May 26, 2015

Via Electronic Mail and Certified Mail

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Re: Supplemental Comments to May 30, 2014 Comments Submitted to Inform Modernization of the U.S. Bureau of Land Management's 34-Year-Old Rules

Clean Air Task Force is pleased to submit these supplemental comments to the comments submitted on May 30th, 2014 on the matter of methane waste from oil and gas operations on public lands. In those comments, we illustrated the problem of methane waste on public lands based on 2012 data from the Environmental Protection Agency's (EPA's) Greenhouse Gas Reporting Program (GHGRP). We focused this analysis on four Western U.S. oil and gas basins where the majority of oil and gas production is from public land, public mineral estate, or Indian Trust land. As we showed, emissions associated with methane waste in these basins are disproportionately high compared to other U.S. oil and gas producing basins. This waste and the corresponding emissions, as our comments described, can readily be reduced.

Since filing our comments last year, the GHGRP has released emissions data for 2013, and we now supplement our comments with our analysis of the 2013 data.[1] In addition, we provide new information quantifying the portion of oil and gas production in these basins that occurs from Federal mineral estate. This new information documents that production of oil and, particularly, natural gas in these basins is dominated by wells overseen by BLM. Thus, this new information demonstrates the magnitude of waste occurring at wells currently regulated by BLM, and shows the even stronger need for BLM to act to reduce the waste of natural gas from wells producing oil and gas on these lands.

These supplemental comments first summarize our findings and then describe the methodology we used to calculate the figures presented.

I. Analysis of GHGRP data for 2013.

Methane emissions associated with the waste of natural gas are disproportionately large from four high-producing Western U.S. oil and gas basins where the majority of the oil

[1] We note that the May 30, 2014 comments were filed on behalf of over 30 environmental groups. The comments we submit today are only on behalf of Clean Air Task Force.

and gas production is from Federal lands or mineral estate or Indian Trust Land overseen by BLM. As shown in Table 1 below, in 2013 these basins—Green River, Piceance, San Juan, and Uinta—accounted for 30 percent of all the methane emissions reported to the GHGRP from nationwide onshore oil and gas production, while only producing 13 percent of U.S. onshore natural gas and 2 percent of U.S. onshore oil (see Description of Methodology below). As discussed in our comments filed in 2014, the disproportionate emissions in basins dominated by wells overseen by BLM constitutes clear evidence of the waste of natural gas. Technologies are currently available to significantly reduce these wasteful emissions, and are even in place at some facilities. BLM must require operators of all BLM-managed wells to minimize waste at least as effectively as these technologies to ensure that this natural resource, and source of revenue, is not wasted.

TABLE 1

Oil & Gas Producing Basin	Percent of U.S. Gas Production	Percent of U.S. Oil Production	Percentage of Reported U.S. Methane Loss
Green River Basin	5.0%	0.7%	5.4%
Uinta Basin	2.7%	0.3%	4.3%
San Juan Basin	4.1%	0.2%	16.8%
Piceance Basin	1.6%	1.3%	3.1%
Total for 4 Basins	13.4%	2.4%	29.6%

Figures are for 2013. See Description of Methodology for data sources.
* Note: Totals may not sum due to independent rounding.

Furthermore, analysis of 2013 GHGRP data shows that emissions from a number of key sources are similarly disproportionately high in these basins. As shown in Table 3 below, reported emissions from these four basins account for over 54 percent of nationwide reported emissions from liquids unloading, 39 percent of emissions from compressors, and 33 percent of emissions from pneumatic controllers and pumps. Given that these basins produced only 13 percent of U.S. onshore gas and 2 percent of U.S. onshore oil, these emissions are incredibly high.

TABLE 2

Emissions Source	Percentage of National Emissions from four western basins by Emissions Source
Liquids Unloading	54%
Pneumatics	33%
Controllers	34%
Pumps	28%
Compressors	39%
Reciprocating	29%
Centrifugal	41%

Source: See Description of Methodology section.

