LDAR) provisions in the draft GAO. We suggest that the rule include the following elements:

1) Provisions for difficult or unsafe to monitor components
2) Provisions for delay of repair - For example, a repair could require backordered parts or a shutdown, which needs to be scheduled appropriately.
3) Exclusions for lines and components in non-hydrocarbon service - As drafted, the LDAR provisions are required on ALL components at a facility
4) Exclusions for small diameter lines - We suggest a ½" threshold.
5) Applicability thresholds - As drafted, the GAO requires an IR camera survey every 6 months regardless of potential to emit.
6) Step down provision – Survey frequency is reduced if leaks are not regularly detected at a site.
7) A clearer definition stating that only equipment owned and operated is to be surveyed – Operators cannot survey equipment that is owned by other companies, such as the meter skid owned by a gas gathering company.

Consolidation

Operators installing new equipment in the Uinta Basin are consolidating sites and equipment as much as possible to increase operational efficiency, decrease surface disturbance and reduce their environmental impact. Both EPA and BLM are also encouraging this trend through their regulations and requirements. By focusing on prescriptive capacity applicability standard, the GAO will discourage this beneficial consolidation or limit utilization of the GAO. We suggest site-wide emission limits rather than prescriptive equipment specifications. For example:

1. **Storage Capacity**

   The draft proposed GAO has a total site-wide produced fluids capacity of 2,200 bbls and max individual or emergency/overflow tank capacity of 550 bbls. Operators are moving towards larger tank batteries in an effort to consolidate their operations and reduce their surface impacts. By limiting the site-wide capacity to 2200 bbls, UDAQ is discouraging consolidation of tank batteries, which is counter to EPA's recent NSPS OOOO rule for storage vessels.

Western Energy Alliance also suggests removing limits on individual tank sizes. Some operators are moving to 600 bbl tanks, and operational flexibility can be retained without increasing site-wide emissions.

2. **Dehydrator Capacity**
The draft proposed GAO has capacity limit of 1.0 MMscf/day. The most common sizes of field natural gas dehydration units range from 1 to 2 MMscf/day. Establishing a maximum capacity of 2 MMscf/day would encompass most field installations and will also coincide with the MACT HH applicability threshold of 2 MMscf/day. Although many of the dehydrators in the basin are currently at or below 1.0 MMscf/day, operators are often installing 2.0 MMscf/day dehydrators, which allows for greater site consolidation and reduced surface impact. Additionally, data demonstrates that there is no significant difference in emissions between a 1.0 MMscf/day unit and a 2.0 MMscf/day unit.

3. **Methanol and Glycol Storage Capacity**
The draft proposed GAO has a total site-wide methanol and glycol storage capacity of 500 gallons. Where present, methanol tanks and glycol storage tanks are typically 500 gallons. This is a standard size in the industry and a standard size provided by the methanol and ethylene glycol suppliers who also frequently provide us with the tanks to store their product. A larger site-wide capacity is needed to allow for adequate storage of both chemicals on location if needed.

Furthermore, emissions from methanol and glycol tanks are negligible so limiting the site-wide capacity is unnecessary to for emissions reduction. For example, one operator calculated the annual emissions from glycol and methanol tanks to be 0.02 pounds/year and 8 pounds/year, respectively, under typical operations. (Note that this analysis has been submitted to UDAQ for review and the data is enclosed.) We suggest these tanks be treated as ancillary equipment listed for informational purposes and that a site-wide storage capacity limit not be included for them.

4. **Engine Capacity**
The draft proposed GAO limits engines to 100hp, which is very limiting and forces operators away from consolidation of sites and equipment. Consolidated sites with larger engines would be subject to greater controls, resulting in lower overall emissions. . In addition, the GAO requires all engines to meet EPA NSPS JJJJ requirements, which are the same for engines between 100hp and 500hp.

Many tank batteries are in remote areas with no electrical infrastructure available, and the addition of a vapor recovery unit (VRU), as may be required by other sections of the GAO, could increase onsite horsepower needs. As written, we believe the GAO will limit application vapor recovery.

5. **Overall Site-wide Capacity**
   We appreciate that UDAQ has increased their site-wide throughput capacity in the process of drafting the GAO. However, the 50,000 bbl/yr throughput limitation may not accommodate horizontal wells or multi-well tank batteries. Note that 50,000 bbls/year equates to just 137 bbl/day. This applicability limit will likely foreclose on centralized tank batteries and the associated high level of tank emission controls.

VOC Control Efficiency
The draft proposed GAO has a control efficiency of 98% regardless of the control technology. During the development of NSPS OOOO, EPA clearly disagreed with comments asserting that 98% control is technically achievable on a continuous basis for all technologies and further states that data clearly supports that certain controls can only achieve 95% reduction. While 98% is achievable for some combustion devices such as flares and vapor combustors, other existing and innovative technologies may not be able to achieve 98%. Western Energy Alliance suggests limiting the scope of the 98% requirement to specific combustion technologies and allowing 95% for other control devices such as VRUs. The 98% control requirement reduces operational flexibility and essentially requires operators to flare, which causes further emissions. It also discourages innovation of new control technology that could eliminate the emissions associated with flaring. Western Energy Alliance further asserts that in some applications the use of a combustion device is not cost effective.

We also believe that VRUs are process equipment rather than control equipment. EPA considers VRUs to be process equipment in NSPS OOOO, and VRUs have been considered process equipment in other scenarios. The potential to emit for a tank battery should be based on the VRU as part of the facility process rather than as a control device.

Preconstruction Approval
Western Energy Alliance continues to have concerns regarding preconstruction approval requirements for a GAO. Form 1 General Information (Application to the GAO) requires the GAO approval letter from UDAQ be issued before construction or installation, but there are several problems with combining that requirement with other data requests in Form 1. Item 12b requires confirmation that the site will have an annual throughput of crude oil and condensate less than or equal to 50,000 bbls/year, but we cannot confirm the throughput of a site *before* the well has been drilled. Also, Form 1 requires the requested information to be accurate and complete. We cannot verify the accuracy of the information required in Item 12a and 12b until the site has been constructed and we know what equipment was installed and the well production rate. We suggest that UDAQ remove the specific data requirements from the Form 1 application and request that data within the records section of the GAO (Section I.4). Basin operators support providing preconstruction *notice* to DAQ of intent to apply for coverage under the GAO with a post construction throughput and equipment inventory report.

Issues for Clarification

There are some sections in the draft GAO and the Form 1 General Information (Application to the GAO) that raised questions of clarification from our companies. These generally pertain to the eligibility of a site to be covered under the GAO.

- If a facility finds that they are exceeding the 50,000 bbl/yr capacity, the GAO does not refer to the allowable timing to convert into a NOI. We propose UDAQ include language that specifies that once a facility recognizes that it will not meet the annual capacity requirement, it will apply for a NOI within a certain time. If emissions thresholds are ultimately utilized as suggested above, and those thresholds are exceeded due to well productivity exceeding expectations, the same sort of opportunity to provide a timely NOI for an Approval Order (AO) should be provided.

- Item 10 in Form 1 requests identification of any existing AOs for the site, but Item 12a on the same form requires certification that the source is not subject to an AO.

Thank you for the opportunity to comment on the draft GAO and for working with industry as you refine the proposed rule. We appreciate your interest in our feedback and look forward to continued discussion. Please do not hesitate to contact us if you have questions.

Sincerely,

Kathleen M. Sgamma
Vice President of Government & Public Affairs

Cc: Amanda Smith, Executive Director, Utah Department of Environmental Quality
Bryce Bird, UDAQ Director
Brock LeBaron, UDAQ Deputy Division Director

Enclosures (3)

WESTERN STATES AIR RESOURCES COUNCIL

WESTAR

December 13, 2012

Mr. Richard Wayland, Director
Air Quality Assessment Division
Office of Air Quality Planning & Standards
109 T.W. Alexander Drive (Mail Code: C304-02)
Research Triangle Park, NC 27709

Dear Mr. Wayland,

The Western States Air Resources Council (WESTAR) highly commends the U.S. Environmental Protection Agency (EPA) for establishing the NO_2/NOx in-stack ratio database on August 30, 2012 to assist in modeling compliance with the 1-hour Nitrogen Dioxide (NO_2) National Ambient Air Quality Standard (NAAQS). WESTAR will strongly encourage WESTAR members to participate by contributing to the database.

WESTAR is also grateful for the opportunity to submit suggestions to the EPA on the 1-hour NO_2 NAAQS. Specifically, WESTAR requests that EPA:1) adopta higher significant impact level (SIL) in pending rulemaking; 2) support the use of higher interim SILs for current permitting activities by WESTAR's member agencies; and 3) assume responsibility for further field studies of isolated sources to improve AERMOD accuracy, or provide technical and financial assistance for such studies. Additionally, WESTAR is reviewing the treatment of intermittent emissions and may offer comments in the future.

BACKGROUND:

On April 12, 2010, the EPA enacted a new 1-hour NO_2 NAAQS. This new standard has presented state and local air agencies with a host of challenges when implementing the new standard under their New Source Review (NSR) permitting programs. EPA attempted to address the problems by issuing guidance memorandums (dated June 28 and June 29, 2010, and March 1, 2011) to provide further clarification and guidance on the application of Appendix W for this standard.

Last year, WESTAR's Air Directors directed WESTAR staff to form an ad hoc committee to review the new modeling requirements, identify key issues related to its implementation, and to determine possible solutions to those issues, as they relate to the use of EPA dispersion model and Appendix W.

In response, a 1-hour NO_2 modeling ad hoc committee was convened. The committee consists of Phil Allen (Oregon DEQ), Clint Bowman (WA DOE), Cyra Cain (MT DEQ), Tom Orth (UT DEQ), David Prey (UT DEQ), Alan Schuler (AK DEC), and Jeff Gabler (WESTAR). Many conference calls were conducted to discuss the issues. Air modeling experts from EPA and other state agency staff were, at times, included in the discussions as the group attempted to better understand the complexity of the issues associated with implementing the new standard.

SIGNIFICANT IMPACT LEVEL (SIL)

A problematic issue identified by the ad hoc committee relates to EPA-proposed SIL for 1-hour NO_2 of 4ppb or 7.5$\mu g/m^3$. The EPA has suggested that states can use the proposed SIL as an interim value until a new 1-hour NO_2 SIL is adopted. In its comments, EPA acknowledges that air agencies are not bound by the value, and that states may choose a different interim value until the 1-hour NO_2 SIL is finalized. Prior to EPA's recommendation, the Northeast States for Coordinated Air Use Management (NESCAUM) recommended a value of 10 $\mu g/m^3$.

While EPA's choice of a SIL value is consistent with other criteria pollutant SILs (usually 1-4% of the NAAQS), the current SILs are based on 24-hour and annual-averaging periods, where multiple single-hour concentration predictions are averaged over time. Compliance with the new 1-hour NO_2 NAAQS is based on a single hour's predicted concentration within the AERMOD modeling system, the one-hour daily maximum. Single-hour predictions generally consume a greater percentage of the standard they are compared to, whereas, multi-hour predictions will be less sensitive to the standard, since the hourly contribution varies widely from hour to hour. In short, a one-hour modeling prediction is considerably more sensitive to the SILs than those based on multiple hours.

The primary concern identified by the ad hoc committee is that nearly all of their permit applicants will trigger the requirement for a cumulative analysis at the proposed 1-hour NO_2 SIL level. Impacts from sources modeling under the new 1-hour NO_2 standard are generally very local to the subject source, and are less sensitive to surrounding sources, especially when sources are separated by several kilometers or more. Requiring sources to perform unnecessary cumulative analyses under these conditions consumes valuable state resources and places an undue burden on the permitting source.

WESTAR recommends that EPA propose a higher 1-hour NO_2 SIL that is less sensitive to hourly predictions, or if possible, propose another methodology to determine the necessity of a cumulative analysis when modeling for the new 1-hour NO_2 NAAQS.

In the meantime, until the 1-hour NO_2 SIL is finalized, WESTAR's member agencies will, at the states discretion, usehigher interim SIL values, or other methodologies for determining the need for a cumulative NAAQS analysis. The SIL value or methodology chosen to determine the necessity for a cumulative analysis will be left to the individual member-agency.

MODEL ACCURACY

EPA has limited field data to test the accuracy of AERMOD's NO_2 algorithms. A field study developed around a relatively isolated source could partially provide the data needed to advance refined NO_2 modeling techniques. The objective would be to compare the estimates from a variety of NO_2 modeling techniques to actual ambient NO_2 concentrations.

WESTAR believes that field studies are critically needed to help resolve some of the 1-hour NO_2 modeling concerns, and that these field studies are EPA'sresponsibility. If EPA is unwilling to accept the responsibilities associated with the field studies, WESTAR requests that EPA provide technical and financial assistance to support the studies needed to improve NO_2 modeling techniques.

If you have any questions or require further clarification on our comments, please contact WESTAR Executive Director Dan Johnson at 206-254-9145 or djohnson@westar.org.

Sincerely,

Greg Remer, President
Western States Air Resources Council

WESTAR 1-HOUR NO_2 MODELING AD HOC COMMITTEE

BACKGROUND INFORMATION:

Computer models are imperfect attempts to estimate an existing or future air quality impact from a given emissions activity. The refined models promulgated by EPA, such as AERMOD, have been shown to not be biased towards *underestimating* air quality impacts, but according to EPA's *Guideline on Air Quality Models* (Guideline) "errors in the highest estimated concentrations of ± 10 to 40 percent are typical." The Guideline further states, "models are also more reliable for estimating longer time-averaged concentrations than for estimating short-term concentrations at specific locations." This is likely due to the averaging of both over- and under-estimates that occurs with a longer period.

