

Supporting Information

Assessment of Methane Emissions from Oil and Gas Production Pads using Mobile Measurements

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Supplemental Information A

Table S1. Repeated sites summary statistics. Mean and 95 % confidence intervals were calculated using a non-parametric bootstrap.

Table S2. Results of multivariate linear regression.

Figure S1. CH₄ emitted as a percent of gas production versus oil production by basin.

Figure S2. Comparison of measured CH₄ emissions as a percent of gas production from Allen et al.,¹⁶ ERG¹⁵, and OTM 33A by basin. Values over 100 not shown. Whiskers extend to the largest measurement that is within 1.5 times the interquartile range (IQR). Means and 95 % confidence intervals are shown in black and were calculated using a non-parametric bootstrap

Figure S3. Gas production by basin and study.

Supplemental Information B

Video S1. Persistent low CH₄ emissions from a produced water tank at Site C.

Video S2. Tank on north side of Site I with CH₄ emissions > 5 g/s.

Video S3. Southern edge of Site I with CH₄ emissions < 1 g/s. Emissions may have originated from a source on the pad other than the flare shown in the video.

Video S4. Open thief hatch on a condensate tank at Site K on July 9, 2012 (1.81 g CH₄/s).

Video S5. Open thief hatch on a condensate tank at Site K on July 10, 2012 (11.3 g CH₄/s)

Video S6. Open thief hatch on a condensate tank at Site K on July 12, 2012 (1.69 g CH₄/s).

Video S7. Site K on July 17, 2012 thief hatch was closed, emissions from pressure relief device (2.81 g CH₄/s).

Supplemental Information A (Tables and Figures)

Table S1. Repeated sites summary statistics. Mean and 95 % confidence intervals were calculated using a non-parametric bootstrap.

Site	N	Mean	Lower CL	Upper CL	Minimum time between samples (days)	Maximum time between samples (days)
A	3	0.04	0.02	0.05	0	4
B	4	0.07	0.06	0.08	0	732
C	21	0.16	0.12	0.20	0	378
D	4	0.20	0.08	0.36	2	388
E	6	0.44	0.25	0.71	0	6
F	3	0.90	0.45	1.30	0	3
G	3	1.10	0.65	1.46	0	0
H	6	0.71	0.20	2.59	0	336
I	10	1.95	1.16	3.52	0	5

Table S2. Results of multivariate linear regression.

	Parameter Estimate	Standard Error	P-value
(Intercept)	-0.75	0.43	0.08
Log(Gas (Mscf/day))	0.25	0.06	0.00
Log(Oil (bbl/day))	-0.08	0.03	0.01
Age (years)	-0.01	0.01	0.42

