Comments from Tom Velalis (Ohio Environmental Protection Agency), dated 1/13/2017			
No.	**Page**	**Reviewers Comment**	**Response**
1	8	On page 8, under Minor Source Threshold for Ohio, enter Synthetic Minor	Done.

Comments from Andrew Bollman (North Carolina Department of Environmental Quality), dated 12/30/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1	8	The only comment that North Carolina has on the draft Oil & Gas memorandum is that North Carolina's entry in Table 3 (pg. 8) should be revised to "North Carolina Department of Environmental Quality" (our name was changed a little over a year ago: https://deq.nc.gov/blog/2015-10-26/denr-has-new-name-nc-dept-environmental-quality).	Done.

Comments from Stacy Allen (Missouri Department of Natural Resources), dated 12/20/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1	8	After reviewing the comments below and Missouri's numbers in Table 2 of the draft oil and gas report, I completely agree that Missouri's very high emission rate is due to point source interstate natural gas transmission facilities (all our emissions in that total are from natural gas pipeline compressor stations, not gathering). It appears that Table 2 is trying to estimate a range of NOx and VOC emission rates by comparing total point source emissions to natural gas production. Since Missouri's point source emissions from interstate transmission facilities are unrelated to the natural gas production in the state, the emission rates are not meaningful in comparison to other states. If it's not possible to make the more apples-to-apples comparison by removing interstate transmission facility emissions from the totals, I would recommend leaving at least the last five states with emission rates in the table blank or asterisked (TN, IL, NE, MD, MO). These five states natural gas production is at least an order of magnitude smaller than the next largest state (NY at 20,000 mmcf),	It is not possible to separate interstate compressor stations from intrastate compressor stations. We will remove the columns with lb/MMSCF emission rates.

Comments from Stacy Allen (Missouri Department of Natural Resources), dated 12/20/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		and their NOx emission rates are an order of magnitude higher than the highest NOx rate state (KS at 212, though that may be too high based on interstate point gas transmission facilities).	

Comments from Lynn Deahl (Kansas Department of Health and Environment) dated 12/14/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1	3	I just got around to checking our ~outlier in Table 2's chart for NOx vs. NG production in John Grant's draft O&G report, and saw the (apparently) big ratio for Missouri mentioned in yesterday's call. I'd say that in both cases—as well as several others, apparently, including Illinois, Michigan, Alabama, and Nebraska—the issue is more one of Table 2's data failing to distinguish emissions from intra- vs. interstate pipelines, and the substantial NOx emissions from engines and turbines at the interstate natural gas compressor stations. So really, my (only) feedback to John would be to see whether he couldn't take out the interstate compressor emissions from Table 2, and then make a more apples-to-apples chart.	It is not possible to separate interstate compressor stations from intrastate compressor stations. We will remove the columns with lb/MMSCF emission rates.

Comments from Mark Gibbs (Aether) dated 12/5/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1		Medium Priority / Point - Consider potential analysis of GHGRP pipeline emissions - What does pipeline emissions here? Gathering and Boosting? Transmission and Distribution? Before or after the gas plant? Midstream and downstream? Probably needs to be clearer.	We have added text clarifying that the new reporting requirements are for transmission pipelines and pipeline reporting under the gathering and boosting segment.
2		Following on from this, some sort of diagram, perhaps expanding on the hoary EPA natural gas system diagram, that shows what GHGRP does/will cover against what the tool/NEI does/should cover would be very helpful.	We feel the developing a new diagram is beyond the scope of this project. We have included the EPA diagram with a description of NEI coverage.

Comments from Mark Gibbs (Aether) dated 12/5/2016			
No.	**Page**	**Reviewers Comment**	**Response**
3		In the Low Priority Nonpoint section, I see that there are four source categories that should be included in the tool. Is that it? I seem to recall that in 2012 there were still categories not well addressed, such as mud-degassing. I know Oklahoma does a poor job on produced water. Are there any potentially important major categories not addressed now? And if not, did they get as far as identifying which states are doing a poor job or is that next?	Mud-degassing is included in the O&G Tool as is produced water. In the regional analyses we will work with the states to identify specific categories for uncertainty analyses.
4		Finally, anything about uncertainties in emission factors and/or activity data, super-emitters, short-term events? Basically anything to help with top-down/bottom-up reconciliation?	We have added text discussing potential for super-emitters and there effect on the emission inventory.

Comments from Julie McDill (MARAMA), dated 12/22/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1		The best part of the report is the analysis by state of various factors derived from the GHG program. That section provides a framework of how to incorporate that data and a visual representative of uncertainty. There is substantial variation even within states for most of these factors. Is there a way to use this information to quantify uncertainty? In figure 12-38 the asterisk next to PA simplifies and misrepresents the way PA estimates emissions (described elsewhere in these notes)	Statistical uncertainty analyses may be developed as part of the Regional Analyses, dependent on agency input on prioritization. Added a paragraph to the report that explains how PA estimates emissions based on information provided in your comment on this subject below.
2		Point Source Oil and Gas Summary	
2a		The point source recommendations on page 12 are good.	Noted
2b		This section divides emissions by NAICS code. In general, the NEI places its emphasis on SCC rather than NAICS codes. I am not sure why the NAICS codes are emphasized here and why they are preferred to SCCs for this analysis. If there is a need to prefer NAICS categorization over SCC the document does not explain this well. I think there are some similar problems with overlapping and illogical SCC codes and I would have preferred that these be explored.	We have revised our discussion of O&G point sources based on this comment and other comments received on this subject.
2c		The analysis in Table 2 does not make sense because of the different thresholds for point source reporting in different states. This should be clarified as part of the discussion. Sources are	Removed the emissions per unit of gas production from Table 2.

Comments from Julie McDill (MARAMA), dated 12/22/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		included in point source sector because they exceed an area's threshold for point source accounting. Thresholds are generally 100 TPY unless they have been lowered for some reason, including nonattainment with a NAAQS. It might be helpful to add a column to the table for the reporting threshold by state to see if emission rate is inversely correlated with reporting threshold.	
2d		In addition the text indicates that Table 2 is about midstream sources, but the title of table indicates point sources, so it is not at all clear what the analysis is about.	Revised the text references to Table 2 to clarify that emissions in Table 2 are point source emissions from midstream sources.
2e		The report recommends control and capture efficiency be added to NEI and GHGRP reporting requirements to facilitate controls analysis. This seems like a good idea, but we would have to work with states to get this included.	Agreed. The document has been updated per EPA's comment that effective capture efficiency is included in reporting requirements.
3		The document needs to more carefully capture the diversity in the ways that different states estimate O&G emissions. These are: 1. Reported by facilities to states as point sources and then passed on to NEI. (PA facilities that report emissions include booster compressor stations, gas plants and all unconventional wells) 2. Calculated by EPA using tool and default parameters (many of which are derived from CENSARA study. All of WV emissions are calculated in this way.) 3. Calculated by EPA using tool and a mix of default and state parameters 4. Calculated by states using the tool or means using a mix of default and state parameters (PA conventional wells. See the following paragraph for more details on why we used this approach.) The forth approach was taken by PA for unconventional wells because the tool cannot differentiate between conventional and unconventional wells which have very different characteristics. Conventional wells are older, shallower, lower pressure, were	Thank you for the description of how PA reports emissions. We will add text to the document describing how PA reports emissions. We have clarified that our point source analysis is on the subject of those sources reported in the NEI as point sources (we understand that some S/L/T agency well-site point source emission are reported in the NEI as nonpoint sources).