These disproportionate emissions show that natural gas waste from operations in these basins, including wells and other facilities overseen by BLM, are significantly higher than those represented by standard practices (let alone best practices that actually minimize

waste of natural gas). Thus, it is clear that BLM-managed and -approved operations fail to use all reasonable precautions to prevent such waste.[2]

This is troublesome because measures are available to significantly reduce this waste at reasonable cost to the industry. In our recent report, *Waste Not*,[3] Clean Air Task Force and co-authors used data from EPA, industry reports, and other sources to quantify the portion of emissions that can be avoided from several large sources of oil and gas methane pollution by using identified technologies and practices that are in common use today. All of these technologies and practices were described in our May 30, 2014 comments. As shown in Table 3, these technologies can readily reduce methane emissions associated with natural gas waste from several significant sources, including the sources in the four western basins discussed above with disproportionately high methane emissions / natural gas waste. Further, the potential reductions in wasteful emissions from using these technologies in just these four basins are quite significant – over 18 billion standard cubic feet (BCF) in 2013. In Table 3, we calculate the volume of gas that could be conserved by using these technologies basin-wide in just the four western basins (column 3). By multiplying the volume in column 3 by the portion of production in these basins that occurs

TABLE 3

Emissions Source	Percentage Emissions Reduction from Proven Technologies	Resulting Waste Reduction in Four Western Basins, BCF / year	
		Basin-wide	Scaled to Federal Portion
Liquids Unloading	85% [b]	5.4	4.3
Pneumatics	39%	9.4	7.4
Controllers	37% [b]	8.1	6.4
Pumps	60% [a]	1.4	1.1
Compressors	90%	0.6	0.5
Reciprocating	79% [a]	0.1	0.1
Centrifugal	92% [a]	0.6	0.5
Fugitives/Leaks [c]	60% - 80% [a]	3.1 – 4.1	2.4 – 3.2
Oil Wells [d]	95% [a]	0.2	0.1
Attainable waste reduction (4 basins)		18.7 - 20	14.7 – 15.4

[a] Abatement percentages as reported in *Waste Not*.
[b] Abatement percentages calculated based on emissions data specific to the 4 BLM basins, using same methodology as in *Waste Not*.
[c] Emissions for leaks from production equipment are not measured in the GHGRP. Rather, they are simply inferred from component counts. As a result leak emissions are likely underestimated, perhaps very significantly, by the GHGRP, and therefore potential waste reductions from mitigation of leaks is likely an underestimation.
[d] The figures for oil wells only include methane emissions from venting of associated gas during oil production, and do not include emissions of GHG from flaring associated gas instead of venting it, or emissions from either flaring or venting of gas during oil well completions (the latter are not reported to the GHGRP). As such these figures underestimate oil well emissions, and the benefits of mitigating oil well emissions, significantly.
Note: Waste reductions scaled to reflect the portion of production that is from federally managed wells (see next section). 79% of gas production in these basins is on federally managed lands (used to scale liquids unloading, compressors, and leaks), and 63% of oil production (used to scale oil wells).

[2] 30 U.S.C. § 225.
[3] McCabe, David, et al. (2014) "Waste Not Common Sense Ways to Reduce Methane Pollution from the Oil and Natural Gas Industry." Available at: http://www.catf.us/resources/publications/files/WasteNot.pdf.

from Federal Land / Mineral Estate, we also provide an estimate of the potential volume that could be conserved at wells overseen by BLM (column 4). This is described more fully in the next section.

II. Quantifying the Portion of Oil and Gas in these Basins from Federal Land/Mineral Estate.

In our May 30, 2014 comments, and in the analysis above, we focused on four basins (Green River, Piceance, San Juan, and Uinta) based on the fact that a large percentage of oil and gas production in these basins takes place on Federal lands. However, we did not have data to quantity this percentage when the comments submitted in May 2014 were prepared. We recently obtained data from the Office of Natural Resources Revenue (ONRR) to quantify the portion of oil and gas production in these basins that occurs from Federal resources. ONRR provided royalty data on oil and gas production from Federal minerals in the 26 counties that comprise the Green River, Piceance, San Juan, and Uinta basins.[4] We divided these production figures by data for production from *all* wells in these counties from a commercial database[5] to calculate the percentage of oil and gas production in each basin that occurs from Federally-owned minerals. This calculation is an underestimate of the percentage of production in each basin that occurs from wells overseen by BLM because we were not able to obtain data for production from Indian Trust mineral estate due to confidentiality concerns.[6]

As shown in Table 4, 63 percent of oil and 79 percent of natural gas in the four basins is produced from Federal minerals. With the exception of oil production from the Uinta basin, both oil production and gas production in each basin is dominated (two-thirds or more) by production from Federal minerals. A significant portion of oil production in the Uinta basin occurs on Tribal land, and at least fifty percent of the oil production in that basin occurs from Tribal or Federal wells overseen by BLM.[7] The portion of oil production in the Uinta that occurs from all wells regulated by BLM may well approach two-thirds.[8]

Since such a large portion of production within these basins occurs from Federal minerals, it is clear that a large portion of the wasteful emissions occurring in these basins that we described in our May 2014 comments and the preceding section are occurring on wellpads overseen by BLM.