Accurately modeling 1-hour impacts is therefore more challenging than modeling impacts over longer averaging periods. The current techniques for estimating the amount of atmospheric conversion of oxide of nitrogen (NOx) into nitrogen dioxide (NO_2) may also be conservative, especially in the nearfield. This apparent tendency to overestimate 1-hour NO_2 impacts, coupled with an *extremely stringent* 1-hour NO_2 standard, leads to hurdles that are proving difficult to overcome. Some of these difficulties are further described in this report.

To demonstrate compliance with EPA's new 1-Hour NO_2 NAAQS air quality dispersion modeling analysis must be performed which shows that emissions from a source will not cause or contribute to a violation of the standard.

Initial performance of air quality dispersion modeling for the 1-hour standard has found that demonstrating compliance with the new standard is challenging, and can result in significant delays and hurdles in the permitting process and in granting approvals.

The 1-hour NO_2 standard is more stringent than the previous NAAQS, and as such the margin for error is smaller than it has been in the past, and when combined with the conservatism to modeling guidelines it is possible that modeled concentrations exceed the standard when monitoring indicates compliance with the standard. Such results can lead to uncertainty and unnecessary commitment of scare state resources to solve nonexistent issues.

EPA is aware of the difficulties surrounding these complex issues and has attempted to address the problems by issuing guidance memorandums (dated June 29, 2010 and March 1, 2011) to provide further clarification and guidance on the application of Appendix W guidance for the 1-hour NO_2 standard.

Nevertheless, WESTAR's Air Directors asked WESTAR staff to form an ad hoc committee to review the modeling requirements in order to identify the issues causing the difficulties and to determine possible solutions because without a better understanding of these issues the challenges of demonstrating compliance will continue.

In response, a 1-hour NO_2 Modeling ad hoc committee was convened. The committee consisting of Phil Allen (Oregon DEQ), Clint Bowman (Washington Department of Ecology), Cyra Cain (Montana DEQ), Tom Orth (Utah DEQ), Alan Schuler (Alaska DEC), and Jeff Gabler (WESTAR). Conference calls were conducted to discuss issues. Guest speakers included EPA staff and state staff.

The committee has attempted to provide the best recommendations possible. However, there is no quick and optimal solution for improving model accuracy or substantively streamlining the process. Accuracy and streamlining also tend to have opposite effects. Streamlining typically leads to "short-cuts" at the cost of accuracy. Improving accuracy typically requires more detailed information (which takes time to collect) and typically requires longer processing times. Therefore, the general modeling difficulties associated with the 1-hour NO_2 standard will likely be around for a while.

Following are the salient issues as identified by the committee are:

- Temporary/Portable/Intermittent/Seasonal
- In-Stack Ratios
- Significant Impact Level (SIL)
- Background Ambient Ozone Concentrations

TEMPORARY/PORTABLE/INTERMITTENT/SEASONAL:

The promulgation of the 1-Hour NO_2 standard has focused attention on the issue of intermittent versus continuously operating emission units. When demonstrating compliance with the annual standard, intermittent emissions were generally not considered significant contributions to total emissions, and an annual operating limit, such as 500 hours/year, could be included as a permit condition for many intermittent sources. As a result, modeled impacts from intermittent sources were not in general significant when compared to the annual standard. However, when intermittent emissions, for example from emergency generators or startup-shutdown operations, are modeled for compliance with the 1-Hour standard, the modeled concentrations can be high, and in many case can be significantly higher than what might be "realistically expected," in EPA's language. This is because the intermittent hourly emission rate is treated as continuous over multiple years in order to calculate the design value, which is the 98th percentile, averaged over three years.

In order to clarify earlier guidance to show compliance with the 1-hr NO_2 standard, EPA issued additional guidance in a March 1, 2011 memorandum that specifically addressed the question of intermittent emissions. In part, the guidance stated that certain types of intermittent sources could be excluded from the 1-hr compliance demonstration. As a result, unrealistically high modeled impacts from some intermittent sources could be avoided.

This raises the issue of the criteria to distinguish an intermittent source from one that is considered to operate continuously. The guidance states that a source is considered to operate continuously when its emissions "contribute significantly to the annual distribution of daily maximum 1-hour concentrations." The guidance gave as an example a large, baseload power generator that operates continuously with relatively infrequent start up and shut downs. This is compared to a peaking unit that may go through frequent startup/shutdown cycles over the course of a week, or even of a day. In this case the guidance would exclude the startup-shutdown emissions from the base load plant, but not from the peaker unit.

In the guidance, EPA states "that case-specific issues and factors may arise that affect the application of this guidance," and that not all facilities will fit within a "clearly defined continuous/normal operations vs. intermittent/infrequent emissions" scenario, such as that between baseload and peaker operations described above. However, it is not clear all the factors that a state regulatory agency might consider in determining intermittent from continuous facilities and their emissions.

It is recommended that this workgroup work request that EPA develop more detailed criteria, with examples, of operations that could reasonably fall within the scope of this guidance and be excluded as intermittent sources from demonstrating compliance with the 1-hr NO_2 standard.

ONE-HOUR NO_2 MODELING AND THE NOX/NO_2 IN-STACK RATIO:

The AERMOD Model includes two non-regulatory options for refining modeled NO_2 impacts. These options are known as the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM). Both options use a two part process to estimate the NO_2 component of a NO_x impact. The first part requires the user to provide the assumed NO_2/NOx in-stack ratio for each source, which is defined as the fraction of NOx gas that is thermally converted to NO_2 prior to its release from a stack or point source. The second part uses available O_3 information and methodologies to estimate the portion of the remaining NO_x that will mix with available O_3 and be converted to NO_2 during transport.

Prior to the new 1-hour NO_2 NAAQS, a commonly used in-stack ratio for purposes of modeling the annual average NO_2 impact was 0.10. The EPA's most current guidance for 1-hour modeling proposes to use an in-stack ratio of 50% conversion of NOx to NO_2 in the stack. The limited amount of measured NO_2/NO_x ratio data currently available suggests that most industrial processes have a NO_2/NOx ratio of between 0 and 30%.

Permitted sources are periodically required to conduct stack test, either for initial testing or compliance tests. Larger sources are also typically required to install and operate Continuous Emissions Monitors (CEMs) to instantaneously monitor the portion of NO_x in the gas stream. Current NOx stack testing equipment is capable to differentiating NO_2 from NOx in the gas stream, however minor adjustments must be made to the equipment in able to extract the NO2/NOx in-stack ratio. CEMs are capable of measuring a NO_2/NOx in-stack ratio if the equipment were programmed to report this value.

The NO_2/NOx in-stack ratio is critical since it defines the portion of the model predicted NOx concentration that will be automatically converted to NO_2. The remaining portion released into the air may or may not undergo conversion to NO_2 prior to it reaching a receptor point. In the case of lower-level releases, the transport distance may be a few hundred meters or less. In this case, the predicted concentration would be in-stack ratio dependent with minimal NO_2 formation due to reactions with O_3. Hence, the user's choice of an in-stack ratio could be the determining factor in model predictions.

The group did not attempt to identify suitable in-stack ratios for modeling 1-hour NO2. Rather, it was the group's conclusion that these ratios should be derived from measurements taken during stack testing of permitted in-place equipment operating under normal conditions

Therefore, it is the recommendation of this workgroup that the State agencies explore enhancements to their compliance testing and CEM programs that would allow the instruments to report the in-stack ratio. This information could then be compiled in a national database to assist EPA in proposing more representative NO_2/NOx in-stack ratios. This information could be used to identify default ratios that are process based, or it may provide support for a lower 1-hour NO_2/NOx in-stack default ratio.

SIGNIFICANT IMPACT LEVEL (SIL):

The significant impact level (SIL) is the threshold used to determine when a modeled impact may be considered de minimis in a regulatory modeling analysis. Modeled impacts above this threshold are considered large enough to "cause or contribute" to a modeled violation of an air quality standard or increment. Modeled impacts below this threshold are considered insignificant.

The SIL allows new source review (NSR) applicants to conduct the relatively simpler "project impact" assessment if they believe their project impacts to be de minimis. If not, they then have to conduct the more complex "cumulative impact analysis," where "nearby" sources must also be included in their modeling analysis.

EPA has previously codified the SILs for each criteria pollutant (except ozone), so that the SILs may be used in regulatory assessments. EPA intends to promulgate a SIL for the 1-hour NO_2 standard, but in the mean-time has issued a "recommended interim" value "that states may consider" when carrying out their new source review modeling assessments.

EPA stated that the interim value "does not bind state and local governments and the public as a matter of law." EPA also acknowledged that several states have adopted interim 1-hour NO_2 SILs that differ (both higher and lower) from their recommended value, and that the EPA-recommended value "is not intended to supersede any interim SIL that is now or may be relied upon to implement a state PSD program that is part of an approved SIP, or to impose the use of the SIL concept on any state that chooses to implement the PSD program."

EPA's interim value is 4 parts per billion (8 micrograms per cubic meter). Prior to EPA's recommendation, the Northeast States for Coordinated Air Use Management (NESCAUM) recommended a value of 10 micrograms per cubic meter ($\mu g/m^3$). The 1-hour NO_2 standard is 188 $\mu g/m^3$.

Modeling staff in some states consider EPA's interim value as the "expected value" that they should use, in spite of EPA's comments. They also question the reasonableness of the interim value. They feel that the value is so small that it has become effectively moot – i.e., most new PSD project impacts would likely be considered significant. PSD sources with taller stacks may model under the SIL if the emissions are just above the significant emissions rate trigger, but the modeled impacts for sources with larger or lower-level releases would likely exceed the SIL. Minor sources, which typically release their pollutants at lower levels and typically have short transport distances to ambient air, would likely always exceed the interim SIL. If true, then all NSR applicants, including minor source applicants, will be required to conduct cumulative impact analysis.

In summary, the 1-hour NO_2 standard is extremely stringent and the 1-hour modeling techniques tend to be conservative (for the reasons described in the Additional Background section of this report). Therefore, a larger SIL may be needed to provide relief from the "false positives" that will likely come from the current NO_2 modeling techniques.

The committee request that WESTAR seek EPA confirmation that they are willing to accept higher interim values, or even alternative approaches (such as a population-dependent range of values), in state NSR programs. The committee wants to uphold the new standard, but fears the current modeling techniques can be overly conservative. Allowing states to use higher SILs would therefore allow them to cull smaller projects out of the cumulative impact requirement, without jeopardizing air quality. The committee further request that EPA consider higher SILs in their pending rulemaking.

BACKGROUND AMBIENT OZONE CONCENTRATIONS:

Background ambient ozone (O_3) concentrations are required for the applications of the OLM and PVMRM options in AERMOD.

Ozone concentrations can be entered into the model as a single (most conservative) or hourly values covering an entire year (modeling requires five years of data).

Current Sources of Ambient Background Ozone Data:

- Clean Air Status and Trends Network (CASTNET): Hourly; 80 sites in U.S. (including Alaska) and Canada in remote areas
- USEPA AirData: 1-hour values (first, second, third, and fourth highest); in most cases, monitoring occurs in high population areas

The committee recommends that WESTAR establish a database of all rural hourly ozone concentrations, and corresponding NO_2 and NOx values from participating states. Additional monitoring may be required through WESTAR financial assistance.

Background concentrations could be obtained through a fusion (as available in BenMAP) of observations and modeling. Modeling domain could cover the entire western state region with incorporation and validation of monitored values. Once established, modeling could be expanded to include other pollutants and interstate transport. Committee is willing to provide recommendations and additional details upon request.

OTHER ISSUE:

EPA has inadequate field data to promulgate PVMRM/OLM modeling options as approved techniques for modeling 1-hour NO_2 impacts. Therefore, the use of these techniques must be approved by EPA on a case-by-case basis, which takes time and delays permit actions. There is also concern that the techniques are overly conservative; however, they can't be refined without additional data.

A field study developed around a relatively isolated source could provide some of the data needed to advance refined NO_2 modeling techniques. The objective would be to compare the estimates from a variety of NO_2 modeling techniques to actual ambient NO_2 concentrations.

The committee did not develop a cost estimate. It would not be cheap since a number of source and ambient air parameters would need to be measured and processed. The study would also take time to develop and conduct. EPA would need to be included in the study design.