Comments from Julie McDill (MARAMA), dated 12/22/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		operated less and had less associated equipment and controls. Working with their oil and gas commission, PA was able to differentiate wells and activity between the two well types and we applied appropriate parameters to each. We have heard that the same dichotomy exists in other states (Colorado and Oklahoma mentioned this on calls). The challenge for other states is to differentiate activity records between the two types of facilities. To make things a little more complicated, PA unconventional sources report emissions to the state agency and PA reports those emissions for unconventional sources, rather than estimating those emissions using the tool (Method 1 above). Because the report does not capture the diversity of ways that emissions are estimated by states, Figures 5, 8 and 9 and Table 9 are wrong, at least for PA. In addition, much of the text and conclusions concerning use of the tool and defaults is incorrect because it is not based on a correct understanding of how emissions are estimated.	
4		O&G Tool Factor Inputs	
4a		The document states: "Defaults are typically the average input factor across all basins form CenSARA (2012)14 16 or the average input factor across all basins from the 2014 Subpart W data compilation." This is not completely correct. There are a large number of CenSARA defaults, but these are not an average input factor, rather they are inputs appropriate to CenSARA states that may are be appropriate for the rest of the country, but are the best that we have at present. Other defaults, especially emission factors, are from AP-42 and are seriously out of date – particularly for NOX and CO given the many regulations that address RICE. – Probably a good conclusion is that we should have a review of the engine emission factors done in light of RICE and adjust the factors accordingly.	Added text clarifying that Table 9 only refers to basin factor inputs, not emission factors. Analysis of engine emission factors is included in a separate memo section.

Comments from Julie McDill (MARAMA), dated 12/22/2016			
No.	**Page**	**Reviewers Comment**	**Response**
4b		The default VOC emissions also are also factors intended to estimate "normal" operation. This unfortunately does not address the "fat tail" which according to EDF investigations comes from careless operation (thief hatches left open) or poor maintenance (worn or broken seals).	Good point. We have added discussion of fat-tails.
4c		I do not know where the Subpart W factors come from – did ENVIRON inquire? I am suspicious that they did not as they are completely off base on the CenSARA factors.	Our analysis is based on a review of the referenced document: ERG, 2016. Memorandum: Summary of Analysis of 2014 GHGRP Subpart W Data for Use in the 2014 NEI Nonpoint Oil and Gas Emission Estimation Tool. Prepared for Jennifer Snyder, U.S. Environmental Protection Agency. Prepared by Mike Pring and Stephen Treimel, Eastern Research Group, Inc. November 2016.
5		Document needs a good edit.	Made several edits for clarity.
6		In general the document needs significant editing for english clarity. There are many awkwardly worded sentences that are extremely hard to follow. Example: In support of future NEI cycles' reporting efforts and top-down assessment of the completeness and representativeness of GHG data from this sector, below we have described and analyzed available national O&G inventory input sources.	Revised the reference sentence and made several edits for clarity.
7		Table 4 - Well-site emission source categories in the 2014 NEI (v1) and the GHGRP. There is no indication of the importance of the source types missing from either NEI or GHGRP. It would be helpful to provide % of total emissions rather than check marks so the reader could see if there is something important missing.	For sources missing from the 2014 NEI, Subpart W emissions by source category are not readily available for inclusion in the table. Since we are not recommending changes to Subpart W reporting, we have not included the percent of emissions from sources not included in Subpart W.
8		The report states: Fugitive VOC emissions from pipeline segments are generally not included in the NEI. (well, are they an important source that should be included?)	Included a recommendation that pipeline emissions be evaluated based on 2016 GHGRP data (yet to be released) and be considered for addition to the NEI.
9		Figure 7 – Please provide units on y axis.	added units to this figure
10		Figure 8 – left panel – some portion of nox emissions from PA sources are resulting from state reporting. There are clearly problems with this figure.	Thank you for catching this. Certain non-default O&G SCC's were omitted from this Figure; we have updated the Figure and it now shows a higher fraction of emissions from state reporting for PA.
11		All figure – should indicate the year of the data in the title.	Added the data year to each figure caption.
12		Figure 11 – I see from the note that color coding of the stacked bars	Given the number of basins, it is not practical to include a list of basins as a legend on

Comments from Julie McDill (MARAMA), dated 12/22/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		represents basins, but what basins correspond to what colors? It is confusing that one color seems to represent multiple different basins depending on what state you are in. Also, the asterisk indicates state used tool defaults, but in the case of PA the NEI does not represent default tool calculations. We adjusted defaults based on state information and then ran the tool twice so that we could estimate both conventional and unconventional wells	this figure. We have referenced basin level data available as an appendix.
13		Engine Emission Factors: Good analysis of the engine emission factors. I think it shows that we are overestimating NOX because of improvements made as a result of recent RICE rules. The idea to use of the nonroad model would be a good one, except NONROAD is in severe need of updating and also does not correctly address reductions from turnover and new regulations. We should not try to replicate NONROAD, however. Perhaps the best suggestion is to use the tool to estimate activity and then use nonroad to project emissions. Coordination with OTAQ would be necessary to address this properly and efficiently.	Noted.

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
1		Page 3, Table 2: it would probably make more sense to add the point source and area source emissions, and then calculate overall factors per amount of gas production (instead of calculating factors based only on point source emissions.	Removed the column with lb/MMSCF emission factors.
2		Page 8, Table 3: not sure it is obvious that the Texas reporting thresholds vary by county based on ozone attainment status. Adding a footnote might make it clearer	Added footnote for clarification.
3		Page 12, suggestion 1: the issue is determining exactly how much of the midstream sector is accounted for in the point source and area source inventories. It is agreed that gap filling missing midstream emissions is important, but we just don't know if there is any way to determine how much is missing.	Agreed, added additional discussion on midstream emissions included as non-point sources.
4		Page 16, Figure 9: It appears odd that the amount of S/L/T reported crude oil tank VOC emissions was not higher in	Added emissions from this SCC to Figure 9

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		comparison to the EPA tool reported emissions (like it is on the other sources). Double checking Texas' 2014 area source crude oil storage tank VOC emissions, it looks like those emissions (around 382,000 tpy VOC emissions) were not included in this figure. Looking back at Figure 8 on page 15, it looks like these emissions were also left out here, since Texas' 2014 total statewide area source oil and gas VOC emissions should be around 1,060,000 tpy. [note: Texas reports crude oil storage tank emissions under a different SCC than the EPA tool, code 2310011020. Texas chose this code before the EPA tool was developed, and has continued to use the code for emissions trends purposes.]	
5		Page 17, defining a gas well versus an oil well: the memo indicates that the EPA O&G Tool definition is consistent with the statutory definition for Texas (e.g., a well is an oil well if the GOR is less than 100 MCF per barrel, and a gas well if the GOR is greater than 100 MCF per barrel). While this is true, the Railroad Commission of Texas (RRC) has additional criteria, and will classify wells with a GOR between 12.5 - 100 MCF per barrel as gas wells if the API gravity of the liquid is greater than 50 degrees (while the EPA tool would classify these wells as oil wells). When ERG originally assigned well types based on the 100 MCF per barrel level, about 10% of Texas' gas wells were reclassified as oil wells, and about 95% of the statewide condensate production was reclassified as crude oil production.	Removed reference to Texas well type definition.
6		Page 21, GHGRP Subpart W data: for several oil and gas source types, basin-specific equipment counts and operating parameters have been developed from EPA Greenhouse Gas Reporting Program (GHGRP) data. Texas agrees that in basins where a limited number of operators provided data, the resulting basin-specific factors should be reviewed to ensure they are appropriate and representative of all sources in those basins. It is also agreed that using a nationwide average for basins where no data was provided may not be appropriate. For example, for pneumatic devices, it looks like that the data from the Permian Basin is skewing the	Added text with the suggestion that for basins where no data was reported, another option for assigning factors is to use data from adjacent basins or to combine data from adjacent basins.

