



ne noble energy Office of Management and Budget
 EPA GHG Mandatory Reporting Rule –Subpart W Discussion
 September 27, 2010

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 Subpart W Discussion

AGENDA

1. Subpart W Definition of Facility
2. Source Priorities and Relative Source Contributions
3. Cost of Rule Compliance
4. Implementation Schedule

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1. Subpart W Definition of Facility
 - ▲ EPA redefines the definition of facility for oil and gas operations to include all oil and gas operations and equipment under common ownership and control within a geographic basin (i.e. aggregation of all facilities within a basin).
 - ▲ Traditional definition well defined for all other regulations under CAA.
 - ▲ Redefinition is unnecessary, disproportionately singles out oil and gas industry and will create regulatory uncertainty.
 - ▲ Noble's proposed alternative: creating "*reporting areas*" and "*reporting thresholds*" does not change the definition of facility and captures the same level of GHG emissions as EPA's approach. These comments are consistent with API and AXPC comments.

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2. Source Priorities and Relative Source Contributions

- ▲ EPA has not followed its own "80/20" guidance for including emission sources. Thus, the rule includes reporting requirements for many sources that are insignificant to the U.S. onshore production GHG inventory and should be excluded from reporting. As EPA noted in the Subpart W Preamble:

"Typically, at petroleum and gas facilities, 80 percent or more of a facility's emissions come from approximately 10 percent of the emissions sources. EPA used this benchmark to reduce the number of emissions sources required for reporting while keeping the reporting burden to a minimum [emphasis added]."
- ▲ Rule includes very small and insignificant sources.
- ▲ Over estimated contributions from portable, non-owned/operated equipment Drilling rig engines.
- ▲ Noble recommends EPA limit reporting to sources constituting the top 80% of the GHG inventory.

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3. Cost of Rule Compliance

- ▲ Noble estimates \$8.50/tonne CO₂, EPA estimates \$0.18/tonne CO₂.
- ▲ Subpart W requires burdensome and costly analytical testing
 - Quarterly gas, field separator, condensate tank and produced water tank sampling (thousands of samples).
 - Three mode testing for very small compressors (cost and safety concerns).
 - No threshold for small locations (analytical testing is required for a 500 bbl/day battery or a 1 bbl/day battery).
- ▲ Non-owned/operated portable equipment (e.g. drilling rigs)

Rule requires for the first time under the CAA, an industry segment to include non-owned/operated equipment in inventory. There is expense and compliance risk associated with gathering this information (which the actual owner/operator may or may not provide). No other industry segment is subject to this burden. Man-power intensive, site specific requirements.
- ▲ Specific inventory counting of every field location's equipment components. (valves, flanges, pneumatic devices, connectors, pumps, gathering line distances)

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3. Cost of Rule Compliance

- ▲ No significance thresholds
 - No screening method for determining of applicability of small "facilities." (i.e. must conduct full emissions inventory of all equipment).
 - Even sources contributing less than 0.1% of EPA's 2006 oil and gas GHG inventory must be included (refer to Table 2 from Noble's submitted comments).
- ▲ Noble recommendations
 - Use best available methods, existing (simpler, more cost-effective) emission calculation methods and existing analytical data.
 - Define thresholds for insignificant sources and develop screening methods for identifying insignificant sources.
 - Develop screening methods for identifying facilities below reporting threshold.
 - Employ representative sampling, (e.g. of process gas, average component counts) rather than "every source" sampling
 - Reduced sampling frequency for invariant parameters. (e.g. gas composition is constant).
 - Eliminate requirement for non-owned/operated equipment.
 - Eliminate extraneous reporting requirements of limited utility.

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4. Implementation Schedule

- ▶ January 1, 2011 effective date is extremely aggressive for the large amount of new monitoring, recordkeeping and reporting requirements.
- ▶ Practical compliance in two months will be impossible.
EPA should adopt a safe harbor policy for the first two annual submissions by those reporting under Subpart W whereby the EPA will presume that the submissions and calculations are being reported honestly and accurately, and that any errors are inadvertent.
- ▶ Noble recommends
 - One year delay with focus on improving emission calculation methods during 2011.
 - At a minimum, allow use of “best available data” for first year.
 - Phased in approach focusing on the largest sources the first year.
 - Phase in smaller sources over the next three years.
 - Bi-annual reporting