Since the concerns are national, there may be merit in sharing the cost with other groups, if not in expanding the study to include a variety of sources. However, the committee cannot explore this option without Director support. The committee stands ready though to provide additional details as to what this type of study would entail.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	500 gal glycol	
City:		
State:		
Company:		
Type of Tank:	Horizontal Tank	
Description:		

Tank Dimensions

Shell Length (ft):		6.00
Diameter (ft):		4.00
Volume (gallons):		500.00
Turnovers:		0.00
Net Throughput(gal/yr):		2,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light	
Shell Condition	Good	

Breather Vent Settings

Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

500 gal glycol - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	59.41	49.72	69.11	54.20	0.0009	0.0005	0.0015	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

500 gal glycol - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.0153
Vapor Space Volume (cu ft):	48.0243
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0700
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	48.0243
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.5293
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0009
Daily Avg. Liquid Surface Temp. (deg. R):	519.0816
Daily Average Ambient Temp. (deg. F):	51.9625
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	513.8725
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,452.1184
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0700
Daily Vapor Temperature Range (deg. R):	38.7740
Daily Vapor Pressure Range (psia):	0.0010
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0009
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0005
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0015
Daily Avg. Liquid Surface Temp. (deg R):	519.0816
Daily Min. Liquid Surface Temp. (deg R):	509.3881
Daily Max. Liquid Surface Temp. (deg R):	528.7751
Daily Ambient Temp. Range (deg. R):	23.3583
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0009
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	0.0033
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0009
Annual Net Throughput (gal/yr.):	2,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000

Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0186

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

500 gal glycol - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.00	0.02	0.02

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	525 gal Methanol Tank	
City:		
State:		
Company:		
Type of Tank:	Horizontal Tank	
Description:		
Tank Dimensions		
Shell Length (ft):		6.00
Diameter (ft):		4.00
Volume (gallons):		525.00
Turnovers:		3.81
Net Throughput(gal/yr):		2,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Red/Primer	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

525 gal Methanol Tank - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	Jan	48.12	41.20	55.04	56.30	0.9818	0.7769	1.2315	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Feb	53.02	43.85	62.19	56.30	1.1534	0.8506	1.5445	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Mar	59.08	47.22	70.94	56.30	1.4010	0.9528	2.0187	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Oct	63.16	51.19	75.13	56.30	1.5920	1.0866	2.2861	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Nov	54.50	46.49	62.50	56.30	1.2099	0.9297	1.5596	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl alcohol	Dec	48.35	42.11	54.58	56.30	0.9891	0.8015	1.2133	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

525 gal Methanol Tank - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.6879	1.0197	1.8912							2.2545	1.0059	0.6211
Vapor Space Volume (cu ft):	48.0243	48.0243	48.0243							48.0243	48.0243	48.0243
Vapor Density (lb/cu ft):	0.0058	0.0067	0.0081							0.0091	0.0070	0.0058
Vapor Space Expansion Factor:	0.0884	0.1267	0.1809							0.1947	0.1121	0.0793
Vented Vapor Saturation Factor:	0.9057	0.8911	0.8707							0.8556	0.8863	0.9051
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	48.0243	48.0243	48.0243							48.0243	48.0243	48.0243
Tank Diameter (ft):	4.0000	4.0000	4.0000							4.0000	4.0000	4.0000
Effective Diameter (ft):	5.5293	5.5293	5.5293							5.5293	5.5293	5.5293
Vapor Space Outage (ft):	2.0000	2.0000	2.0000							2.0000	2.0000	2.0000
Tank Shell Length (ft):	6.0000	6.0000	6.0000							6.0000	6.0000	6.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0058	0.0067	0.0081							0.0091	0.0070	0.0058
Vapor Molecular Weight (lb/lb-mole):	32.0400	32.0400	32.0400							32.0400	32.0400	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9818	1.1534	1.4010							1.5920	1.2099	0.9891
Daily Avg. Liquid Surface Temp. (deg. R):	507.7922	512.6903	518.7530							522.8324	514.1658	508.0150
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000							53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731							10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	515.9725	515.9725	515.9725							515.9725	515.9725	515.9725
Tank Paint Solar Absorptance (Shell):	0.8900	0.8900	0.8900							0.8900	0.8900	0.8900
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279							1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0884	0.1267	0.1809							0.1947	0.1121	0.0793
Daily Vapor Temperature Range (deg. R):	27.6899	36.6717	47.4475							47.8778	32.0225	24.9467
Daily Vapor Pressure Range (psia):	0.4546	0.6939	1.0660							1.1995	0.6299	0.4118
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600							0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9818	1.1534	1.4010							1.5920	1.2099	0.9891
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.7769	0.8506	0.9528							1.0866	0.9297	0.8015
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.2315	1.5445	2.0187							2.2861	1.5596	1.2133
Daily Avg. Liquid Surface Temp. (deg R):	507.7922	512.6903	518.7530							522.8324	514.1658	508.0150
Daily Min. Liquid Surface Temp. (deg R):	500.8697	503.5224	506.8911							510.8629	506.1602	501.7783
Daily Max. Liquid Surface Temp. (deg R):	514.7146	521.8583	530.6149							534.8019	522.1714	514.2517
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000							25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9057	0.8911	0.8707							0.8556	0.8863	0.9051
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.9818	1.1534	1.4010							1.5920	1.2099	0.9891
Vapor Space Outage (ft):	2.0000	2.0000	2.0000							2.0000	2.0000	2.0000
Working Losses (lb):	0.1248	0.1467	0.1781							0.2024	0.1538	0.1258
Vapor Molecular Weight (lb/lb-mole):	32.0400	32.0400	32.0400							32.0400	32.0400	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9818	1.1534	1.4010							1.5920	1.2099	0.9891
Net Throughput (gal/mo.):	166.6667	166.6667	166.6667							166.6667	166.6667	166.6667
Annual Turnovers:	3.8095	3.8095	3.8095							3.8095	3.8095	3.8095
Turnover Factor:	1.0000	1.0000	1.0000							1.0000	1.0000	1.0000

Tank Diameter (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	0.8127	1.1664	2.0694	2.4570	1.1598	0.7469

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, October, November, December

525 gal Methanol Tank - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	0.93	7.48	8.41

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: QEP - [redacted]
File Name: U:\EHS\ 07 UTAH\Uinta Basin - QEP FS\ [redacted]
FS\Miscellaneous\Dehy analysis for Mark Peak\[redacted]1 MMscfd TEG Dehy.ddf
Date: January 22, 2014

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0114	0.273	0.0498
Ethane	0.0089	0.214	0.0390
Propane	0.0131	0.314	0.0572
Isobutane	0.0052	0.124	0.0227
n-Butane	0.0090	0.216	0.0395
Isopentane	0.0034	0.081	0.0148
n-Pentane	0.0035	0.084	0.0154
n-Hexane	0.0019	0.045	0.0082
Cyclohexane	0.0049	0.118	0.0215
Other Hexanes	0.0027	0.065	0.0118
Heptanes	0.0020	0.047	0.0086
Methylcyclohexane	0.0047	0.112	0.0204
2,2,4-Trimethylpentane	0.0001	0.002	0.0003
Benzene	0.0121	0.291	0.0531
Toluene	0.0073	0.175	0.0320
Ethylbenzene	0.0001	0.002	0.0003
Xylenes	0.0007	0.017	0.0031
C8+ Heavies	<0.0001	<0.001	0.0001
Total Emissions	0.0908	2.180	0.3978
Total Hydrocarbon Emissions	0.0908	2.180	0.3978
Total VOC Emissions	0.0705	1.693	0.3089
Total HAP Emissions	0.0222	0.532	0.0970
Total BTEX Emissions	0.0202	0.485	0.0885

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2281	5.475	0.9993
Ethane	0.1810	4.343	0.7926
Propane	0.2824	6.778	1.2370
Isobutane	0.1215	2.916	0.5322
n-Butane	0.2261	5.427	0.9904
Isopentane	0.1164	2.795	0.5100
n-Pentane	0.1206	2.894	0.5282
n-Hexane	0.1194	2.866	0.5231
Cyclohexane	0.4055	9.733	1.7763
Other Hexanes	0.1345	3.229	0.5893
Heptanes	0.2889	6.934	1.2655
Methylcyclohexane	0.7028	16.866	3.0781
2,2,4-Trimethylpentane	0.0110	0.265	0.0483
Benzene	1.1026	26.462	4.8293
Toluene	1.7875	42.900	7.8293
Ethylbenzene	0.0633	1.518	0.2770
Xylenes	0.6698	16.076	2.9338
C8+ Heavies	0.8601	20.642	3.7671

Total Emissions	7.4216	178.119	32.5068
Total Hydrocarbon Emissions	7.4216	178.119	32.5068
Total VOC Emissions	7.0125	168.301	30.7149
Total HAP Emissions	3.7536	90.087	16.4408
Total BTEX Emissions	3.6232	86.956	15.8695

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1111	2.666	0.4865
Ethane	0.0276	0.663	0.1209
Propane	0.0223	0.535	0.0977
Isobutane	0.0069	0.165	0.0301
n-Butane	0.0101	0.243	0.0444
Isopentane	0.0048	0.115	0.0210
n-Pentane	0.0041	0.099	0.0180
n-Hexane	0.0024	0.059	0.0107
Cyclohexane	0.0021	0.050	0.0090
Other Hexanes	0.0035	0.085	0.0154
Heptanes	0.0031	0.075	0.0138
Methylcyclohexane	0.0030	0.072	0.0131
2,2,4-Trimethylpentane	0.0002	0.005	0.0010
Benzene	0.0010	0.024	0.0043
Toluene	0.0011	0.027	0.0049
Ethylbenzene	<0.0001	0.001	0.0001
Xylenes	0.0002	0.005	0.0008
C8+ Heavies	0.0026	0.062	0.0113
Total Emissions	0.2062	4.948	0.9029
Total Hydrocarbon Emissions	0.2062	4.948	0.9029
Total VOC Emissions	0.0675	1.619	0.2955
Total HAP Emissions	0.0050	0.120	0.0218
Total BTEX Emissions	0.0023	0.055	0.0101

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	2.2213	53.311	9.7292
Ethane	0.5522	13.254	2.4188
Propane	0.4459	10.702	1.9532
Isobutane	0.1373	3.296	0.6015
n-Butane	0.2026	4.863	0.8875
Isopentane	0.0958	2.298	0.4194
n-Pentane	0.0822	1.974	0.3602
n-Hexane	0.0490	1.175	0.2144
Cyclohexane	0.0413	0.992	0.1810
Other Hexanes	0.0704	1.691	0.3086
Heptanes	0.0629	1.509	0.2754
Methylcyclohexane	0.0597	1.432	0.2613
2,2,4-Trimethylpentane	0.0045	0.109	0.0198
Benzene	0.0197	0.473	0.0862
Toluene	0.0222	0.532	0.0971
Ethylbenzene	0.0005	0.012	0.0021
Xylenes	0.0038	0.090	0.0165
C8+ Heavies	0.0517	1.242	0.2266

Total Emissions	4.1230	98.953	18.0589
Total Hydrocarbon Emissions	4.1230	98.953	18.0589
Total VOC Emissions	1.3495	32.389	5.9109
Total HAP Emissions	0.0996	2.390	0.4362
Total BTEX Emissions	0.0461	1.107	0.2020

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1224	2.939	0.5363
Ethane	0.0365	0.877	0.1600
Propane	0.0354	0.849	0.1549
Isobutane	0.0121	0.289	0.0528
n-Butane	0.0191	0.459	0.0838
Isopentane	0.0082	0.196	0.0358
n-Pentane	0.0076	0.183	0.0334
n-Hexane	0.0043	0.104	0.0189
Cyclohexane	0.0070	0.167	0.0305
Other Hexanes	0.0062	0.149	0.0272
Heptanes	0.0051	0.122	0.0223
Methylcyclohexane	0.0076	0.183	0.0334
2,2,4-Trimethylpentane	0.0003	0.007	0.0013
Benzene	0.0131	0.314	0.0574
Toluene	0.0084	0.202	0.0368
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0009	0.022	0.0039
C8+ Heavies	0.0026	0.063	0.0114
Total Emissions	0.2970	7.127	1.3007
Total Hydrocarbon Emissions	0.2970	7.127	1.3007
Total VOC Emissions	0.1380	3.312	0.6045
Total HAP Emissions	0.0271	0.651	0.1188
Total BTEX Emissions	0.0225	0.540	0.0986

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: QEP [redacted]
File Name: U:\EHS\ 07 UTAH\Uinta Basin - QEP FS\ [redacted]
FS\Miscellaneous\Dehy analysis for Mark Peak\[redacted]MMscfd TEG Dehy.ddf
Date: January 22, 2014

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0114	0.274	0.0501
Ethane	0.0090	0.217	0.0395
Propane	0.0132	0.318	0.0580
Isobutane	0.0053	0.128	0.0234
n-Butane	0.0094	0.225	0.0411
Isopentane	0.0037	0.089	0.0163
n-Pentane	0.0038	0.092	0.0168
n-Hexane	0.0022	0.052	0.0096
Cyclohexane	0.0057	0.137	0.0249
Other Hexanes	0.0031	0.074	0.0135
Heptanes	0.0024	0.057	0.0105
Methylcyclohexane	0.0056	0.134	0.0245
2,2,4-Trimethylpentane	0.0001	0.002	0.0004
Benzene	0.0114	0.275	0.0501
Toluene	0.0066	0.159	0.0290
Ethylbenzene	0.0001	0.002	0.0003
Xylenes	0.0006	0.014	0.0026
C8+ Heavies	<0.0001	0.001	0.0001
Total Emissions	0.0937	2.249	0.4105
Total Hydrocarbon Emissions	0.0937	2.249	0.4105
Total VOC Emissions	0.0733	1.758	0.3209
Total HAP Emissions	0.0210	0.504	0.0919
Total BTEX Emissions	0.0187	0.449	0.0820