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		number of devices per well to be too low (since the majority of basins have between 2 and 3 devices per well while the Permian Basin has less than one device per well; and the nationwide average is around 1.5). It may be better to use data from adjacent basins to develop factors for basins where no data was reported, or to combine data from adjacent basins.	
7		Page 48, Figure 33: It looked strange for Texas, that this figure indicated the benzene to VOC ratio was zero for Texas. Looking into it in more detail, for the majority of the state, the default of 0.0133 is used. Only for the Anadarko Basin is the factor nearly zero (0.0002).	That is correct. The chart shows the non-default value of 0.0133 and indicates that there is only one non-default value (0.0002).
8		Environ's recommendations for point source improvements (page 12), with Texas' comments in **bold**: 1. Gap fill missing midstream O&G point source emissions. Analysis of point source emissions from states with robust reporting programs could inform the development of a gap filling methodology. Gap filling may also increase the accuracy of other aspects of the point source emissions inventory such as point source emissions from natural gas transmission and distribution sectors. High priority. **We agree with this recommendation; however, as noted above, it will be difficult to do.** 2. Distinguish emissions by sector to facilitate inventory analysis with respect to sector specific requirements, transparent point-nonpoint emission inventory reconciliations, and more accurate future year forecasts. Medium priority**. It would make the analysis easier; but recommend that this be rated as a low priority though.** 3. Enhance the synergies between NEI and Subpart W emission inventories by unifying facility and unit level identification or making available cross reference identification in ancillary files released with the NEI. This would allow for evaluating consistency in the facilities	We appreciate these detailed comments on the point source recommendations. We have revised recommendation #2 to low priority. We have also added text clarifying that consistency between the NEI and Subpart W is not possible for the upstream sector for which Subpart W reporting at the basin level by each operator. We have also added text in the body of the report indicating that reporting of pipeline emissions as area and/or point sources would depend on the data that will be available from Subpart W. We have clarified the recommendation for Control_ID.

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		reported in each database (and gap identification) and aid in understanding the consistency between and extent of emissions control in both databases. Low priority. **Since the GHGRP data for upstream oil and gas is typically reported at the basin level and not the site level, I think this would be difficult.** 4. Release of ancillary GHGRP pipeline data (pipeline length, pigging frequency, etc.) by EPA could allow for CAP and HAP emission estimation. Consider potential analysis of GHGRP pipeline emissions (reporting required from regulatory year 2016) for developing CAP and HAP emissions that may be incorporated into the 2017 NEI. Medium priority. **Agree with this recommendation; would the emissions be reported as point source or area source emissions for the 2017 NEI?** 5. Clarify the completeness of the Control_ID field in the NEI point source database by including distinctions between empty (null) fields and sources with no control. Add capture efficiency and control efficiency to NEI and GHGRP reporting requirements. Medium priority. **Although w**e **agree it would make the analysis easier; we recommend that this as a low priority.**	
9		Environ's recommendations for area source improvements (page 12), with my comments in **bold**: 1. Oil and gas well type definitions differ between GHGRP Subpart W, NSPS OOOO, EPA O&G Tool, and state reporting requirements. EPA should confer with S/L/T agencies to determine whether a single well type definition to distinguish oil and gas wells as implemented in the current EPA O&G Tool is appropriate or whether state-by-state definitions should be included in the Tool. High priority. **I agree that this should be looked into. For**	We appreciate these detailed comments on the nonpoint source recommendations. We have added text indicating that the largest production basins should be prioritized for update and that state regulations expected to have the largest impacts on emissions should be prioritized for inclusion in the future year forecasts.

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		Texas, I submitted revisions for the EPA tool, to use the RRC's determinations for gas wells versus oil wells and condensate versus crude oil production. This resulted in about 10% of the wells being shifted back to gas wells and about 95% of the condensate being shifted back to condensate. Since the number of gas wells impacts the compressor engine emissions (which are the largest source of NOx emissions) and the factor for condensate storage tanks is larger than for crude oil (and is the third largest source of VOC emissions), it is important to determine how these should be classified in the EPA tool. 2. Gas production data in the state of Colorado includes production of CO2 gas from the McElmo Dome formation. The emission regime for the production of CO2 gas is not expected to be consistent with the emission regime from natural gas wells and should be excluded from the EPA O&G Tool and should be removed from the Tool. High priority. **Doesn't impact Texas; but I agree with the recommendation.** 3. GHGRP Subpart W data incorporated into the EPA O&G Tool should be analyzed to determine whether it is based on a sample that can be considered representative for each O&G basin. We have noted that inputs for several basins are based on GHGRP Subpart W data from a single operator. High priority. **We agree with this recommendation; please see the comments provided above.** 4. GHGRP Subpart W data is available for fugitive devices, pneumatic pumps, and compressor engines. This data should be used for high level checks of current default estimates included in the Tool. Medium priority. **We agree with this recommendation, assuming the oil well versus gas well issue can be resolved and/or accounted**	

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		for. 5. Default and dated input factors are being used for key basin factors and gas composition factors in many basins. For some basins, default or dated input factors may be in use because there is no better data available. In other basins, default or dated input factors input factors may be in use because resources have not been available to develop input factors that are consistent with the latest S/L/T agency inventory compilations. Making updates to default and dated emission factors is critical for developing accurate oil and gas well-site emissions. Even though some S/L/T agencies have provided input factors for several source categories and GHGRP Subpart W data has been incorporated into the Tool for several source categories, there are still many input factors that cannot be considered representative of well-site equipment in each basin. The lack of representative input factors in the Tool is not unexpected considering the complexity of estimating well-site emissions across all basins in the United States in a single tool (separate modules for exploration and production emissions). The strategy to continue enhancing the currency and accuracy of input factors in the EPA O&G Tool is critical. High priority. **I agree that this is an important goal. However, since a lot of the basins that use default data have low production and emissions and are located in states where S/L/T's don't have the resources to make updates, it may not be possible to update all of the default data. The basins with the largest production and emissions should be prioritized.** 6. Drill rig and hydraulic fracturing pump diesel engine emission factors and artificial lift, wellhead compressor, and lateral compressor natural gas reciprocating engine emission factors are expected to decrease over time due	

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		to federal regulations and should be considered for update. Medium priority. **It would be great to be able to determine how much emissions will decrease over time due to regulations. However, it is difficult to accurately determine the population of engines over time that the regulations are applicable to, and it is difficult to know what the rule effectiveness is. Since the comparison of top-down inventories to bottom-up inventories almost universally indicate that the bottom-up inventories are too low, we don't know if it is worth the time and effort to try to quantify reductions due to regulations. It may be more conservative to take no reductions.** 7. In previous EPA modelling platforms, state O&G regulations have not been accounted for. The effects of emission control due to both state and federal programs should be accounted for in forecast year inventories. Medium priority. **Again, hard to quantify accurately, especially over time as the amount of controls is expected to increase. It may make more sense to account for only regulations that are expected to have a significant impact.** 8. Add emissions to the NEI for four emission source categories (injection pump blowdowns, hydrocarbon liquids dissolved CO2, well testing venting and flaring, acid gas removal units) that are included in GHGRP reporting for well-sites, but not included in the NEI. Low priority. **Will emissions be added based on the amount of methane emissions reported to the GHGRP, based on a ratio of methane to VOC? If so, then a methodology will have to be developed to allocate the basin-wide emissions to individual counties. Or will factors be developed instead for these sources, and combined with some sort of area source activity data to estimate the**	