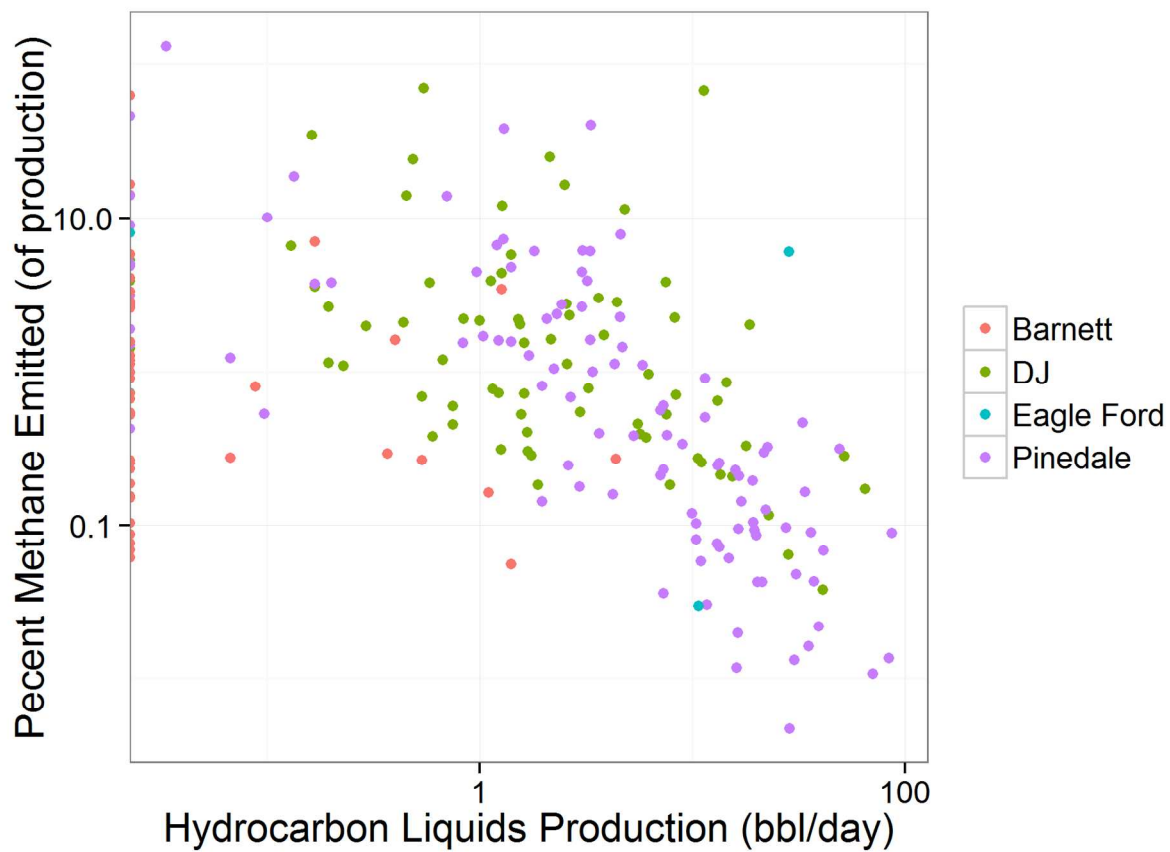


Figure S1. CH₄ emitted as a percent of gas production versus oil production by basin.

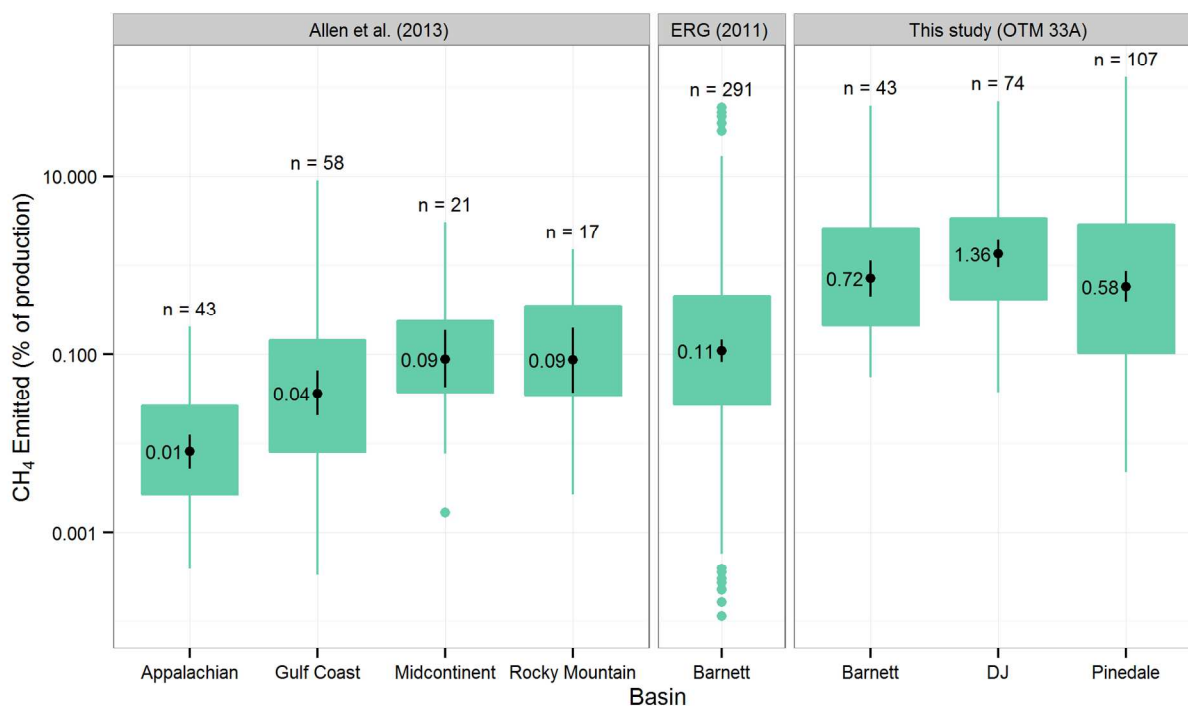


Figure S2. Comparison of measured CH₄ emissions as a percent of gas production from Allen et al.,¹⁶ ERG¹⁵, and OTM 33A by basin. Values over 100 not shown. Whiskers extend to the largest measurement that is within 1.5 times the interquartile range (IQR). Means and 95 % confidence intervals are shown in black and were calculated using a non-parametric bootstrap.