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2291	5.498	1.0033
Ethane	0.1828	4.387	0.8006
Propane	0.2815	6.756	1.2330
Isobutane	0.1214	2.913	0.5316
n-Butane	0.2256	5.414	0.9880
Isopentane	0.1161	2.786	0.5084
n-Pentane	0.1205	2.892	0.5278
n-Hexane	0.1192	2.860	0.5220
Cyclohexane	0.3941	9.458	1.7261
Other Hexanes	0.1344	3.226	0.5888
Heptanes	0.2872	6.893	1.2579
Methylcyclohexane	0.6814	16.353	2.9844
2,2,4-Trimethylpentane	0.0110	0.265	0.0484
Benzene	0.8300	19.919	3.6352
Toluene	1.2497	29.993	5.4737
Ethylbenzene	0.0420	1.009	0.1841
Xylenes	0.4169	10.006	1.8261
C8+ Heavies	0.8255	19.811	3.6155

	lbs/hr	lbs/day	tons/yr
Total Emissions	6.2682	150.438	27.4549
Total Hydrocarbon Emissions	6.2682	150.438	27.4549
Total VOC Emissions	5.8564	140.553	25.6510
Total HAP Emissions	2.6688	64.051	11.6893
Total BTEX Emissions	2.5386	60.926	11.1190

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1110	2.665	0.4864
Ethane	0.0276	0.663	0.1210
Propane	0.0223	0.534	0.0975
Isobutane	0.0069	0.164	0.0300
n-Butane	0.0101	0.242	0.0442
Isopentane	0.0048	0.115	0.0209
n-Pentane	0.0041	0.098	0.0180
n-Hexane	0.0024	0.058	0.0107
Cyclohexane	0.0020	0.048	0.0087
Other Hexanes	0.0035	0.084	0.0154
Heptanes	0.0031	0.074	0.0136
Methylcyclohexane	0.0029	0.068	0.0125
2,2,4-Trimethylpentane	0.0002	0.005	0.0010
Benzene	0.0007	0.018	0.0032
Toluene	0.0008	0.018	0.0034
Ethylbenzene	<0.0001	<0.001	0.0001
Xylenes	0.0001	0.003	0.0005
C8+ Heavies	0.0024	0.059	0.0107
Total Emissions	0.2050	4.919	0.8977
Total Hydrocarbon Emissions	0.2050	4.919	0.8977
Total VOC Emissions	0.0663	1.591	0.2903
Total HAP Emissions	0.0043	0.103	0.0188
Total BTEX Emissions	0.0016	0.039	0.0072

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	2.2210	53.304	9.7279
Ethane	0.5526	13.263	2.4205
Propane	0.4451	10.683	1.9496
Isobutane	0.1371	3.290	0.6003
n-Butane	0.2021	4.849	0.8850
Isopentane	0.0955	2.292	0.4184
n-Pentane	0.0820	1.968	0.3591
n-Hexane	0.0486	1.167	0.2130
Cyclohexane	0.0396	0.951	0.1736
Other Hexanes	0.0701	1.682	0.3070
Heptanes	0.0620	1.487	0.2714
Methylcyclohexane	0.0571	1.370	0.2499
2,2,4-Trimethylpentane	0.0045	0.108	0.0197
Benzene	0.0148	0.354	0.0646
Toluene	0.0154	0.370	0.0675
Ethylbenzene	0.0003	0.008	0.0014
Xylenes	0.0023	0.056	0.0102
C8+ Heavies	0.0490	1.176	0.2146

Total Emissions	4.0990	98.377	17.9538
Total Hydrocarbon Emissions	4.0990	98.377	17.9538
Total VOC Emissions	1.3254	31.810	5.8054
Total HAP Emissions	0.0859	2.063	0.3764
Total BTEX Emissions	0.0328	0.787	0.1437

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1225	2.939	0.5365
Ethane	0.0367	0.880	0.1606
Propane	0.0355	0.852	0.1554
Isobutane	0.0122	0.293	0.0534
n-Butane	0.0195	0.468	0.0854
Isopentane	0.0085	0.204	0.0372
n-Pentane	0.0079	0.190	0.0347
n-Hexane	0.0046	0.111	0.0202
Cyclohexane	0.0077	0.184	0.0336
Other Hexanes	0.0066	0.158	0.0288
Heptanes	0.0055	0.132	0.0241
Methylcyclohexane	0.0084	0.202	0.0370
2,2,4-Trimethylpentane	0.0003	0.008	0.0014
Benzene	0.0122	0.292	0.0534
Toluene	0.0074	0.177	0.0323
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0007	0.017	0.0031
C8+ Heavies	0.0025	0.059	0.0108
Total Emissions	0.2987	7.168	1.3082
Total Hydrocarbon Emissions	0.2987	7.168	1.3082
Total VOC Emissions	0.1395	3.349	0.6112
Total HAP Emissions	0.0253	0.607	0.1108
Total BTEX Emissions	0.0204	0.489	0.0892

II.B.1.c The following definitions shall apply to this Section II.B.1.c:

"Approved Instrument Monitoring Method," or "AIMM" as used in this GAO means an infra-red camera, tunable diode laser absorption spectroscopy, Method 21, or other Department approved instrument monitoring, device or method.

"Component" means each pump seal, compressor seal, flange, pressure relief device, Connector, open ended line, and valve greater than ¼" in diameter that contains or contacts a process stream with at least 10 percent VOC by weight. Process streams consisting of glycol, amine, produced water, or methanol are not components for purposes of this GAO.

"Connector" means flanged, screwed, or other joined fittings used to connect two pipes or a pipe and a piece of process equipment or that close an opening in a pipe that could be connected to another pipe. Jointed fittings welded completely around the circumference of the interface are not considered connectors.

"Difficult to monitor Equipment or Components" are those that cannot be monitored without elevating the monitoring personnel more than six (6) feet above a supported surface or are unable to be reached via a wheeled scissor-lift or hydraulic type scaffold that allows access to components up to twenty-five (25) feet above the ground.

"Inaccessible to monitor Equipment or Components" are those that are buried, insulated, or obstructed by equipment or piping that prevents access to the Components.

"Unsafe to monitor Equipment or Components" are those that are unsafe to inspect because inspecting personnel would be exposed to imminent or potential danger as a consequence of completing the monitoring.

II.B.1.c.1 Owners and/or operators of new facilities authorized by this GAO shall inspect Components for leaks using an AIMM as soon as practicable, but no later than 180 days after the date when the first liquid travels through the permanent equipment, except as provided in Section II.B.1.c.2. After this initial inspection, AIMM will be performed at the frequencies identified in Table 1, except as provided below.

Emissions during routine maintenance, tank gauging, and loadout operations shall not be included in the AIMM program.

If, upon the completion of four consecutive quarterly AIMM monitoring events, no leaks are detected, AIMM monitoring shall be conducted semi-annually. If, upon the completion of two consecutive semi-annual AIMM monitoring events, no leaks are detected, AIMM monitoring shall be conducted annually. If two or more leaks are detected during subsequent monitoring events, the monitoring frequency shall revert back to the original frequency prescribed in this GAO.

For the purposes of this Section II.B.1.c, the VOC thresholds shall be calculated using the estimated uncontrolled actual emissions from storage tanks located at the facility. If no storage tanks are located at the facility, VOC thresholds shall be calculated using the potential to emit of VOC for all of the emissions sources, including fugitive emissions from Components located at the facility.

TABLE 1

Uncontrolled Storage Tank VOC Emissions	AIMM Inspection Frequency (calendar basis)
> 5 and ≤ 10	One time
> 10 and ≤ 20	Annually
> 20 and ≤ 50	Semi-Annual
> 50	Quarterly
Facilities without storage tanks that have a PTE > 20 tpy VOC	Semi-Annual

II.B.1.c.2 If a Component or equipment is difficult, unsafe, or inaccessible to monitor, the owner or operator shall not be required to monitor.

II.B.1.c.3 For Method 21 or other quantitative AIMMs, a Leak is any concentration of VOCs above 10,000 ppm.

For qualitative AIMM monitoring, a Leak is any detectable hydrocarbon emissions.

For Leaks identified using qualitative AIMM, owners and operators have the option of either repairing the leak in accordance with the repair schedule set forth in Section II.B.1.c.4 or conducting follow-up monitoring using Method 21 within fifteen (15) working days of the day the leak was detected. If the follow-up Method 21 monitoring shows that the leak concentration is less than or equal to 10,000 ppm VOCs, then the emission shall not be considered a Leak for purposes of this Section II.B.1.c.

If a leak is identified using AIMM and the leak is immediately repaired (within the same working day), any such leak does not constitute a leak and is not subject to II.B.1.c.4. or II.B.1.c.5.

II.B.1.c.4 First attempt to repair a leak that requires repair pursuant to II.B.1.c shall be made no later than fifteen (15) working days after determination that the leak requires repair, unless parts are unavailable, the equipment requires shutdown to complete repair, or other good cause exists. If parts are unavailable, they shall be ordered promptly and the repair shall be made within thirty (30) working days of receipt of the parts. If shutdown is required, the leak shall be repaired during the next scheduled shutdown. If delay is attributable to other good cause, repairs shall be completed within thirty (30) working days after the owner or operator has reason to believe the cause of delay ceases to exist.

Within thirty (30) working days of completion of a repair, leaks that are repaired shall be re-monitored utilizing AIMM to verify the repair was effective.

Leaks discovered pursuant to the leak detection methods of Section II.B.1.c shall not be a violation or subject to enforcement by the Department unless the owner or operator fails to perform the required repairs in accordance with Section II.B.1.c.4.

II.B.1.c.5 Records of infrared camera inspections and leak detection and repair shall be maintained for two (2) years and shall include the following:

a. the date of the inspection,

b. the name of the person conducting the inspection,

c. the identification of any component that was determined to be leaking,

d. the delayed repair list including the basis for placing leaks on the list,

e. a list of Components that are designated as unsafe, difficult or inaccessible to monitor, as described in Section XYZ., and an explanation for each Component stating why the Component is so designated,

d. the analyzer's reading (if analyzer is utilized),

e. corrective action taken,

f. the date corrective action was completed,

g. the date the repair was verified.

LDAR
DAQ is willing to add more detail to the LDAR requirements.

8. What components are unsafe to monitor with an infrared camera at a tank battery? Please provide documentation/justification with this.

As drafted the LDAR provisions of the GAO are not limit to tank batteries – they would include meter skids, separators, heater treaters, engines, compressors, vapor combustors, flares, dehys, pneumatic pumps, controllers, wellheads, and any other type of equipment located at a facility. Monitoring components that could expose personnel to falls from height, rotating equipment, heat, and other sources of uncontrolled energy are typically those that are identified as unsafe to monitor. While a camera may be used at some distance from a component, a vapor analyzer cannot and we'd expect that Method 21 would be an acceptable alternative to use of a camera for smaller operators. Additionally, repair of such components could be unsafe as well.

NSPS Subpart OOOO allows for a delay of repair if requiring a shutdown, but not for parts availability. It appears that delay is allowed if the emissions from the shutdown would be greater than the fugitive emissions.

Discussion: NSPS Subpart OOOO does provide, by reference, for delay of repair of leaking valves when supplies have been depleted. The leak detection provisions of NSPS Subpart OOOO, which only apply to natural gas processing facilities, simply reference other portions of the New Source Performance Standards, more specifically NSPS Subpart VV found in 40 CFR 60.480 through 60.489:

40 CFR §60.5400 What Equipment Leak Standards Apply To Affected Facilities At An Onshore Natural Gas Processing Plant?

This section applies to the group of all equipment, except compressors, within a process unit.

(a) You must comply with the requirements of §§60.482-1a(a), (b), and (d), 60.482-2a, and 60.482-4a through 60.482-11a, except as provided in §60.5401.

40 CFR 60.482-9(e) states:

(e) Delay of repair beyond a process unit shutdown will be allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.

Furthermore, NSPS Subpart OOOO and NSPS Subpart KKK are intended for natural gas processing plants, large manned processing facilities where it is expected and common that a parts warehouse will be maintained on premises. While it is common for production companies to maintain some type of central storage facility it is not common for the companies to store spare part for every type of valve, seal, gasket, flange or other component that could potentially leak at one of hundreds of production locations.

9. What would require a shutdown of a tank battery? How long would the shutdown last? What excess emission would result from the shutdown? Please provide documentation/justification with this.

As drafted the LDAR provisions of the GAO are not limit to tank batteries – they would include meter skids, separators, heater treaters, engines, compressors, vapor combustors, flares, dehys, pneumatic pumps, controllers, wellheads, and any other type of equipment located at a facility. In many cases it may not be as simple as making a repair on a tank that can be blinded off while other tanks and equipment located at a facility remain in service. Safely repairing a high pressure leaking valve on a wellhead or meter skid could involve shutting in the well. Such a shutdown could involve blowing down all pressurized equipment (compressor, treater, separator, etc) and/or blowing down the well itself. Similar situations could result from the need to conduct repairs on separators, treaters, compressors, etc. Depending on the severity of the repair, a shutdown could last hours or it could last several days.

DAQ recently changed the monitoring frequency from 3 months to 6 months based on input from industry.

10. Why should this frequency be change? What is the appropriate frequency? What is the impact to sources? Please provide documentation/justification of this.

A fundamental cost-benefit analysis would dictate that not all sites be treated equally. A wellsite producing 120 bbls per day of oil or condensate will have higher uncontrolled potential emissions and higher potential fugitive emissions than a stripper well producing 6 bbls per day of oil. Yet the monitoring costs are likely very similar. The EPA's analysis of LDAR at upstream oil and gas facilities indicated that such programs were not cost effective and hence the EPA opted not to pursue requiring LDAR at upstream oil and gas facilities in NSPS Subpart OOOO. *"We evaluated various options for reducing VOC emissions from equipment leaks at sites, gathering and boosting facilities, and transmission and storage facilities, but found these options not to be cost effective."* (EPA, 2012 Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews 40 CFR Parts 60 and 63, Response to Public Comments on Proposed Rule August 23, 2011 (76 FR 52738), page 144).