Comments from Kathy Pendleton (Texas Commission on Environmental Quality), dated 12//2016			
No.	**Page**	**Reviewers Comment**	**Response**
		emissions?	
10	17	In an email dated 1/27/2017 from Michael Ege (TCEQ) to the Oil and Gas Committee, detailed information on how differences in well type between HPDI and Texas Railroad Commission (RRC) lead to substantial differences in oil and gas activity estimates based on HPDI and RRC.	Noted.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
1	1	It would be helpful to define here the problem(s) and their relative significance to a set of desired outcomes that this memo intends to address.	We have reorganized the introduction.
2	1	Purpose of memo is stated as... - evaluate the 2014 (NEI) (v1) to enhance understanding of the representativeness and completeness of the data used in the national (O&G) inventory and to prioritize national data needs. - describe and analyze available national O&G inventory input sources to support: * future NEI reporting efforts and * top-down assessment of the completeness and representativeness of **GHG data** from this sector - prioritize and recommend which input data sources could be improved to enhance inventory accuracy.	Noted
3	2	Why is the point source analysis focus on midstream? What is the hypothesis?... That those emission from those processes are not well characterized or... That better distinction is needed about which processes produce what amount of the emissions? or.. Something else?	The scope of our analysis focused on upstream and midstream sources (Production and Processing Subsector). We have revised our discussion of O&G point sources based on this comment and other comments received on this subject.
4	2	The NAICS code is one way to identify the industry, but the NEI doesn't rely on NAICS codes for its distinctions. It relies on SCCs because it is the polluting equipment in each segment that is important. Furthermore, if the reporting industry itself does not report the 6 digit NAICS then a distinction by NAICS cannot be done. But again, this distinction by NAICS is not the issue. Please refer to SCCs 306001 to 30699 for example, for some of the sources of oil and gas emissions, noting that some types of equipment can be used in many segments. Also codes 309900 and so forth. Also, were the distinction to be done by SCCs, the authors would be assuming that all emissions were reported correctly to the	See response to EPA Comment #3.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		relevant SCCs.	
5	2	Yes the NAICS code is not sufficient descriptor by itself for this. EPA assigns to the point source inventory, for facilities with the largest CAP emissions - a 'Facility Type', to help further distinguish the predominant type of facility. The addition/ use of Facility Type for this analysis may help improve understanding of the source type.	Good point, we will note facility type as another option for distinguishing source type.
6	2	Which are these different regulatory requirements? Do you mean reporting requirements for NEI or do you mean other air quality rules?	Reporting requirements under Subpart W - revised.
7	2	The NEI point source inventory includes 'Regulatory Type' - assigned at the process level. EPA currently assigns Regulatory Type and I believe that the CAER project intends to ensure a more complete assignment in collaboration with regulated entities that will report emissions information to the EPA. Ron Ryan, Marc H, and/or Josh D will know more on this.	Noted
8	2	2014 NEI v1	Added reference
9	2	? those that are indicated in the Table 1 national totals?	Yes, national totals – added text.
10	2	The S/L/T survey is not described. I presume the Table 2 is a result of on-line queries of State Energy Dept. sites? Reference? Is it assumed that the state production numbers given in Table 2 include transmission?	Included additional discussion of the survey.
11	3	Or more/ as likely... that the majority of the State O&G emissions in the NEI are represented as nonpoint source.	We have added discussion on the extent of S/L/T O&G midstream emissions that are included in the non-point inventory.
12	3	Is this a regression? If so, then please state the equation and the theoretical framework to back it up. If this is a correlation coefficient, please state so. An appropriate measure of the variability would be the standard deviation.	Removed regression figure.
13	3	Not sure all of these factors are substantiated in what I have read thus far, or maybe not teased out in a way that I can comprehend. Does the natural gas production in a state always include amounts that move through the gathering and transmission processes? There is a disconnect with the nonpoint source emissions which typically represent the majority state emissions as characterized in the NEI.	See response to EPA comment #11. Revised wording to reflect that these are possible causes.
14	3	?.. may be expected, due to several factors: Also looking at it this way, trying to relate NAICS-level production activity to NAICS affiliated emissions as reported in the point NEI, should also recognize as a factor that the majority of emissions in the NEI for most states are in the nonpoint sources.	See response to EPA comment #11.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
15	5	It would be helpful to indicate for Fig 3 and here that these are SCC, process-level emission summaries. This being a departure from the previous NAICS, facility level emissions summaries.	We provided a description in the paragraph above this figure on its compilation.
16	5	Getting states to participate in reporting to the NEI the control information has been and continues to be difficult. The recent collaboration via the MJOs to help states add and correct (non-EGU point) control information in the NEI may have captured additional controls for these type sources.	Noted.
17	6	My understanding is that capture effic and control effic is required to be included if control approach is reported. If the S/Ls will validate and describe the presence of an active control system, that would bring along with it the capture efficiency and control efficiency.	Revised
18	6	Please define what you mean by "screening analysis" and provide a reference for the method used.	Method described in the document in the following sentence.
19	6	Again, NAICS and SCCs are not the same, NAICS lack the capability to make a detailed distinction among types of units and processes, which they aren't designed to do. If the state reporting is not providing the relevant SCC information in the relevant point or nonpoint category, a reconciliation is difficult. Furthermore, the authors are requesting a better means of identifying the oil and gas segments but don't propose anything specific, which would be very helpful.	See response to EPA Comment #3.
20	7	I think that Wyoming issues an enormous number of permits for O&G emissions producing activities, which I think might represent (not sure) the bulk of WY's emissions, and which I think they still report to the NEI as nonpoint sources - - if so, would question the first sentence. Does the first sentence mean that the O&G Tool characterization of nonpoint emissions is a flaw? Presuming that as the punchline here... it would be helpful if the assumed *flaws* (e.g. in npt emissions characterization) were stated up-front with better indication of what is trying to be solved, to benefit whom. Stated up front was (.. to enhance representativeness and completeness of the data used in the national (O&G) inventory). Thus far there is no inclusion of nonpoint emissions in the analysis of completeness.	Clarified that there are O&G facilities which are reported to states as point sources, but included as nonpoint sources in the NEI. Added discussion of lateral compressor engines included in the Tool.
21	9	Ultimately, the extent to which all emissions were accounted for in the inventory is not just a matter of how many sources were included, but whether they were reported to the correct SCCs. While a state may have made every attempt to capture all sources completely, the real universe of emissions may not be truly known.	Good point, noted this in document.
22	11	A key for relating between databases is likely a common facility configuration. I believe this a goal of the CAER project.	Noted and added to the document.
23	11	It seems that a first-order reference is to facility configuration and respective emissions for a common configuration and subsequent determination of whether pipeline emissions are accounted for at all in the NEI (elsewhere, i.e., in the nonpoint portion?).	Our understanding is that gathering pipeline emissions are generally missing from the NEI since they are not captured in state point source reporting or nonpoint production site inventories.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
24	11	Where EIS ID and eGRT # can be determined to be the same facility and represent the same units - it would be interesting to compare what control information resides in FLIGHT for that facility with what resides in EIS for that facility.	Agreed, this type of analysis may be performed in the Task 2 regional analyses.
25	12	Is this true or is there a control assumption forecast that attempts to estimate modified sources in the future?	We are not aware of such a forecast.
26	12	There is no recommendation for how to determine where state regulatory/ control information is significant; nor how to improve and reduce the complexities of transferring relevant and significant state regulatory information to EPA tools and processes. Was that an oversight? Or a reflection of an intractable difficulty?	We feel that it is outside of the scope of this project
27	12	Is it that the midstream emissions are not or under-represented in the state's point source submissions to the NEI AND that they are absent from the O&G nonpoint emissions? If so that should be stated up front under purpose, problem definition, and desired outcome(s). Midstream facilities include compressor stations, gas plants, and other sources that are downstream of well production facilities and upstream of natural gas transmission and distribution sources.	Yes This follows on from S/L/T agency survey results and other discussion in this section. Agreed.
28	12	The authors have identified the gap they believe is missing by referring to NAICS instead of SCCs. The authors also do not propose a better approach to dealing with what they have stated is a gap of information.	We feel that it is outside of the scope of this project
29	12	Do specific requirements mean... regulations? Is the existing NEI point source field 'Regulatory Type' relevant here? Be more specific and describe the expected improvement and benefit and how it relates to the objectives stated up front.	Removed “requirements” Added sentence.
30	12	This is being addressed under the CAER project.	Noted and added.
31	12	Previous section that identified available GHRP pipeline data would benefit from adding an example of how specific available information can: 1) identify extent to which pipeline emissions are absent in the NEI; and 2) aid in estimating CAP and HAP emissions for the NEI that are presumed missing.	We feel that it is outside of the scope of this project
32	12	The AERR point included (conditional) requirements for reporting these data to the NEI.	Noted.
33	13	I think emissions from what is referred to in the previous pt source analysis as midstream sector emissions - are not characterized by the nonpoint tool. Is that correct? Would be helpful to state that here as well as up-front with a problem definition.	See response to EPA comment #11.
34	14	Better input data for our tools is always welcome so long as it relies on defensible scientific and	We feel that it is outside of the scope of this project