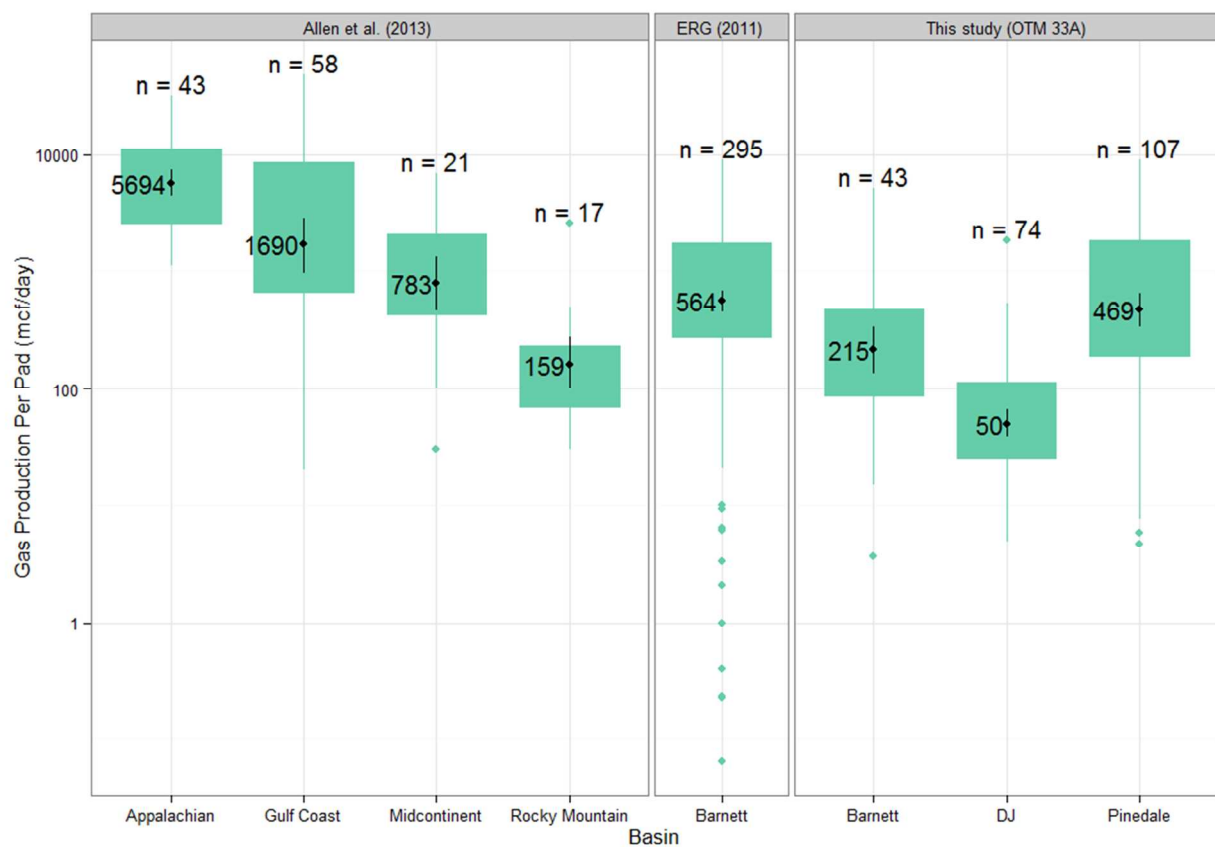


Figure S3. Gas production by basin and study.

Supplemental Information B (Infrared camera videos)



VID0015.wmv

Video S1. Persistent low CH₄ emissions from a produced water tank at Site C.



VID0059.wmv

Video S2. Tank on north side of Site I with CH₄ emissions > 5 g/s.



VID0047.wmv

Video S3. Southern edge of Site I with CH₄ emissions < 1 g/s. Emissions may have originated from a source on the pad other than the flare shown in the video.



VID0007.wmv

Video S4. Open thief hatch on a condensate tank at Site K on July 9, 2012 (1.81 g CH₄/s).



VID0008.wmv

Video S5. Open thief hatch on a condensate tank at Site K on July 10, 2012 (11.3 g CH₄/s).



VID0036.wmv

Video S6. Open thief hatch on a condensate tank at Site K on July 12, 2012 (1.69 g CH₄/s).



VID0065.wmv

Video S7. Site K on July 17, 2012 thief hatch was closed, emissions from pressure relief device (2.81 g CH₄/s).