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- ▶ EPA should not redefine the definition of facility for oil and gas operations and define reporting areas and reporting thresholds for capture of GHG emissions from oil and gas operations.
- ▶ EPA should follow their 80/20 rule and focus on sources constituting the top 80% of the US GHG inventory (i.e. remove insignificant emission sources).
- ▶ EPA should define insignificant reporting thresholds and screening methods for small sources and facilities which can be eliminated from the inventory.
- ▶ EPA should not require excessive “every-source, every-time” sampling and testing but should focus on existing, available data and allow source averaging (i.e. representative sampling) for like equipment operating within the same area. I.e., typical equipment counts, average gas and liquid analyses and emission factors should be allowed.
- ▶ EPA should delay implementation for one year, or at a minimum use best available data, and phase in reporting requirements over three years focusing on the largest sources year one and phasing in smaller sources over the next three years.
- ▶ What additional information can Noble provide to support rule development?

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Table 1. Estimated Noble Energy Cost to Comply with MRR Subpart W and Subpart C for Onshore Petroleum and Natural Gas Production Emission Sources.

Emission Source	% of US Inv. ^A	NE Costs (\$/tonne CO ₂ e) ^B		Notes
		Year 1	Year 2+	
Well Venting for Liquids Unloading [98.233(f)]	24%	\$11.00	\$9.00	C
Associated Gas Venting and Flaring [§98.233(m)]	12%	\$2.00	\$1.70	
Gas Well Venting During Unconventional Well Completions and Workovers [98.233(g)]	12%	\$1.20	\$0.51	
Gas-Fired Reciprocating IC Engines (Combustion)	11%	\$2.90	\$2.50	
External Combustion: Heaters, boilers	8.4%	\$3.70	\$2.10	D
Natural Gas Pneumatic Bleed Devices (High or Continuous) [98.233(a)]	6.9%	\$1.30	\$0.19	
Portable Combustion Sources (Drill Rigs) [§98.233(z)]	6.6%	ND	ND	
Natural Gas Pneumatic Bleed Devices (Low) [98.233(b)]	3.9%	\$2.60	\$0.37	
Dehydrator (glycol) Vent stacks [98.233(e)]	3.1%	\$12.00	\$10.00	
Components [§98.233(r)]	3.0%	\$17.00	\$2.401	
Produced Water Dissolved CO ₂ [§98.233(y)]	2.7%	\$21.00	\$18.00	E
Production Storage Tanks [98.233(j)]	2.2%	\$18.00	\$16.00	
Gathering Pipeline Fugitives [98.233(r)]	1.6%	\$46.00	\$6.60	
Reciprocating Compressor Rod Packing Vents (Blowdown Leak & Blowdown Vent (Unit Isolation Valve Leak) [§98.233(p)]	0.7%	\$43.00	\$24.00	
Coal Bed Methane (CBM) Produced Water Emissions [§98.233(r)]	0.7%	-	-	F
Natural Gas driven pneumatic pumps [98.233(c)]	0.6%	\$1.50	\$0.54	
Centrifugal Compressor Wet Seal Oil Degassing Vent [§98.233(o)]	0.1%	ND	ND	
Acid Gas Removal (AGR) Vent stacks [98.233(d)]	0.1%	\$49.00	\$7.40	
Gas Well Venting During Conventional Well Completions and Workovers [98.233(h)]	0.1%	ND	ND	
Dehydrator (Desiccant) Vent stacks [98.233(e)]	0.1%	ND	ND	
Hydrocarbon Liquids Dissolved CO ₂ [§98.233(x)]	0.0%	\$38,000.00	\$33,000.00	
EOR Injection Pump Blowdown [§98.233(w)]	0.0%	ND	ND	G
Well Testing Venting and Flaring [§98.233(l)]	0.0%	NA	NA	H
Flare Stacks [§98.233(n)]	0.0%	NA	NA	I
Gas Composition [§98.233(u)]		NA	NA	J
TOTAL	100.0%	\$8.50	\$5.90	

ND – data not available

NA – not applicable

- A. Estimated percent of US onshore production GHG inventory from Table 2.
- B. 2010 dollars. Data management, calculations, record-keeping, and reporting costs allocated to emission sources proportional to source emission estimation cost.
- C. Well Unloading emissions and compliance costs are expected to reduce as more plunger lift operations are automated and optimized.
- D. Based on simple “company records” including burner rating and estimated operating hours. Assumed that totalizing flowmeters will *not* be installed on all external combustion equipment.