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[4] US Environmental Protection Agency. Subpart W Basin and County Combinations. Available at: http://www.ccdsupport.com/confluence/display/help/Subpart+W+Basin+and+County+Combinations.
(List of counties: Colorado - Archuleta Delta Garfield Gunnison La Plata Mesa Moffat Pitkin Rio Blanco Routt New Mexico - Cibola Los Alamos McKinley Rio Arriba San Juan Sandoval Valencia Utah - Carbon Daggett Duchesne Uintah Wasatch Wyoming - Albany Carbon Sublette Sweetwater.)

[5] Drilling Information, Inc. (DI). 2013. DI Desktop. 2013 Production Information Database. We thank Environmental Defense Fund for providing this data.

[6] We used data obtained from the Office of Natural Resources Revenue on oil and gas production on federal and mixed leases for the counties that make up these 4 basins. Wells on tribal lands are not included.

[7] See http://www.eia.gov/analysis/requests/federallands/pdf/eia-federallandsales.pdf, page 9.

[8] About a quarter of oil production in Utah is from Tribal lands (see http://www.eia.gov/state/analysis.cfm?sid=UT), and the Uinta basin dominates oil production in Utah. Given that 44% of production in the Uinta is from Federal lands / minerals, and ~25% is from Tribal lands, roughly 69% of oil production in the basin is from BLM-regulated wells.

TABLE 4

(2013)	Oil Production (MBbl)			Gas Production (MMcf)		
	Total Basin	Federal Land in Basin	Percent of Basin Oil Production on Federal Land	Total Basin	Federal Land in Basin	Percent of Basin Gas Production on Federal Land
Green River Basin	14,031	12,183	87%	1,374	1,238	90%
Piceance Basin	6,873	5,770	84%	746	509	68%
San Juan Basin	3,567	2,403	67%	1,104	787	71%
Uinta Basin	26,733	11,704	44% [a]	437	357	82%
Total for 4 Basins	51,204	32,059	63%	3,661	2,891	79%

[a] This figure does not include production on Tribal lands. As discussed above, roughly a quarter of oil production in the Uinta basin is from Tribal land, so the portion of oil production in the Uinta basin originating from wells regulated by BLM probably approaches 70%.

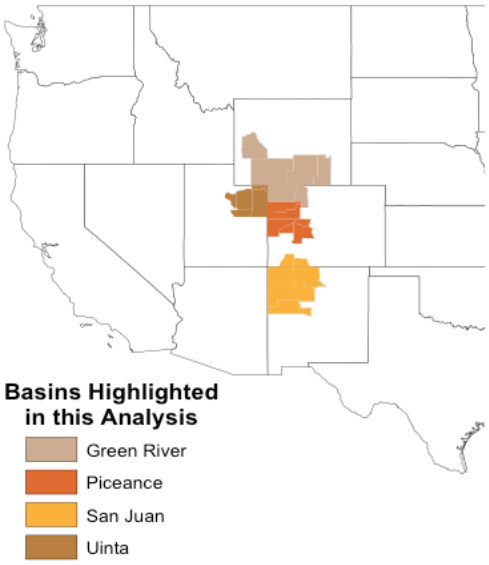
These four basins account for 57 percent of all Federally managed natural gas production (Table 5), indicating that these basins where wasteful practice is ubiquitous constitute a large portion of BLM-overseen natural gas production.

TABLE 5

(2013)	Oil Production (MBbl)	Gas Production (Bcf)
4 basins	51,204	3,661
Federal minerals in 4 basins	32,059	2,891
Total Onshore Federal minerals	265,376	5,042
Total Onshore US	2,082,390	27,217

III. Description of Methodology

As described in our May 30, 3014 comments, we tabulated emissions from four American Association of Petroleum Geologists (AAPG) oil and gas production basins in which a large percentages of wells are overseen by BLM (see below): Green River, Uinta, San Juan, and Piceance. Based on the data from the Drilling Info database reported for 2013,[9] production in 2013 in these four basins made up 13% and 2% of total U.S. gas and oil production, respectively.



[9] Production data for AAPG basins was compiled from county-level data from the Drilling Info "DI Desktop" database. Drilling Information, Inc. (DI). 2013. DI Desktop. 2013 Production Information Database. We thank Environmental Defense Fund for providing this data.

TABLE 6

Oil & Gas Producing Basin	Gas Production (BCF)	Percent of U.S. Gas Production	Oil / Liquids (MBbl)	Percent of U.S. Oil Production
Green River Basin	1,374	5.0%	14,031	0.7%
Uinta Basin	746	2.7%	6,873	0.3%
San Juan Basin	1,104	4.1%	3,567	0.2%
Piceance Basin	437	1.6%	26,733	1.3%
Total for 4 Basins	3,661	13.4%	51,204	2.4%
Total in U.S.	27,217		2,082,390	

Source: DI Desktop database.