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		observational sources which states are best suited to provide but are not always able to. Any suggestions as to how to avail the inventory staff of better data are welcome.	
35	14	Suggestions for where to find better data would be appreciated. It is not clear how the authors qualify S/L/T data versus data from the Tool. For example, are they saying S/L/T data is always more correct?	We feel that it is outside of the scope of this project We are saying that O&G Tool input updates should prioritize states for which O&G nonpoint emissions are based on the O&G Tool.
36	17	For projections work, could any of these data sources help allocate EIA AEO's oil and gas production forecast for future years more specifically to related SCCs and VOC, NOx emissions?	We feel that it is outside of the scope of this project
37	18	Are CO2 production areas typically included in the AEO production forecasts? Does this mean that inclusion of such areas in production activity can cause an over-estimate of VOC emissions? How significant is that? Should representative gas production from such areas be deducted if possible? How would that be done?	Per information on the January O&G Committee call, CO2 production is being removed from the O&G Tool for 2014 NEI v2. We noted that in Colorado there were substantial increases in NEI 2014 v1 gas production due to CO2 gas production. We have not performed a detailed analysis of emissions from CO2 production or the extent to which CO2 production is included in the AEO.
38	21	It would be useful to include here an example of *how* these different information sources could be used to adjust / improve the default activity basis applied in the O&G Tool.	We feel that it is outside of the scope of this project
39	21	Agreed. EPA would appreciate any input on how the "large" sources reporting to Subpart W are similar or different in terms of emissions factors and activity data than "smaller" nonpoint sources.	Noted
40	23	What would be better data sources for these?	We feel that it is outside of the scope of this project
41	23	Would you refer the reader to where or what those suggestions are? Do you mean a reference to updates made above? Which data sources should EPA be using?	Added a reference to input factor analysis sections below. We have not made a recommendation regarding new data sources.
42	24	The State of Wyoming is of course welcome to suggest these and, in fact, may incorporate the values they consider more appropriate to the tool.	Agreed
43	24	Would the authors be able to give a concrete example of where they think this is not being considered? That would be very helpful.	Added text on the subject of pre-2010 basis of many input factors from CENSARA (2012) study.
44	24	Is that the allocation of production data shown in Table 7?, i.e., reference/ confirm the original source.	As noted in the Figure 11 title, this data is from the O&G Tool.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
45	26	What is the goal of this section? Is the data in the graphs from the tool, or other sources? What point is being made and what is your suggestion for next steps?	The point is to give the reader information about the type of generalized default inputs that are used in the O&G Tool and the range of non-default values. We have added a reference to the data source in the Figure title.
46	54	We rely on states to give us this kind of information where relevant, during monthly calls. We are happy to incorporate any new data that is considered better and more appropriate for the tool.	Agreed
47	55	Given the previous discussion on pages 11, 12 re inherent complexities of reducing state control information to relevant useful data, it would be helpful here to provide suggestions to solve the problem, i.e., what need to happen by whom.... or say it can't be solved?	We feel that it is outside of the scope of this project
48	55	The cutoff is a percentage of production of oil/gas as defined by the GHGRP.	Agreed
49	56	If the data is not representative, which data or approach should EPA be using instead?	We feel that it is outside of the scope of this project
50	56	A list of regulations you believe are missing from the tool would be very helpful.	We are not suggesting that regulations are missing from the Tool. We are suggesting that regulations are missing from future year inventory forecasts (e.g. Colorado Regulation 7 and Wyoming Permitting Guidance)
51	A-1	Original data source?	We have referenced the O&G Tool.
52	1	It was a hard read for me maybe because there is not a strong problem definition upfront with description of relative significance and for whom. It seemed to just 'jump in'. If the audience is to include inventory preparers and data users who are not steeped in the intricacies of the existing O&G estimation methods, then it will probably be a difficult read.	We have made adjustments to the introduction and other sections to improve clarity.
53	1	I feel like this whole paragraph is 3 different ideas--what is the focus of the document?	This is background information. We moved the third paragraph up to clarify focus.
54	1	Is the focus of this really GHG control programs? The NEI isn't GHG focused.	See response to EPA comment #53.
55	1	Why did you not use SCCs? Some discussion here (for folks who are familiar with the NEI) would be very useful.	See response to EPA comment #4 above.
56	1	The NEI includes source classification codes (SCCs) that allow this distinction. This recommendation seems based on a shortcut taken to use facility-total data that included only NAICS codes rather than the larger and more complex process-level data that includes both NAICS and SCCs. Thus the top of the first paragraph on page 3 that speculates about the possible source for high estimates per unit of gas production could have more information to give a better answer.	See response to EPA comment #4 above.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		- In addition, it is not clear what "functionality" means in this context. The NEI is data and data doesn't really have "functionality". Is this in reference to the nonpoint O&G tool, and if so, why would this recommendation show up in the point sources section?	Removed "functionality"
57	4	- it isn't clear whether the emission types (flare, process heaters, engines, etc.) about the sources from Figures 2 and 3 are detailed from the NEI or from another source of information. It should be made clear where that information comes from (could be SCC or NEI unit types). Presumably this is from the NEI. Irrespective of the origin, it's not clear why the analysis/recommendation from page 2 could not also have taken a more detailed look than NAICS codes.	Added note that these descriptions are based on SCC cross-references. Point is to document that a vast majority of emissions are from compressor engines.
58	5	add "as point sources"	Revised as follows: "fugitive VOC emissions from **gathering and transmissions** pipeline segments are generally not included in the NEI **as point or nonpoint sources**"
59	5	- the footnote 3 as a reference on page 5 for the definition of control efficiency should be the Air Emissions Reporting Rule. See HYPERLINK "http://www.ecfr.gov/cgi-bin/text-idx?SID=4719db7a48cd26050b0732d0f9adc3ad&mc=true&node=pt40.2.51&rgn=div5" \l "se40.2.51_150" http://www.ecfr.gov/cgi-bin/text-idx?SID=4719db7a48cd26050b0732d0f9adc3ad&mc=true&node=pt40.2.51&rgn=div5#se40.2.51_150 (and the term used in the NEI is "percent control measures reduction efficiency). The current use of the definition from an Oklahoma website suggests that the Oklahoma website would determine what other states are supposed to report to the EPA for the NEI, which is clearly not the case.	Revised text to use the federal definition:
60	5	- Control and capture efficiencies are already required by the AERR (for the NEI) where they are present. We are not able to enforce the requirement in the submissions from the state because not all processes are controlled. See Table 2a of Appendix A of 40 CFR 51 (HYPERLINK "http://www.ecfr.gov/cgi-bin/text-idx?SID=4719db7a48cd26050b0732d0f9adc3ad&mc=true&node=pt40.2.51&rgn=div5" \l "ap40.2.51_150.a" http://www.ecfr.gov/cgi-bin/text-idx?SID=4719db7a48cd26050b0732d0f9adc3ad&mc=true&node=pt40.2.51&rgn=div5#ap40.2.51_150.a). In addition, it is not immediately clear how a requirement for the GHGRP would impact the information submitted by the state for NEI for point sources, however, I agree that having the control information in GHGRP would help with nonpoint estimates of the fraction of units in a particular area that are controlled or not.	Good point, removed text indicating that capture efficiency isn't required to be reported.
61	6	It's not clear based on the NAICS-based analysis mentioned earlier that the analysis of the NEI considered the additional details available in the NEI to better identify the type of sources. In addition, there isn't much value in simply making such a comment. What would be valuable would be to identify	Revised text to indicate that we are not stating that these sources are likely to be double counted.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		shortcomings in SCCs, unit types, or other things where adding those details (well-site, midstream, etc.) would be needed. Furthermore, given that the maximum double counting would be 7.2% of VOC in 1 state (where we know that we aren't double counting) and 1.6% in other states, it's not really all that important even to avoid double counting. Finally, the states are responsible for avoiding double counting, and we expect that largely they do this when compiling their point and nonpoint estimates. To the extent that states need better tools for nonpoint sources, more specific comments than these high level ones would be helpful.	
62	9	The conclusion of "potential under prediction of emissions up to 50%" is completely unsubstantiated and is contradicted by the report's own statements. Just because some states voluntarily report point sources at a smaller size threshold, this does not mean that other states emissions are potentially under predicted. As the report indicates, the permitting and reporting requirements are different in each state. The purpose of nonpoint sources in the NEI is to capture all remaining emissions from sources that are not reported as point sources, and the paragraph and prior text provides no evidence that emissions are not being reported. This statement should be removed unless it can be justified, which we do not expect is possible once nonpoint emissions are factored into the analysis.	Removed "up to 50%". Added discussion indicating that, theoretically, nonpoint emissions should capture all remaining sources, noting potential areas where point and nonpoint source emissions are generally missing from the NEI.
63	11	- the statement "Beginning in 2016, gathering and boosting facilities and pipeline reporting will begin under GHGRP" should be changed to the past tense: rather than "will begin" it should be "has begun". If clarifications are needed to indicate that this information was not yet available for the 2014 inventory year, then those should be added.	Revised.
64	11	- Previously in the report, a recommendation was made on page 6 to add control efficiencies collection to the GHGRP. On Page 11, the report indicates that FLIGHT has information on "control levels," and the wording of "levels" suggests more information is available (perhaps such as efficiency) than simply the control types. Page 11 also lists controls that are collected by the GHGRP. If the GHGRP is just collecting control types, then the word "levels" shouldn't be used. If the GHGRP is collecting more than just types, then additional clarification should be added in the initial recommendation as to which additional controls information would be useful from GHGRP and why that information would be useful for NEI purposes.	Removed "levels"
65	11	- we agree with the statements made on the difficulty of forecasting of O&G emissions sources; however, there really is no analysis provided in this section and so other than restating the obvious regarding the difficulty of forecasting emissions. It's therefore unclear what value the section has. If the section remains, it could include that the EPA has recently updated its O&G projection method to attempt to account for the impacts of NSPS.	Added note regarding EPA NSPS impacts update.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
66	12	How has the conclusion been reached that there are missing midstream point source emissions without an analysis of nonpoint sources? It seems that this conclusion has been reached based on the information provided on pages 9 and 10, and as noted above, this analysis seems invalid. If indeed there is real evidence that there are missing emissions, the report would be much more valuable if it included: (1) why it is certain that these emissions are not included in the nonpoint category, (2) what are the specific processes that are thought to be missing (by SCC).	See response to EPA comment #62.
67	12	It isn't clear what is meant by "distinguish emissions by sector". A more clear definition of "sector" would be needed.	See response to EPA comment #3.
68	12	With regard to the recommendation for "transparent point-nonpoint emission inventory reconciliations", there are several issues: (1) the report hasn't provided any evidence that the approach isn't already transparent, (2) there is a reconciliation approach that has been taken which is documented in the recently released TSD, (3) if there are improvements needed in transparency, the report should include an actual analysis of that aspect prior to making this recommendation and give specifics about what is insufficiently transparent. With regard to the recommendation for "more accurate future year forecasts", there is no evidence provided that our forecasts are not "accurate". This would require a comparison of our forecasts to actual occurrences in the future, which cannot be done because those years haven't happened yet. As noted above, there is nothing provided in the report that does more than say future years are difficult to predict, and so this recommendation should be removed unless more specific concerns can be identified or recommendations can be made.	Revised this recommendation
69	12	This is a good idea and it's something that we are working on as part of the Combined Air Emissions Reporting (CAER) project.	Noted in report.
70	12	This "release" part of this recommendation is silly as the EPA already has every intention of releasing the information. As noted in the report, the information just started getting collected in 2016 and so it hasn't been possible to release and use was hasn't been available to date. We agree with the second part of the recommendation.	Revised to "Planned future release"
71	12	A more specific recommendation would be to add a control type of "uncontrolled" for states to use in reporting their facility inventory data. This would allow us to be able to distinguish between not reported and uncontrolled. For the second part of this recommendation, the NEI reporting requirements already include the requirement being recommended, and so that part of the recommendation should be removed. Since it's already required for NEI, the report could give more information about what types of sources are included in GHGRP reporting that are not usually reported as point sources, for which adding the capture and control efficiencies would be useful.	Good point, we have added this. Removed this part of the recommendation.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
72	13	This sentence needs cleaning up.	Revised
73	13	Could also be from HAP or PM augmentation.	Good point, added.
74	13	this wording is awkward, and not necessarily true. "one, several, all"	Revised
75	13	I've passed this document on to Melissa Weitz for her review, but I don't think that GHG emissions are divided between point and nonpoint, so you may want to rewrite this.	Revised
76	13	categories.	Revised
77	13	not covered in subpart W, but are covered in other parts of the GHGRP	Thank you, added footnote.
78	13	not sure, but think acid gas removal units may be in point inventory	Added footnote
79	14	I'm not sure what this means. We don't limit updating inputs to states with CAP emissions from the O&G tool.	Removed this sentence
80	17	This sentence/point seems randomly placed. What is the significance of needing tribal versus nontribal jurisdictions?	Regulation and management of O&G sources in non-tribal portions of counties are separate from the same kinds of activities for the same O&G sources on tribal reservations within the same county, where EPA works with and/or on behalf of the tribe. Tribes are sovereign and states have no authority over sources on tribal lands, see the EPA Tribal Authority Rule. States have separate and additional regulations and tracking requirements beyond those of EPA for sources on non-tribal lands. If a state and tribe/EPA both want to manage and regulate sources in the same Basin, the inventory for that county(ies) must distinguish between the non-point emissions on tribal and non-tribal lands, in this case for O&G sources. The current non-point county total inventory approach does not allow differential tracking of point and non-point sources on tribal and non-tribal lands.
81	17	misspelling HPDI	Revised
82	17	need to fix all references that misspell HPDI (I see more than these that I marked)	Revised
83	21	If this is a recommendation, suggest adding it to the recommendation section. However, differences were chalked up to "monthly well counts" which was determined to be more accurate method for determining emissions for the tool, based on committee input. Therefore, our method is superior.	Agreed, will add note that monthly counts are more accurate.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
84	21	It's not "nonpoint" subpart W data--just subpart W data. GHGRP doesn't have point and nonpoint.	Removed “nonpoint”
85	21	Seems reasonable, but if no other operators submit data to subpart W, then it would be difficult to do this. Also, just because a single operator submits data for a basin, why would that make the data less likely to be representative?	Removed text regarding single operator
86	21	Again, if this is a recommendation, please include it in the "recommendations" section.	Added to “recommendations” section
87	21	This sentence is confusing.	Removed
88	21	We've been aware of this and discussed it at national oil and gas committee calls...it's a common concern. Suggestions on how to reconcile would be useful. The age-old question of "which is better, bad data or no data" and its answer, "it depends."	We agree that this this is a difficult issue to resolve, but thought it was important to document.
89	22	not sure why this is mentioned	Background information
90	23	Data is plural, so should read "data are" not "data is"	Revised
91	23	should read "from" not "form"	Revised
92	24	Since WY doesn't use the tool, EPA nor WY have made it a priority to update factors for this state. As resources allow, we will pursue this further.	Noted
93	25	Not sure what value these graphs add. Can you explain?	Background for readers on the data included in the Tool that underlies emission calculations
94	26	These specific comparisons to default--could you spend a little more time getting conclusions that are useful for improving the NEI?	Our intent was to provide an analysis that showed the default and non-default data for various key inputs so that readers could have more information about the inputs upon which emissions are estimated in the O&G Tool.
95	55	nonpoint	Revised
96	55	ERG reviewed the revised methodology with the committee prior to inclusion of the updated data in the 2014 version of the tool. This discussion included a general description of the implications of the changed methodology towards more oil wells (and oil production) and less gas wells (and condensate production). Subsequently, several states have provided updates to activity data in the tool. As requested by individual states, ERG could revise the activity data derived from HPDI using either a) a different GOR value, or b) the “old” methodology used in the 2011 inventory, which was based on the well type designation in HPDI. State-supplied data is preferred.	Revised to reflect previous changes and suggestion for ongoing consideration.
97	55	ERG is removing CO2 gas production (and CO2 wells) from the activity data as part of the current, ongoing HPDI refresh/update.	Noted in text
98	56	Seems reasonable, but if no other operators submit data to subpart W, then it would be difficult to do	Revised consistent with EPA comment #85.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		this. Also, just because a single operator submits data for a basin, why would that make the data less likely to be representative? For the 2014 GHGRP Subpart W data, there is no publicly available data for well counts or production to inform this type of analysis. However, such information will be available for the 2017 inventory as part of the ongoing revisions to the GHGRP Subpart W reporting requirements. The tool currently uses basin-specific GHGRP Subpart W data where available. Where basin-specific data is not available, the tool uses nationally-averaged GHGRP Subpart W data. ERG recommends maintaining this scheme to utilize basin-specific data to the extent possible.	
99	56	grammar note: there "are" no better data available.	Revised
100	56	We agree wholeheartedly. We have been continuing the effort to not only solicit from states better input data, but to align SPECIATE profile updates with the tool. Several states have provided updated input factors which are included in the 2014 tool. As available, EPA agrees that current basin-specific inputs should be used and collection of such data should be a priority for the 2017 inventory.	Noted in text.
101	56	As noted in the memo, fleet age population distributions are needed to determine the average emission factors to reflect the Tier standards for the drill rig and hydraulic fracturing pump engine categories. ERG agrees that one option to address fleet turnover (and the resulting lowering of emission rates due to an increasing percentage of newer engines in the fleet) is to "age" the 2011 fleet mix used to derive the current emission factors by three years to reflect a 2014 fleet year. Likewise, updates to artificial lift and compressor engine emission factors would require information on the distribution of engines by age, along with the regulatory restrictions associated with each engine age/type. Individual states may have such information available.	Agreed
102	56	We consider projections and the inventory to be separate entities. Was this analysis also on projections? The tool and the inventory are not forecasts.	Limited applicability to forecasts
103	56	As the GHGRP does not address criteria pollutants or HAPs, scaling factors (or gas composition) will be required to convert the GHGRP estimates to pollutants covered by the NEI. Based on GHGRP data reported for 2015, it does not appear these will be significant criteria pollutant emissions sources as compared to the source types currently included in the inventory. It would be helpful if the report included an estimate of how significant a source of VOC and/or NOx that these sources are. If degree of importance of these sources (whether small or large) should be included in the recommendation.	Added caveat
104	3	Seems like it would be helpful to also include nonpoint oil and gas emissions in this table	We only included point sources in this figure since non-point emissions do not contain substantial emissions from the midstream sector. We also