Please refer to this excerpt from the Technical Support Document for NSPS Subpart OOOO:

8.5.1 Evaluation of Regulatory Options for Equipment Leaks

8.5.1.1 Well pads

The first regulatory option of a subpart VVa LDAR program was evaluated for well pads, which include the wells, processing equipment (separators, dehydrators, acid gas removal), as well as *any heaters and piping. The equipment does not include any of the compressors which will be regulated separately. For well pads the VOC cost effectiveness for the model plants ranged from $267,386 per ton of VOC for a single well head facility to $6,934 ton of VOC for a well pad servicing 48 wells. Because of the high VOC cost effectiveness, Regulatory Option 1 was rejected for well pads.*

The second regulatory option that was evaluated for well pads was Regulatory Option 2, which would require the implementation of a component subpart VVa LDAR program. The VOC cost effectiveness of this option ranged from $15,063 for valves to $211,992 for open-ended lines. These costs were determined to be unreasonable and therefore this regulatory option was rejected.

The third regulatory option requires the implementation of a monthly LDAR program using an Optical gas imaging system with annual monitoring using a Method 21 device. The VOC cost effectiveness of this option ranged from $5,364 per ton of VOC for Model Plant 3to $245,024 per ton of VOC for Model Plant 1. This regulatory option was determined to be not cost effective and was rejected.

The fourth regulatory option would require the implementation of a monthly LDAR program using an optical imaging instrument. The emission reductions from this option could not be quantified; therefore this regulatory option was rejected.

At a minimum, the UDAQ needs to create a tiered structure that dictates variable monitoring frequencies based on the potential for emissions.

11. What equipment should be monitored? Why? How can differently owned sources be identified?

We believe that it is the UDAQ's intention to require leak detection and repair provisions to storage tanks and vapor control system. These sources are the largest likely sources of VOC fugitive emissions. As such, we feel UDAQ should consider only applying LDAR requirements to tanks and tank appurtenances such as pressure relief valves and the vapor control system and associated piping used at the location. This will also simplify the ownership and operator issue as tanks and vapor control systems at a given location are almost always owned and operated by the operator of the well. This removes confusion regarding 3rd party meter skids, tanks owned and operated by chemical suppliers, and rental compressor and genset packages.

12. Please provide the GAO language/permit conditions needed to develop a functional LDAR program. Please provide the basis for program components.

Please refer to proposed language attached separately.

Industry

Utah Proposed GAO

The following provides a policy level commentary on the draft Oil and Gas General Approval Order (GAO). These comments are applicable to the draft as of 12/12/2013. The following comments are not exhaustive but are intended to highlight key areas of disagreement and emphasize the need for significant reform prior to further rulemaking progress.

Preconstruction Authorization

UDAQ's pre-construction application and approval program is problematic. While providing a preconstruction notification or registration is recognized as a necessary element of GAO implementation, UDAQ's current proposed **application process is** counterproductive. For instance, the current draft of the GAO application requires an operator to certify that the source will have throughput of less than or equal to 50,000 barrels of oil or condensate per year. This certification is difficult, if not impossible, to make prior to the well being drilled. Thus, an operator will be compelled to coincidentally apply for an Approval Order, completely obviating the value of the GAO. Ideally, use of the GAO would be valid up to some **emission threshold**, arguably 40 tons of a priority pollutant, with a provision that if these thresholds were unavoidably and unpredictably exceeded, that the AO would suffice as a permit shield until such time as an AO could be applied for and received.

Modeling

The draft proposed GAO states that stack heights and possibly property boundary setbacks will be determined based on modeling. Our understanding is that UDAQ will be using 1-hr NO_2 modeling to determine the appropriate stack heights and offset distances. The inability of air quality models to accurately predict 1-hr concentrations is well documented. The Western States Air Resources Council (WESTAR) 1-hr NO_2 modeling ad hoc committee (of which UDAQ staff were members) points out the model's "tendency to overestimate 1-hr NO_2 impacts," and says, "... it is possible that modeled concentrations exceed the standard when monitoring indicates compliance with the standard." Given these concerns with the accuracy of 1-hr NO_2 models, UDAQ should not rely on model results to determine NAAQS compliance.

Wyoming conducted extensive modeling for several facilities to determine the applicability of the 1-hr standard. None of the modeled scenarios demonstrated compliance with the 1-hr standard unless unreasonable stack heights were used. Based on this modeling, it was clear that requiring applicants to demonstrate compliance with the 1-hr standard, via modeling, was not viable. Instead Wyoming relies on extensive ambient monitoring program data to demonstrate that the proposed facility will not prevent attainment with the 1-hr NO_2 ambient standard.

Attached is a figure showing NO_2 monitoring sites in the Uinta Basin. We believe the extensive ambient monitoring network in the Uinta Basin is sufficient to allow UDAQ to adopt this same approach. NO_2 monitoring in areas away from Vernal and Roosevelt show concentrations that are less than 30% of the ambient standard. The NO_2 concentration at Ouray, in the middle of the oil and gas development, is approximately 20% of the standard, demonstrating the NO_2 is not an issue in the oil and gas development area. Higher NO_2 concentrations in Vernal and Roosevelt can be traced to urban "rush-hour" traffic, not oil and gas operations.

Finally, surrounding states do not require modeling for such small sources. **UDAQ has clearly stated that the GAO will only be applicable to facilities that "do not require individual modeling under current rules".** What is currently required in Utah is an impact assessment, which may include evaluations of site conditions or modeling (but not necessarily modeling) and clearly distinguishes between the two. In fact the Emission Impact Assessment Guideline specifies that modeling is to be "conducted at the discretion of the Executive Secretary." We suggest that UDAQ follow their own guidance in regards to modeling which allows the use of the more reliable extensive monitoring data.

If stack heights or setbacks are so high as to be technically infeasible or unavailable, operators will not be able to use the GAO and will have to file NOIs for individual approval orders (AO).

Prescriptive Applicability Limits

The current draft GAO relies heavily on throughput limitations and equipment prescriptions, apparently to limit emissions to a level compatible with GAO usage. Other states utilize applicability limits that are far simpler; as simple as limiting applicability to exploration and production sites and total emission limits. Not only is the focus on throughputs misplaced, but the limits set forth in the draft are in most cases far too low to be utilized. For instance limiting Dehydrators to a maximum capacity of 1 MMscf/day will mean the majority of dehys will not be able to utilize the GAO. The same can be said for all the limits set forth in the draft. As configured, the utility and application of the GAO will be unnecessarily limited. Industry and the UDAQ are likely to find themselves in a situation where half of the production sites are permitted by the GAO and the other half by AO, and perhaps many, by both (See Preconstruction Authorization).

95% vs 98% Control/Destruction Efficiency.

The draft proposed GAO requires a control efficiency of 98% without regard to the type of control device used. While we agree that 98% is achievable for most combustion devices such as flares and vapor combustors, other existing and innovative technologies are not consistently able to achieve 98%. This fact was most recently recognized in Colorado where newly proposed rules require 98% efficiency for combustion devices but allow 95% for other technologies such as vapor recovery units (VRUs). Where technically and economically feasible, VRUs are preferable to combustion devices since hydrocarbons are returned to production and there are no emissions from combustion of VOCs. By demanding 98% for all control devices, UDAQ is effectively mandating utilization of vapor combustors or flares and prohibiting the utilization of more beneficial technologies which can significantly reduce overall emissions when compared to combustion devices.

LDAR

Most operators are supportive of a leak detection and repair (LDAR) program, but there are significant issues with UDAQ's LDAR program as proposed. A functional LDAR program needs to include the following components, none of which are currently included in the draft GAO

- Provision excluding difficult to monitor or unsafe to monitor components from the program.
- Provision for delay of repair when either parts are unavailable or when a full shutdown is required to repair a component.
- Applicability thresholds and frequency requirements – UDAQ is currently proposing monitoring every 6 months without regard to a facilities potential to emit or benefit.
- Clear definition of what is required to be monitored. For example, we believe that only lines conveying materials with greater than 10% VOC by weight should be included in the program. Similarly, we can only commit to monitoring equipment that we operate. There are frequently 3rd party meter skids located on our facilities. The statement that we must "inspect the entire site" is far too broad.

We propose having a focused work session to further develop a functional LDAR program that can be implemented as part of the GAO.

Thank you for your comments on the current draft of the Oil and Gas GAO. This option for permitting small, uniform oil and gas sources has the potential to streamline our permitting process, offering benefits for both the producers and the State. In response to comments on the GAO, I have the following questions/comments:

<u>Preconstruction Authorization</u>
The GAO application process would be the same for a normal AO application process. A source would submit an application and obtain approval for a site prior to construction. If at any time the source discovers that the permit (GAO or AO) does not or will not meet the site's needs, the source would submit a Notice of Intent and obtain an AO for the change. The source would then be required to comply with the newly issued AO.

Example: If a source is operating under a GAO and forecasts that throughput may exceed 50,000 barrels within the first year of operation, the source would submit a Notice of Intent and obtain a normal AO to allow for the projected throughput.

1. What language/verbiage should be added/changed/removed from the draft application and the draft GAO to outline this process?

A throughput limit is currently selected instead of an emissions limit because it was envisioned to be easier to make a compliance demonstration. DAQ is able and willing to change the throughput limit to an emissions limit. If an emission limit is to be used, the DAQ will need to include the following in the permit: calculation methodology, emission factors, gas/oil analyses, stack tests, and any other mechanism to estimate emissions from each emitting unit. The tracking and recordkeeping of these variables will also be required.

2. What should the limit be and how should the condition be worded for the use of an emission limit? Please include calculation methodology, emission factors, gas/oil analyses, stack tests, any other mechanism to estimate emissions, and the supporting documentation/justification for each emitting unit.

<u>Modeling</u>
DAQ is evaluating the NO2 standard with the use of a modeling analysis. The modeling analysis is conservative, so if a model can show attainment of the standard, no further evaluation is necessary. If a demonstration using a modeling analysis cannot be accomplished, other methods will be explored; however, DAQ expects significant resistance without this analysis. It appears that if stacks are vented vertically unrestricted, stack heights may be reduced.

3. What are the minimum and maximum stack heights that a source could comply with without causing backpressure or other problems?

4. What obstacles are there to having stacks vent vertically unrestricted?

Another issue that needs to be clarified is that engines subject to the GAO must meet the emission rates of engines subject to NSPS Subpart JJJJ, even if the engine is exempt from the requirements of NSPS Subpart JJJJ. This emission standard is a result of the BACT process. Engines not able to meet the standards are required to go through the normal AO process.

Prescriptive Applicability Limits

DAQ is able to change the limits and prescriptions listed in the GAO; however, the GAO is not intended to accommodate 100% of sources. A source with differences from the GAO's intent would need to obtain a regular AO for the site.

5. For each limit, condition, or specification listed in the GAO that is desired to be changed, please provide the emission estimates, emission factors, impact of the change (how sources will be affected), the percentage or number of sources not covered by the limit, and any other applicable justification and documentation for the change.

95% vs. 98% Control/Destruction Efficiency

In the version of the GAO posted on the DAQ website two options exist to reduce VOC emissions. The first is to route VOC emissions to "a process unit where the emissions are recycled, incorporated into a product, and/or recovered". The second is to route VOC emissions to a VOC control device with a 98% destruction efficiency. The first option is intended to be a VRU. The second option is a typical control device. The use of 98% is a result of the BACT process.

6. How should the conditions in the draft GAO be worded to clarify the use of a VRU?

7. Please provide a top down BACT analysis for VOC control to allow for an alternative to the 98% control.

LDAR

DAQ is willing to add more detail to the LDAR requirements.

8. What components are unsafe to monitor with an infrared camera at a tank battery? Please provide documentation/justification with this.

NSPS Subpart OOOO allows for a delay of repair if requiring a shutdown, but not for parts availability. It appears that delay is allowed if the emissions from the shutdown would be greater than the fugitive emissions.

9. What would require a shutdown of a tank battery? How long would the shutdown last? What excess emission would result from the shutdown? Please provide documentation/justification with this.

DAQ recently changed the monitoring frequency from 3 months to 6 months based on input from industry.

10. Why should this frequency be change? What is the appropriate frequency? What is the impact to sources? Please provide documentation/justification of this.

11. What equipment should be monitored? Why? How can differently owned sources be identified?

12. Please provide the GAO language/permit conditions needed to develop a functional LDAR program. Please provide the basis for program components.

Other

The GAO must follow current permitting rules. Variations from the permitting rules are not possible through this process. If changes are desired that cannot be achieved through the GAO, the rule-making process must be followed to achieve the desired changes.

12. What obstacles exist that are contained in the GAO? Would the rule-making process be a better option?

The GAO is intended to capture the majority of sources, but not every source. The largest sources and non-standard sources must follow the normal permitting process. If a source does not want to comply with the requirements or limits of the GAO, the source must comply with normal permitting process.

The above information in italics is required to make changes to the GAO. The requested information above will be reviewed by DAQ and may or may not be incorporated into the GAO.