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- E. Emission estimate based on engineering judgment and assumptions and additional data needed to refine estimate.
- F. Minimal compliance costs; emissions based on population emission factor and readily available production data.
- G. Based on docket data, 500,000 pumps would be needed to account for about 0.1% of sector GHG emissions.
- H. The majority of well tests are conducted while the wells are in operation and do not require flaring. Other well tests would be included in well completion and well workover estimates.
- I. Flare emission estimates included in other emission source specific estimates.
- J. Cost to collect and analyze gas samples included in Total but not included in costs for individual emission sources.

Table 2. Estimated 2006 US GHG Inventory for MRR Subpart W and Subpart C Onshore Petroleum and Natural Gas Production Emission Sources.

Emission Source	CO2e tonne/yr)	% of Inv	Cumm %	Notes
Well Venting for Liquids Unloading [98.233(f)]	48,000,000	24%	24%	
Associated Gas Venting and Flaring [§98.233(m)]	24,000,000	12%	36%	
Gas-Fired Reciprocating IC Engines (Combustion)	22,000,000	11%	48%	
External Combustion: Heaters, boilers	16,000,000	8.4%	56%	
Gas Well Venting During Unconventional Well Completions [98.233(g)]	16,000,000	8.0%	64%	
Natural Gas Pneumatic Bleed Devices (High or Continuous) [98.233(a)]	13,000,000	6.9%	71%	
Portable Combustion Sources (Drill Rigs) [§98.233(z)]	13,000,000	6.6%	77%	
Natural Gas Pneumatic Bleed Devices (Low) [98.233(b)]	7,700,000	3.9%	81%	
Gas Well Venting During Unconventional Well Workers [98.233(g)]	7,000,000	3.6%	85%	
Dehydrator (glycol) Vent stacks [98.233(e)]	6,100,000	3.1%	88%	
Components [§98.233(r)]	6,000,000	3.0%	91%	
Produced Water Dissolved CO2 [§98.233(y)]	5,400,000	2.7%	94%	A
Production Storage Tanks [98.233(j)]	4,400,000	2.2%	96%	
Gathering Pipeline Fugitives [§98.233(r)]	3,066,000	1.6%	98%	
Reciprocating Compressor Rod Packing Vents (Blowdown Leak & Blowdown Vent (Unit Isolation Valve Leak) [§98.233(p)]	1,423,000	0.7%	98%	
Coal Bed Methane (CBM) Produced Water Emissions [§98.233(r)]	1,400,000	0.7%	99%	
Natural Gas driven pneumatic pumps [98.233(c)]	1,100,000	0.6%	100%	
Centrifugal Compressor Wet Seal Oil Degassing [§98.233(o)]	190,000	0.1%	100%	
Acid Gas Removal (AGR) Vent stacks [98.233(d)]	150,000	0.1%	100%	
Gas Well Venting - Conventional Well Completions [98.233(h)]	130,000	0.1%	100%	
Dehydrator (Desiccant) Vent stacks [98.233(e)]	120,000	0.1%	100%	
Hydrocarbon Liquids Dissolved CO2 [§98.233(x)]	8,700	0.0%	100%	
Gas Well Venting - Conventional Well Workovers [98.233(h)]	6,700	0.0%	100%	
EOR Injection Pump Blowdown [§98.233(w)]	-	<0.1%	100%	B
Well Testing Venting and Flaring [§98.233(l)]	0	0.0%	100%	C
Flare Stacks [§98.233(n)]	-	-	100%	D
TOTAL	200,000,000	100.0%		

Comment [tpm1]: Using 80% rule these next five sources would not be considered significant sources based on available data. If retained in the rule simpler estimation methods should be used.

Comment [tpm2]: Next four sources less than 2% of inventory. Noble recommended that additional data be collected to fine tune estimates and determine if these are significant (i.e. in top 80%) sources. If this has not been done then available data indicate these are insignificant sources.

Comment [tpm3]: All emission sources below this line contribute about 0.1% or less to the inventory. These are insignificant sources.

- A. These emissions could be estimated by simulations of produced water tank emissions by E&P Tanks (as applicable) or other process simulators (e.g. HYSIS) using water samples collected for storage tanks.
- B. Based on docket data, 500,000 pumps would be needed to account for 0.1% of sector GHG emissions.
- C. The majority of well tests are conducted while the wells are in operation and do not require flaring. Other well tests would be included in well completion and well workover estimates.
- D. Flare emission estimates included in other emission source specific estimates.