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
			added discussion of the extent to which midstream emissions are included in the nonpoint sector.
105	7	"state agency staff" numerous states or which states?	OKDEQ staff noted in text
106	2	What kind of additional functionality to you suggest here? More detailed NAICS codes, more NAICS codes in general or more SCC codes?	See response to EPA comment #3.
107	6	SCCs usually 8 chars long = point and 10 chars long = nonpoint; are you suggesting more detailed NAICS again?	See response to EPA comment #3.
108	8	Perhaps maps of these thresholds would reveal something useful?	Agreed, but not included in this memo.
109	12	We cannot tell at this time whether sources are known to be uncontrolled or whether the data submitter just hasn't reported controls. Perhaps there is some way to make this clearer during EIS submissions.	Agreed
110	13	add NEI2011v2 too if possible?	We feel this is outside of the project scope
111	14	what kind of updates are we talking about here?	Clarified that we are referring to basin factor inputs.
112	17	This is the only place in the doc where CBM wells are mentioned. What is the purpose of mentioning them? What states is this type of well relevant?	This is background information on well classification. CBM well activity is provided in the O&G Tool.
113	11	Text: "It is beyond the scope of this analysis to conduct a detailed analysis of facility level controls specified in the GHGRP. The types of information available from FLIGHT pertaining to existing emission control levels are as follows: • Flare stack greenhouse gas (GHG) emissions • Dehydrator control types • Reciprocating compressor engine fugitive leaks control • Fugitive leak survey results" Comment: Why were only these categories selected? There is also information on controls at tanks, for wet seals versus dry seals for centrifugal compressors, controls at HF gas well completions and workovers, etc.	Good catch, we have added those source categories.
114	12	Text: "Estimating the effects of NSPS on modified O&G sources has not yet been attempted in a national inventory. Especially for far future years, NSPS effects on modified sources may be significant." Comment: The NEI includes the impacts of modified sources for several categories in that they are represented in the GHGRP data used by NEI. For example, NSPS OOOO requires facilities to replace high bleed pneumatic controllers. Data reported to GHGRP on equipment counts and emissions form high bleed, low bleed and intermittent bleed controls would reflect the effects on modified sources for this category, for the facilities that report to GHGPR.	Clarified that this text refers to sources that would be modified between the base year and future year modeling platform inventories.
115	21	Comment: It would be helpful to be clearer on how the subpart W data were used in the tool. My understanding is that factors of heaters per well, and pneumatic controllers per well, etc. are developed from the GHGRP data and then applied to the well counts in NEI, but that wasn't clear in the text here,	Clarified the Subpart W data estimates that are on a per well basis.