Thanks,

Alan Humpherys <ahumpherys@utah.gov>

GAO discussion documents

1 message

Rusty Frishmuth <rfrishmuth@billbarrettcorp.com> Wed, Nov 27, 2013 at 9:34 AM
To: "ahumpherys@utah.gov" <ahumpherys@utah.gov>
Cc: "Brock LeBaron (BLEBARON@utah.gov)" <BLEBARON@utah.gov>, "Reginald Olsen (rdolsen@utah.gov)" <rdolsen@utah.gov>, "'bjhammer@newfield.com' (bjhammer@newfield.com)" <bjhammer@newfield.com>, "Mark Peak (mark.peak@qepres.com)" <mark.peak@qepres.com>, Duane Zavadil <DZavadil@billbarrettcorp.com>, "Mike Smith (Mike.Smith@qepres.com) (Mike.Smith@qepres.com)" <Mike.Smith@qepres.com>, "Sam Knaizer <sknaizer@newfield.com> (sknaizer@newfield.com) (sknaizer@newfield.com)" <sknaizer@newfield.com>, "Douglas Henderer - NEWFIELD EXPLORATION (dhenderer@newfield.com)" <dhenderer@newfield.com>, "Ursula Rick (URick@westernenergyalliance.org)" <URick@westernenergyalliance.org>, "Schlichtemeier, Chad" <Chad.Schlichtemeier@anadarko.com>, "Karen Pratt (Karen_Hill-Pratt@xtoenergy.com)" <Karen_Hill-Pratt@xtoenergy.com>

Alan – please find attached two documents per our discussion last Friday. The first is our original redline first provided to you on 11-15-13. I included that here so that there's a complete package of documentation. The second document is a summary of the outcome of our discussions last Friday. It contains what we believe to be the GAO conditions that are agreeable to both UDEQ and the operator's sub-committee. We feel that we have made significant progress and at this point really need to focus on NOx modeling and what an LDAR program would look like. This document includes an attachment that summarizes our understanding of the resolution of each comment made in the 11/15/13 redline.

In light of the need to provide this information in advance of the stakeholder meetings next week these documents are the product of a sub-committee consisting of reps from BBC, Newfield and QEP. As we progress in the process additional operators may provide additional comment.

I'll be available today until about 2 PM today and any time on Monday to discuss any questions you may have. I also should be at UDEQ around 9 AM on Tuesday if you wanted to meet briefly in person before the stakeholder meeting at 10.

Rusty Frishmuth, P.E.

Environmental Health & Safety Manager

Bill Barrett Corporation

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2 attachments

GAO version 0.1_Draft 111513.docx
59K

GAO comments and discussion - Version 2.0.docx
29K

Applicability
Majority of typical oil and gas production facilities would qualify for coverage. Compressor stations and large centralized batteries will still require site-specific NOI and resulting AO.

Application
Operators will submit application requesting coverage under the GAO. Application will include customary site information (e.g. location, operator, etc) as well as an inventory of equipment located at the facility with accompanying emissions estimates.

Produced Fluids Storage Tanks
- *Contents* – crude oil, natural gas condensate, and/or produced water
- *Maximum site-wide capacity* – 3,000 bbls
- *Maximum individual capacity* – 550 bbls
- *Other requirements as proposed in II.B.3*

Discussion – Large number of operators utilize 500 bbl tanks as larger tanks mean fewer tanks which mean less insulation, piping, etc. Typical production location is comprised of 3-4 tanks, a site-wide capacity limit of 3,000 bbls allows for typical locations with small contingency for up to 2 additional 500 bbl tanks for smaller centralized batteries or batteries located at multi-well pads.

Dehydrator
- *Maximum capacity* – 2 MMscf/day
- *Other requirements as proposed in II.B.4*

Discussion – The most common sizes of field natural gas dehydration units range from 1 to 2 MMscf/day. Establishing a maximum capacity of 2 MMscf/day would encompass most field installations and will also coordinate with the MACT HH applicability threshold of 2 MMscf/day.

VOC Control Device
- *Minimum control efficiency:* 98% for combustion devices, 95% for other control devices
- *Other requirements as proposed in II.B.4, excluding stack height requirement for vapor combustors*

Discussion – While 98% is achievable for combustion devices such as flares and vapor combustors other innovative technologies may not be able to make 98%. Establishing 98% as the only allowable control threshold will force operators to default to use of a combustion device and deter from the exploration and implementation of innovative tank control technologies such as the SlipStream system (http://www.remtechnology.com/products/rem/slipstream.aspx) where tank vapors can be captured and used as fuel in internal combustion engines. This concept has been recently embraced in Colorado where a conscious decision was made to offer a two tiered control threshold in order to not deter bringing new technologies to market. It should also be noted that while flaring and combustion are good controls, there is a regulatory trend to get away from that as a preferred control method. As mentioned above, establishing 98% as the control efficiency for all controls will likely exclude non-flare/combustion methods from being actively considered.

Where utilized, vapor combustors represent a very small source of NOx and hence a stack height requirement is not necessary. Vapor combustors are factory fabricated and come in all sizes and shapes to meet the needs of various operating scenarios. A restriction on stack height may prohibit operators from utilizing the combustor that is best suited for a given application. Please refer to http://www.leedfab.com/Combustors-Enclosed-Flares.aspx and http://cimarron.cwfc.com/docs/ecd.pdf for additional information on combustor sizes and stack heights.

Pumpjack, gas lift, or generator engines

- *Maximum site-wide hp rating* – TBD based on NOx modeling
- *Fuel* – natural gas or propane
- *Stack height* – TBD based on NOx modeling
- *Emissions standards* – All engines shall comply with NSPS Subpart JJJJ and/or RICE MACT as applicable.

Natural Gas-Driven Pneumatic Device Requirements

- *Constant-bleed natural gas-driven pneumatic devices shall have a bleed rate of less than 6 standard cubic feet per hour. High bleed devices may be utilized for safety or technological feasiblilty issues provided justification is provided in accordance with 40 CFR 60.5415 and operator complies with 40 CFR 60.5415(d).*

Discussion – There are instances, particularly in wet gas systems, where low-bleed devices are not technologically feasible. In wet gas service low-bleed pneumatic devices tend to clog, stick open, and in the end vent more gas than an equivalent high-bleed device. While we are committed to installing low bleed pneumatic devices wherever possible there are instances where usage of high-bleed or continuous bleed devices represent the best available means to minimize emissions.

Boilers/Heaters

- *Maximum site-wide capacity* – 10 MMBtu/hr combined
- *Stack height* – TBD based on NOx modeling

Discussion – The average tank heater utilized in the basin ranges from 0.75 to 1 MMBtu/hr. Allowing up to 6 heated tanks yields a total potential of 6 MMBtu/hr in aggregate. A typical heater treater burner is rated for 1 to 2 MMBtu/hr for a site-wide total of 7 to 8 MMBtu/hr. A site-wide total of 10 MMBtu/hr will accommodate the number of tanks and other ancillary equipment being considered for authorization under a GAO.

Truck Loading Operations

- *All loading operations shall employ submerged fill loading techniques*

Methanol and Ethylene Glycol Storage

- *Maximum site-wide capacity* – 1,000 gallons

Discussion – Where present, methanol tanks and glycol storage tanks are typically 500 gallons. This is a standard size in the industry and a standard size provided by the methanol and ethylene glycol suppliers who also frequently provide us with the tanks to store their product. 500 gallons is also a size that allows for adequate inventory and storage. A smaller storage volume would require frequent refill – effectively increasing vehicle miles and associated NOx and VOC emissions in the basin. The overall capacity allows for adequate storage of both chemicals on location if needed.

One Emergency/Overflow Tank

- *Maximum capacity* - 550 bbls

Site-Wide Requirements

- *Maximum site-wide throughput limit – 50,000 bbls*

- *Maintain rolling 12 month emissions estimates, submit initial equipment inventory and emissions inventory with GAO application, provide subsequent annual emissions inventory.*

- *All produced gas used as fuel or routed to a gas gathering system*

- *Site-wide VOC survey with IR camera*
  Discussion – Additional discussion of an IR camera LDAR program is required. In particular, program elements such as applicability thresholds, frequency of inspection, management of difficult or unsafe to monitor components, delay of repair, and monitoring frequency step-down or off-ramps need to be incorporated into the GAO.

Applicable Federal Requirements

- *In addition to the requirements of the GAO, facilities shall comply with all applicable requirements of:*
  - *NSPS Subpart A - General Provisions*
  - *NSPS Subpart JJJJ*
  - *NSPS Subpart OOOO*
  - *MACT/NESHAPS Subpart A – General Provisions*
  - *MACT Subpart HH*
  - *MACT Subpart ZZZZ*

ATTACHMENT 1

Summary of Status of Comments and Edits on Draft General Approval Order Resulting from November 22, 2013 Conference Call by UDAQ, Newfield, Bill Barrett, and QEP on the Comments and Edits Provided in the November 15, 2013 Edited Version from Bob Hammer of Newfield

November 15, 2013 Comments and Edits

- **Comment BH1**: This type of change will be made

- **Comment BH2**: Resolving the approach to this issue will continue through correspondence currently underway with UDAQ's air quality dispersion modelers.

- **Comment BH3**: UDAQ would like to include small sources such as tank heaters and heater treaters as sources with permit conditions in the GAO. Industry will get back in touch with UDAQ on this issue since we feel it is unnecessary to impose the burden of permit conditions on these small sources. Since UDAQ's position on this issue appears in large part based on the results of dispersion modeling for these small sources, industry will continue working with UDAQ dispersion modelers in gathering information for this issue. Revisions to the dispersion modeling may demonstrate that impacts from these sources are much smaller than modeling initially indicated.

  One option is for UDAQ to not specifically list the exemptions while still implementing the Utah regulations that allow the exemptions.

- **Comment BH4**: UDAQ is open to modifications in storage tank capacity. In this response document we are providing justifications on the sizes to be used.

  Once the tank battery is registered under the GAO it would be allowable to change the tank inventory without the need for additional separate approval, as long as the GAO conditions are met.

  UDAQ will develop and include language as to why Kb is not applicable.

- **Comment BH5**: UDAQ is open to modifications in dehydrator capacity. In this response document we are providing justifications on the size to be used.

  Justification for using an approach with an option for 95% control is provided earlier in this document.

- **Comment BH6**: The maximum allowable engine HP will be determined in large part based on the results of dispersion modeling for these small sources. Industry will continue working with UDAQ dispersion modelers in gathering information for this issue.

"Pipeline quality natural gas" or "natural gas" will be changed to "natural gas or propane" throughout the GAO.

- **Comment BH7**: See Comment BH3 above.

  See Comment BH6 on "natural gas or propane" language.

- **Comment BH8**: Glycol reference will be changed to ethylene glycol.

  Justification for changing the storage vessel capacity has been provided earlier in this document.

- **Comment BH9**: See Comment BH3 above.

- **Comment BH10**: The words will be changed but the throughput value will remain at 50,000.

- **Comment BH11**: This change will be made

- **Comment BH12**: This change will be made

- **Comment BH13**: This type of change will be made. UDAQ will likely reword.

- **Comment BH14**: This change will be made

- **Comment BH15**: This change will be made

- **Comment BH16**: Additional discussion of an IR camera LDAR program is required. In particular, program elements such as applicability thresholds, frequency of inspection, management of difficult or unsafe to monitor components, delay of repair, and monitoring frequency step-down or off-ramps need to be incorporated into the GAO..

  VOC specific changes will be made.

- **Comment BH17**: VOC specific language changes will be made.

- **Comment BH18**: These types of changes will be made as long as additional information is provided as presented. See Comment BH16.

- **Comment BH19**: Each of the proposed changes in II.B.1.c.1 will be made.

- **Comment BH20**: See Comment BH2

- **Comment BH21**: This change will be made.

- **<u>Comment BH22</u>**: See Comment BH5
- **<u>Comment BH23</u>**: See Comment BH2
- **<u>Comment BH 24</u>**: Justification for these changes is provided earlier in this document.
- **<u>Comment BH25</u>**: This change will be made
- **<u>Comment BH26</u>**: This change will be made
- **<u>Comment BH27</u>**: This change will not be made
- **<u>Comment BH28</u>**: See Comment BH2
- **<u>Comment BH29</u>**: This change will be made
- **<u>Comment BH30</u>**: See Comment BH2

Many things are unknown during the first days of production that influence emissions including the following.

- Flowrate uncertainties
- What type of separator can be used (high/low)
- Composition of the production
- Decline curve determination
- Well pressure
- Production is not stabilized

These issues could result in significant differences in the initially estimated production, which in turn could affect the applicability of the General Approval Order and estimated emissions.

In order to limit the risk of underestimating production, applicants would have to significantly overestimate production, and therefore overestimate emissions and valuable\critical emission offsets.

This rationale for allowing operators time after start of production to file paperwork on production and emissions was included in the preamble in NSPS OOOO.