To tabulate reported overall and individual source type emissions from these AAPG basins, we accessed GHGRP data using the EPA's Envirofacts website.[10] From that site, data from "Petroleum and Natural Gas Systems" (Subpart W) reported by individual facilities, tagged by emissions source (*e.g.*, pneumatic controllers) and greenhouse gas (*e.g.*, methane, CO_2) is available. We sorted facilities into AAPG basins by cross-referencing this data with the "Onshore Oil and Gas" facility information in EPA's summary spreadsheet of greenhouse gas emitters.[11] Only methane emissions are included in this analysis. We then converted the emissions data downloaded from the GHGRP in units of metric tons of CO_2e to metric tons of methane by dividing by 25, the global warming potential (GWP) used for 2013 Subpart W data. Next, we converted these data to natural gas volumes (MMCF, BCF, etc.) by assuming that the natural gas is 78 percent methane by volume[12] and carrying out standard conversions. The results are shown in Table 7, below.

TABLE 7

Specific Emissions Source	Methane Waste (MMcf)	Percentage of Nationwide Emissions for Specific Emission Source
Liquids Unloading	6,345	54%
Pneumatics	24,062	33%
Controllers	21,771	34%
Pumps	2,291	28%
Compressors	711	39%
Reciprocating	87	29%
Centrifugal	624	41%
Fugitives/Leaks	5,103	22%
Total for 4 Basins	38,106	29.6%
Total in U.S.	128,865	

As discussed in the previous section, not all of the oil and gas wells in these basins are located on federal land, and we are not able to directly apportion emissions from those

[10] Website address: http://www.epa.gov/enviro/facts/ghg/customized.html.
[11] Available here: http://www.epa.gov/ghgreporting/documents/xls/ghgp_data_2013-FINAL-8-18-14.xlsx.
[12] Based on 2013 data for Rocky Mountain NEMS region as reported in US EPA (2015), Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013, Annex 3, at Table A-139, available at: http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Annex-3-Additional-Source-or-Sink-Categories.pdf.

basins to wells on or off Federal land. However, given the very high percentage of wells within these basins that are Federal (see previous section) and the striking contrast between these basins and other basins nationwide, it is clear that the facilities on Federal land are contributing to the excessive methane emissions that are visible in the basin-level emissions data, and that these emissions are associated with natural gas waste.

We also note that not all methane emissions from oil and gas production facilities are reported to the GHGRP, due to limitations such as a reporting threshold that exempts smaller operators. As stated in our May 2014 comments, there are also limitations on the accuracy of the GHGRP data (such as the use of average leak emissions per component instead of measured leak emissions, and the omission of oil well completion emissions in current GHGRP data). However, we are unaware of any reason why these limitations of the GHGRP data would skew the comparisons of GHGRP data for these basins and the U.S. as a whole that we present in our comments. While the precision of our calculated results is limited by the limitations of the GHGRP, the dramatically higher rate of emissions in these basins clearly indicates that wasteful practices are common at wells overseen by BLM, while the high volume of avoidable waste that we calculate clearly indicates that BLM has a significant opportunity to reduce emissions and conserve this natural resource.

In 2013, methane emissions from oil and gas operations in these four basins accounts for nearly 30 percent of total onshore oil and gas production methane emissions in the U.S (see Table 8). As described above, this is a strikingly and disproportionately high percentage of U.S. onshore oil and gas methane percentage, since these four basins only account for 2.4% and 13.4% of U.S. onshore oil and gas production, respectively.

TABLE 8

(2013)	Methane Emissions (MMcf)	Fraction of Reported U.S. Methane Loss
Green River Basin	6,928	5.4%
Uinta Basin	4,012	4.3%
San Juan Basin	21,637	16.8%
Piceance Basin	5,530	3.1%
Total for 4 Basins	38,106	29.6%
Total in U.S.	128,865	

IV. Conclusion

We hope that this new information will aid BLM in its continued work on the anticipated update to the natural gas waste regulations. As we have shown, the methane emissions associated with the waste of natural gas on federally managed lands are disproportionately high as compared to nationwide onshore oil and gas operations. This discrepancy is unnecessary because technologies and practices exist, today, to minimize these wasteful emissions. Requiring such technologies and practices will go far to ensure that all reasonable precautions are used to prevent such waste.

Please feel free to contact us if you have any questions on these supplemental comments.

Sincerely,

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