Comments from Jennifer Snyder, Lee Tooly, Tesh Rao, Julia Gamas, Marc Houyoux, Christy Parsons, Melissa Weitz, Jeff Vukovich, Alison Eyth US Environmental Protection Agency, dated 1/6/2016			
No.	**Page**	**Reviewers Comment**	**Response**
		which could be interpreted to mean that the total GHGRP equipment values are used as-is, i.e., with no adjusted for facilities under the threshold.	
116	29	Comment: The GHGI uses GHGRP data for wellhead compressor engines and the NEI tool could consider this update as well.	Noted.
117	44	Comment: The pneumatic controller emissions data from GHGRP is based on GRI emissions factors, so to clarify, GHGRP isn't a new source of data on these efs, though it provides information on operating hours and methane content, which allows for adjustment of these factors to reflect current information.	Added this clarification to the text.
118	n/a	Define "sector" early. Some readers might define "oil & gas" as a "sector", rather than the well-site, midstream, transmission, that seems to be implied in this report.	We have revised delineation of emissions by sector to be consistent with EPA Subpart W.
119	n/a	Note why point source analysis focuses on NOx and VOC (this is understandable, but should be clearly stated). This will make some statements, such as the fact that fugitive VOC emissions from pipelines aren't included in NEI, less out of place (pipeline emissions have other idiosyncrasies that aren't noted here).	Added text on why the focus is NOx and VOC.
120	n/a	Separating out emissions from well-site, midstream, transmission, etc. is discussed as an area of potential improvement (w/comments on the topic pointing the contractor to additional info), but categorizing emissions in oil versus gas is also useful (as noted for nonpt sources).	Good point, this is possible to some extent based on SCC.
121	n/a	Table 3: Consider displaying this information as a map w/ different colors in states that report only Title V vs Title V +. Details on threshold could then be provided separately in a table (or you could use gradient in the Title V+ states to denote those w/ relatively lower vs higher thresholds.	That is a good idea, but beyond the scope of this work.
122	n/a	Suggestion # 4 for point source improvements may not accurately characterize who owns/develops pipeline data (i.e., EPA is unlikely to have pipeline length, pigging frequency, etc.). The EPA Upstream team has been working to characterize crude petroleum pipeline activity using a variety of data sources. We can discuss if that's helpful.	Clarified that we are referring to natural gas pipelines.
123	n/a	The document goals, as stated, don't seem to match what is covered in the document itself. For example, the goals state that GHGs are what is of interest, yet it devotes space to VOC and NOx, which as defined by EPA are criteria pollutants. A sentence or two laying out the structure of the document and the rationale behind it would have helped the reader get more out of what the authors were trying to say.	Clarified that the focus of the analysis is NOx and VOCs.
124	n/a	There seems to be perhaps some information that Ramboll did not consider: a. GHGs, while hugely important per the Endangerment Finding, are not part of the pollutants required to be reported for the NEI. b. The CAER effort, which is public and transparent, is underway to address some of the issues	Noted and added information on these programs where appropriate.