> *According to the petitioners, in many cases at well sites and at other locations, emissions cannot be estimated until the storage vessel is in operation, given the **uncertainties in flowrate and other characteristics of the liquid flowing to the vessel**. When a new well comes online, even at a location where wells are already in production, liquids from the new well can have **significantly different characteristics than liquids from the existing wells**.*

The IPAA letter on NSPS OOOO provided the following rationale for allowing operators time after start of production:

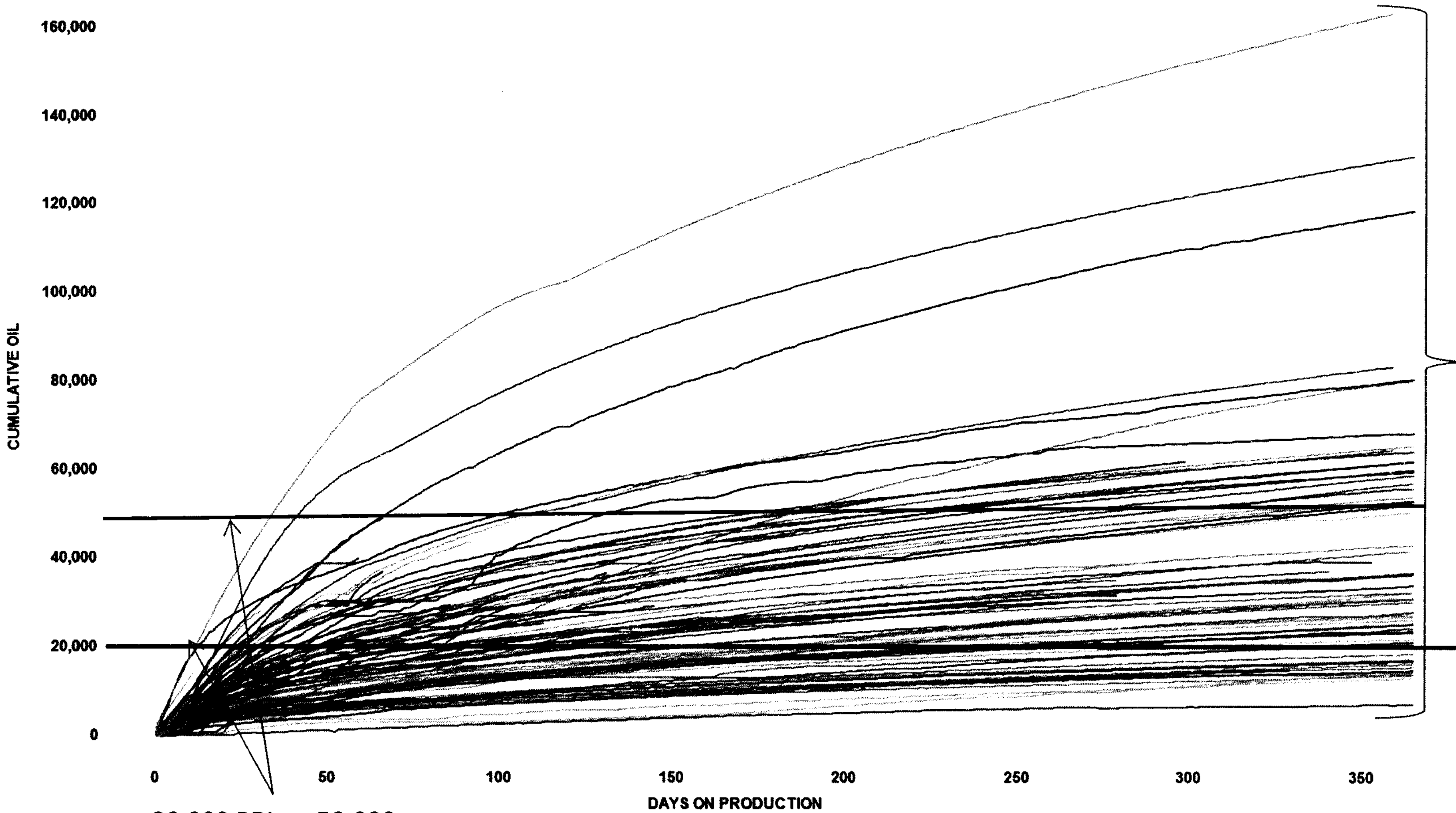
> *As currently proposed, owners and operators of Group 2 storage vessels must determine their VOC emissions by April 15, 2014 or 30 days after startup, whichever is later. Id. § 60.5395(c)(1) and (2). If VOC emissions are projected to be equal or greater than 6 TPY, then controls must be installed by April 15, 2014 or 60 days after startup, whichever is later. Id. § 60.5395(d). These time periods are simply too short. At a minimum, **90 days** is necessary to conduct the required emissions calculation and install controls. **The first 30 days of production normally are not representative of stabilized production from a well, and are subject to variation that could result in the overestimation or underestimation of the emissions from storage vessels associated with that well.** Thus, at least 45 days is needed to evaluate and accurately calculate projected annual emissions from a storage vessel. Another 45 days—again, at a minimum—would be needed to engage a contractor and install the necessary controls. Providing a total of 90 days to make the initial emissions determination **and** install any necessary controls will ensure a more reliable emissions estimate and afford the regulated community sufficient time to contract for the testing/modeling of emissions and installation of controls. Accordingly, IPAA recommends that EPA extend this compliance period to 90 days.*

CDPHE's partial adoption of NSPS OOOO had a generic explanation in their preamble:

> *Second, the Division proposes to adopt the requirements for storage vessels at well sites, associated with exploration and production, only after the first 90 days of production has occurred. This is consistent with the Division's approach towards exploration and production activities, allowing owners and operators time **to determine if exploration and production activities will result in reportable emissions.***

Well Variability

12 month cumulative production varies from <6,000 bbl to 160,000 bbl

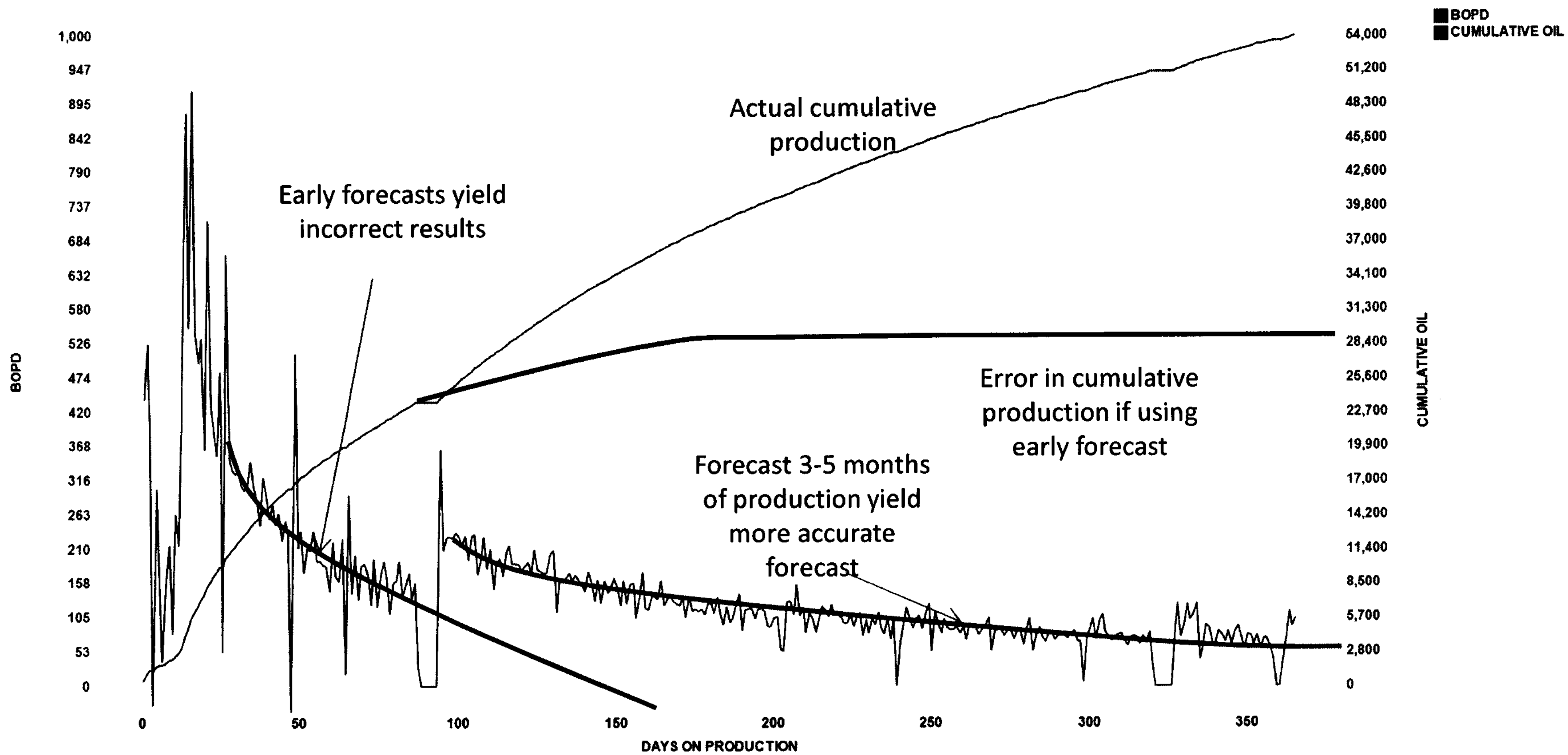


Large variation between vertical wells, horizontal wells, and super extended horizontal wells first year cumulative production

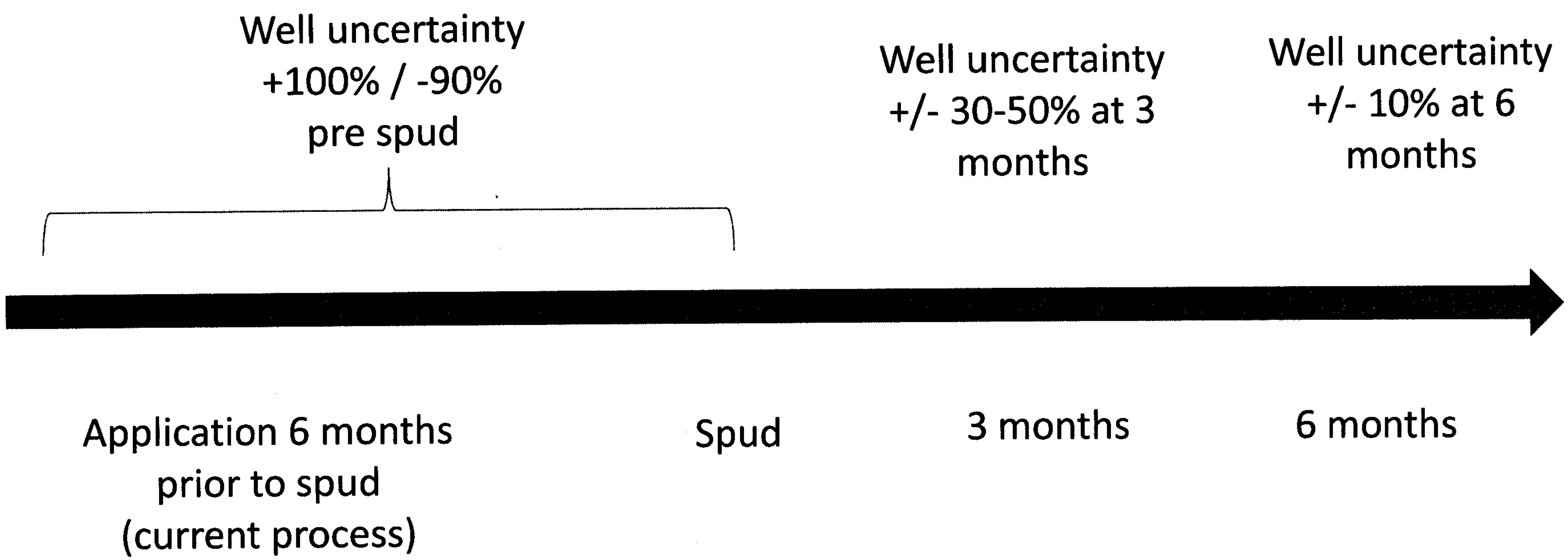
20,000 BBL or 50,000 BBL annual production limits proposed for general air permits are exceeded by a large fraction of wells

Production Forecasts

Need several months of production history to get accurate forecasts



Well Timing and Production Uncertainty



Permitting prior to production vs. after FDOP

- Permitting prior to FDOP
  - High uncertainty of production prior to spud makes estimation difficult
  - Permits would be submitted 6 months prior to spud
    - Multiple rig schedule changes in that time mean that many more wells need to be permitted as backups for every well that gets drilled. Large permit redundancy.
  - High estimates penalize operators air credits if actual production comes in lower
  - Operators will likely adopt strategy of permitting low volumes with permit modifications after wells online
    - Result... every well will get multiple permit revisions to preserve air emissions credits
    - Difficult to administer for agencies and operators
- Permitting after FDOP
  - Relatively low uncertainty of first year production after several months of production data
  - Operators more likely to file one permit that is very close to actual first year cumulative production, and will significantly reduce need to resubmit modifications to permits
  - Easier to administer for agencies and operators
  - Similar to existing framework in other states

WESTERN ENERGY
ALLIANCE

Agenda for Meeting on GAO with UDAQ
September 6, 2013, 1:00-3:00
UDAQ, Four Corners Room

1:00 pm – Introductions

Alan Humpherys

- Overview of the General Approval Order
- Permit organization\layout

1:15 pm-Summarize UDAQ proposed terms and conditions of UDAQ's current draft

- Applicable equipment
- Facility-wide:
- Equipment specific:
    - Emission limits
    - Throughput\size
    - Monitoring\recordkeeping
    - Testing\compliance methods
    - Operations\equipment

1:30 pm – Draft industry counter-proposal

Bob Hammer

- Approval timeline:
    - No pre-construction delay
    - Pre-drill registration
    - Post-completion registration
    - Mature fields
- Terms and conditions:
    - Facility-wide:
    - Equipment specific:
        - Emission limits
        - Throughput\size
            - Compared to 12-months at new wells in other states (100,000 – 130,000) bbls/yr
        - Monitoring\recordkeeping
        - Testing\compliance methods
        - Operations\equipment
- One General Approval Order for both oil and natural gas

1:45 pm – Response and discussion

- Terms and conditions (30+ min)

Source Type	Emission Limits	Controls	Throughput\Size	Monitoring\ recordkeeping	Testing\Compliance method	Operations\Property\Equipment
Facility-wide	Entire site will comply with a 10% opacity limit, unless otherwise specified Estimated facility-wide potential emissions *(informational, not enforceable)* • CO: 6.65 tpy • NOx: 2.80 tpy • PM10: 0.13 tpy • PM2.5: 0.13 tpy • VOCs: 3.04 tpy • Total HAPs: 0.54 tpy • CO2 equivalent GHG: 1,000 tpy				Send installation notification within 18 months of when equipment is operational	A single pumpjack powered by either a natural gas-fired engine or an electric motor A heater treater Oil and water stored in tanks prior to being transported off site by trucks Various natural gas-fired boilers/heaters Produced gas will be routed to a sales pipeline A VOC control device for VOC and HAP emissions from the oil and water tanks.