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No.	**Page**	**Reviewers Comment**	**Response**
		outlined here in terms of GHGs but it is not mentioned. – Lee and I had a conversation about this and I saw she has incorporated comments to that effect. c. An effort to align GHGRP, GHGI and the NEI data is also underway and has been for a while. Specifically, I believe on monthly calls we have stated that both GHGI and NEI O&G tool will include as much of the GHGRP data as possible, where appropriate. d. A monthly call and frequent exchanges between EPA and states means states are afforded every opportunity to give EPA feedback on better state data to use in the tool. Provided that the data is defensible and scientifically sound, EPA makes every effort to use it.	
125	n/a	The document mentions a number of results (regression line, screening analysis, for example) but no specifics are provided regarding the method used to generate them and no references are provided. Furthermore, a correlation seems to be confounded with a regression coefficient and the mean is being conflated with, what I think they intend, which is a standard deviation.	Removed regression analysis and added additional information about the screening analysis.
126	n/a	In general, the mention of data and the display of graphs comes without specifics as to the point being made or the reason the information is being raised (e.g. section on Artificial Lifts). This makes it hard for the reader to understand what point the authors are trying to make and incorporate them into our pool of knowledge.	See response to specific comments on this subject above.
127	n/a	NAICS code and process/unit descriptions (SCC codes) seem to be used throughout the document indistinctly. The NAICS are not designed for EPA or EPA emissions inventory purposes so the appropriate code is the SCC, which they don't mention. Specifically, they discuss a gap in midstream oil and gas data but never reference the SCCs they mean. They also do not factor in states misreporting emissions to the wrong code, or to a more generic code than any listed for oil and gas – per the discussion we had in Lee's office.	See response to specific comments on this subject above.
128	n/a	While suggestions are made in general terms, specific new data sources to use are not outlined, nor are any methods. Furthermore, while the authors recognize that the degree to which GHGRP data can be used in the tool depends on how similar or different sources reporting to the GHGRP are to those nonpoint sources in the tool, they do not, for the most part, provide specifics on better sources to use instead. Similarly for the sections where they talk about defaults being used in the tool.	We feel that this is beyond the scope of this study.

Comments from Louise Esjornson, Tom Richardson, and Carrie Schroeder (Oklahoma Department of Environmental Quality), dated 12/30/2016 and 1/20/2017			
No.	**Page**	**Reviewers Comment**	**Response**
1	n/a	OKDEQ staff provided memorandum on the	This is a very interesting analysis and will be useful to other states to

Comments from Louise Esjornson, Tom Richardson, and Carrie Schroeder (Oklahoma Department of Environmental Quality), dated 12/30/2016 and 1/20/2017			
No.	**Page**	**Reviewers Comment**	**Response**
		Subject of "Sensitivity of the 2014 Oil and Gas Emissions Tool to Gas/Oil Classification"	show the impact of well type definition on emissions. We will add this analysis as an appendix to the memorandum.
		OKDEQ staff provided memorandum on the Subject of "Sensitivity of the 2014 Oil and Gas Emissions Tool to Gas/Oil Classification"	Thank you for the thoughtful comments. We have made specific changes to the document per the comments as follows: • Revised subsector definitions to be consistent with Subpart W and added the Figure. • Added discussion of lateral gathering/compression emissions included in the Tool. • Added discussion of fat-tails, and revised the Oklahoma entry in Table 3. The submitted comments memo will be very helpful to inform potential regional analyses under Task 2.