Source Type	Emission Limits	Controls	Throughput\Size	Monitoring\ recordkeeping	Testing\Compliance method	Operations\Property\Equipment
Storage Tanks and truck loading		Tank vapor combustors/flares and/or adsorbers for 98% control of oil and water tanks Thief hatches kept closed and latched when not unloading or during maintenance Truck loading: • Submerged/bottom-fill tanker trucks • Vapor balance system	Limit of 20,000 barrels of oil per rolling 12-month period Crude oil tanks: • Max site-wide: 940 bbls • Max size per individual tank: 470 bbls Produced water tanks • Max: site-wide: 940 bbls • Max size per individual tank: 470 bbls Truck loading equipment	calculate a 12-month total by the 20th of each month Keep oil production records on a daily basis Keep the following records of leak detection and repair • Leak location • Analyzer reading • What corrective action was taken • Date corrective action was completed Keep the following records of gas imaging camera inspections: • date • an image/picture of each piece of equipment • an image/picture of each detectable leak Inspect thief hatches at least once per month Keep the following records of thief hatch inspections: • Date • Status • Any corrective actions • Date of any corrective actions	Once every 3 months Use a gas imaging camera (such as FLIR) to check for leaks • If leak detected then either fix or evaluate using EPA Method 21, 40 CFR 60, Appendix A If a leak is detected evaluate the leak with an analyzer or take corrective action Leaks >= 500 ppm will be fixed within 15 days Determine oil production by process flow meters and/or sales records	

Source Type	Emission Limits	Controls	Throughput\Size	Monitoring\Recordkeeping	Testing\Compliance method	Operations\Property\Equipment
Engines	meet NSPS Subpart JJJJ Between 25 and 100 hp: 2.84 g/hp-hr HC+NOx		A single engine rated <= 65 hp	Keep the following records: • Manufacturer guaranteed HC+NOx emission rate • Manufacturer's operating and maintenance instructions • Maintenance records: ✓ Description of maintenance ✓ Date of maintenance	Documentation from the manufacturer that the engine will meet the emission rate	Use pipeline-quality natural gas Operate the engine according to manufacturer's written instructions Stack heights: • Vertical unrestricted: >= 12 ft • Vertical restricted: >= 20 ft
Flares	No visible emissions from VOC control device			Keep records of the following: • Manufacturer guaranteed control/destruction efficiency • Manufacturer's operating and maintenance instructions • Date and type of any maintenance conducted		Operate according to manufacturer's written instructions Vent vertically with a stack height of at least 18 feet.
Boilers\Heaters		Proper maintenance is BACT	1 mmBtu/hr maximum combined site-wide boilers/heaters using NG			Use pipeline-quality natural gas Stack heights: • Vertical unrestricted: >= 18 ft • Vertical restricted: >= 22 ft
Other Equipment Methanol and glycol storage Compressors and pumps Emergency/overflow tank			Site-wide 150 gallons combined methanol and glycol storage One 470 bbl emergency/overflow tank			

1-hour NO_2 dispersion modeling or stack height requirements are not necessary for well pad NOIs for reasons including the following:

<u>NO_2 CONCENTRATIONS IN THE REGION ARE LOW</u>

-The NO_2 standard is the 98th percentile threshold of 100 ppb

-NO_2 in the oil and gas fields is very low (UBOS 2012-2013 study)

Monitoring sites at rural locations away from traffic (98th percentile 11/12 – 3/13):

- Fruitland: 15.0 ppb
- Rabbit Mt: 16.3 ppb
- White Rock: 17.3 ppb

-2013 UBOS study NO_2 concentrations are highest in areas influenced by traffic and population.

Monitoring sites near traffic and population influences (98th percentile 11/12 – 3/13):

- Vernal: 58.9 ppb
- Roosevelt: 36.8 ppb
- Redwash: 34.0 ppb
- Ouray: 37.0 ppb
- Myton: 23.6 ppb
- Rangely: 21.3 ppb
- Horsepool: 18.5 ppb

<u>1-HOUR NO_2 ISSUES CORRELATE WITH LARGE POPULATIONS AND HIGH TRAFFIC AREAS</u>

2013 UBOS study:

"NO_X concentrations at Vernal and Roosevelt were among the highest observed at any study site and exhibited the largest diurnal changes, with highest NO_X in the morning hours (Figure 1-21), likely due to diurnal traffic patterns in these cities. Red Wash, located only 250 m from a well-traveled highway, also showed significant diurnal variability, but the peak NO_X at Red Wash was at midday. NO_X also peaked at midday at the Ouray and, to some extent, Horsepool sites, similar to observations made during winter 2011---12 (Lyman et al., 2013). A counter at the Horsepool site during winter 2011-12 observed highest traffic at midday."

"Correlation between NO_X concentrations and proximity of study sites to oil and gas operations were either not significant or weak, but NO_X was correlated with population and elevation."

-Correlating NO_2 impacts with traffic and population centers is consistent with February 10, 2010 EPA Federal Register on the 1-hour NO_2 National Ambient Air Quality Standard.

Page 6476:
"While NO_X is emitted from a wide variety of source types, the top three categories of sources of NO_X emissions are on-road mobile sources, electricity generating units, and non-road mobile sources."

Page 6479:
"...estimates presented in the REA [Risk and Exposure Assessment] suggest that on/near roadway NO_2 concentrations could be approximately 80% (REA, section 7.3.2) higher on average across locations than concentrations away from roadways and that roadway-associated environments could be responsible for the majority of 1-hour peak NO_2 exposures (REA,Figures 8–17 and 8–18)."

-The EPA fact sheet for the final revisions to the National Ambient Air Quality Standards for NO_2 highlights the fact that the 1-hour NO_2 is an issue at population centers and high traffic areas:

Page 1:

To determine compliance with the new standard, EPA is establishing new ambient air monitoring and reporting requirements for NO_2.

- In urban areas, monitors are required near major roads as well as in other locations where maximum concentrations are expected.
- Additional monitors are required in large urban areas to measure the highest concentrations of NO_2 that occur more broadly across communities.
- Working with the states, EPA will site a subset of monitors in locations to help protect communities that are susceptible and vulnerable to NO_2-related health effects.

Page 2:

EPA is setting new requirements for the placement of new NO_2 monitors in urban areas. These include:

Near Road Monitoring

- At least one monitor must be located near a major road in any urban area with a population greater than or equal to 500,000 people. A second monitor is required near another major road in areas with either:

  (1) population greater than or equal to 2.5 million people, or

  (2) one or more road segment with an annual average daily traffic (AADT) count greater than or equal to 250,000 vehicles.

  These NO_2 monitors must be placed near those road segments ranked with the highest traffic levels by AADT, with consideration given to fleet mix, congestion patterns, terrain, geographic location, and meteorology in identifying locations where the peak concentrations of NO2 are expected to occur. Monitors must be placed no more than 50 meters (about 164 feet) away from the edge of the nearest traffic lane.
- EPA estimates that the new NO2 monitoring requirements will result in a network of approximately 126 NO_2 monitoring sites near major roads in 102 urban areas.

Community Wide Monitoring

- A minimum of one monitor must be placed in any urban area with a population greater than or equal to 1 million people to assess community-wide concentrations.
- An additional 53 monitoring sites will be required to assess community-wide levels in urban areas.
- Some NO_2 monitors already in operation may meet the community-wide monitor siting requirements.

Monitoring to Protect Susceptible and Vulnerable Populations

- Working with the states, EPA Regional Administrators will site at least 40 additional NO_2 monitors to help protect communities that are susceptible and vulnerable to NO_2

Page 3:

The new standard must be taken into account when permitting new or modified major sources of NO_X emissions such as fossil-fuel fired power plants, boilers, and a variety of other manufacturing operations.

<u>EPA AND STATE POLICIES DON'T REQUIRE MODELING FOR SMALL SOURCES OF EMISSIONS SUCH AS WELL PADS.</u>

-The WESTAR 1-hour NO_2 Modeling Ad Hoc Committee outlined the difficulties involved with trying to model 1-hour NO_2 impacts:

Page 1
"Accurately modeling 1-hour impacts is therefore more challenging than modeling impacts over longer averaging periods. The current techniques for estimating the amount of atmospheric conversion of oxide of nitrogen (NO_X) into nitrogen dioxide (NO_2) may also be conservative, especially in the nearfield. This apparent tendency to overestimate 1-hour NO_2 impacts, coupled with an *extremely stringent* 1-hour NO_2 standard, leads to hurdles that are proving difficult to overcome.

To demonstrate compliance with EPA's new 1-Hour NO_2 NAAQS air quality dispersion modeling analysis must be performed which shows that emissions from a source will not cause or contribute to a violation of the standard.

Initial performance of air quality dispersion modeling for the 1-hour standard has found that demonstrating compliance with the new standard is challenging, and can result in significant delays and hurdles in the permitting process and in granting approvals.

The 1-hour NO_2 standard is more stringent than the previous NAAQS, and as such the margin for error is smaller than it has been in the past, and when combined with the conservatism to modeling guidelines it is possible that modeled concentrations exceed the standard when monitoring indicates compliance with the standard. Such results can lead to uncertainty and unnecessary commitment of scare state resources to solve nonexistent issues.

EPA is aware of the difficulties surrounding these complex issues and has attempted to address the problems by issuing guidance memorandums (dated June 29, 2010 and March 1, 2011) to provide further clarification and guidance on the application of Appendix W guidance for the 1-hour NO_2 standard."

Page 4
"In summary, the 1-hour NO_2 standard is extremely stringent and the 1-hour modeling techniques tend to be conservative (for the reasons described in the Additional Background section of this report). Therefore, a larger SIL may be needed to provide relief from the "false positives" that will likely come from the current NO_2 modeling techniques."

-Well pad NO_X emissions are typically less than 5 tpy, far below the NO_2 significant emission rate (SER) of 40 tpy

-EPA does not require modeling of sources below the SER per 40 CFR 52.21 (m)(l)(i)(a), 40 CFR 51.166(m)(l)(i)(a), 40 CFR 52.21 (m)(l)(i)(b), and 40 CFR 51.166(m)(l)(i)(b)

August 23, 2010 EPA Wood NO_2 Memo, pg 10/11:
Under existing regulations, an ambient air quality impact analysis is required for "each pollutant that [a source] would have the potential to emit in significant amounts." 40 CFR 52.21 (m)(l)(i)(a), 40 CFR 51.166(m)(l)(i)(a). For modification, these regulations require this analysis for "each pollutant for which [the modification] would result in a significant net emissions increase." 40 CFR 52.21 (m)(l)(i)(b), and 40 CFR 51.166(m)(l)(i)(b). EPA construes this regulation to mean that an ambient impact analysis is not necessary for pollutants with emissions rates below the significant emissions rates in paragraph (b)(23) of the regulations. No additional action by EPA or permitting authorities is necessary at this time to apply the 40 tpy significant emissions rate in existing regulations to the hourly NO_2 standard.

-Other State agencies frequently exclude modeling if NO_2 emissions are below the SER

-Utah State Regulations Title R307, Rule 410, Section 4 (R307-41-4) only requires modeling for sources that are above the SER

-Utah Division of Air Quality Emissions Impact Assessment Guidelines :

> Section I.a (page 1): New sources, or modifications to existing sources, whose total controlled emission increase levels are greater than those listed in Table 1 (R307-410-4) are required to submit a dispersion modeling analysis as part of a complete NOI.
>
> Page 2 paragraph 2: For new sources or modifications to existing sources, whose total controlled emission increase levels are less than those listed in Table1, DAQ staff will conduct an in-house EIA. This EIA will include a review of previous modeling, an evaluation of site specific conditions, application of a conservative impact assessment, or an in-house modeling exercise. Site-specific conditions that lead to a more detailed review include such factors as: special meteorological events that may occur, elevated terrain close to the facility, pollutant release mechanisms which result in low final plume heights (i.e. low pollutant release heights, low gas exit temperature or velocity, or horizontal or restricted venting system. NAAQS based on 1-hour or 24-hour standards typically contribute to the need to conduct in-house modeling. <u>In-house modeling will be conducted at the discretion of the Executive Secretary.</u>

As shown throughout this document the current modeling program and methods are unsuited for these insignificant oil and gas sources. Furthermore, the modeling is an expensive and unnecessary add on cost to the air permit application. The simplest modeling exercise will add $2,000 to $5,000 in cost to the application. The modeling alone will at least double the cost of a routine oil and gas air permit application.